Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

APPLE VALLEY ASSEMBLAGE
SOUTHWEST CORNER OF GUSTINE STREET
AND CENTRAL ROAD
APPLE VALLEY, CALIFORNIA

PREPARED FOR

LAKE CREEK INDUSTRIAL, LLC
1302 BRITTNAY CROSS ROAD
SANTA ANA, CA 92705

AUUGUST 3, 2022
REVISED JANUARY 31, 2023
REVISED SEPTEMBER 5, 2024

JOB NO. 4099

PREPARED BY

THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
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HYDROLOGY AND HYDRAULIC CALCULATIONS

FOR

APPLE VALLEY ASSEMBLAGE

PREPARED BY UNDER
THE SUPERVISION OF

REINHARD STENZEL DATE:
R.C.E. 56155
EXP. 12/31/24

INTRODUCTION

A: PROJECT LOCATION

The project site is located between Gustine Road and Corwin Road, west of Central Road and east of the Apple Valley Airport in the City of Apple Valley, California. Please see following page for vicinity map.

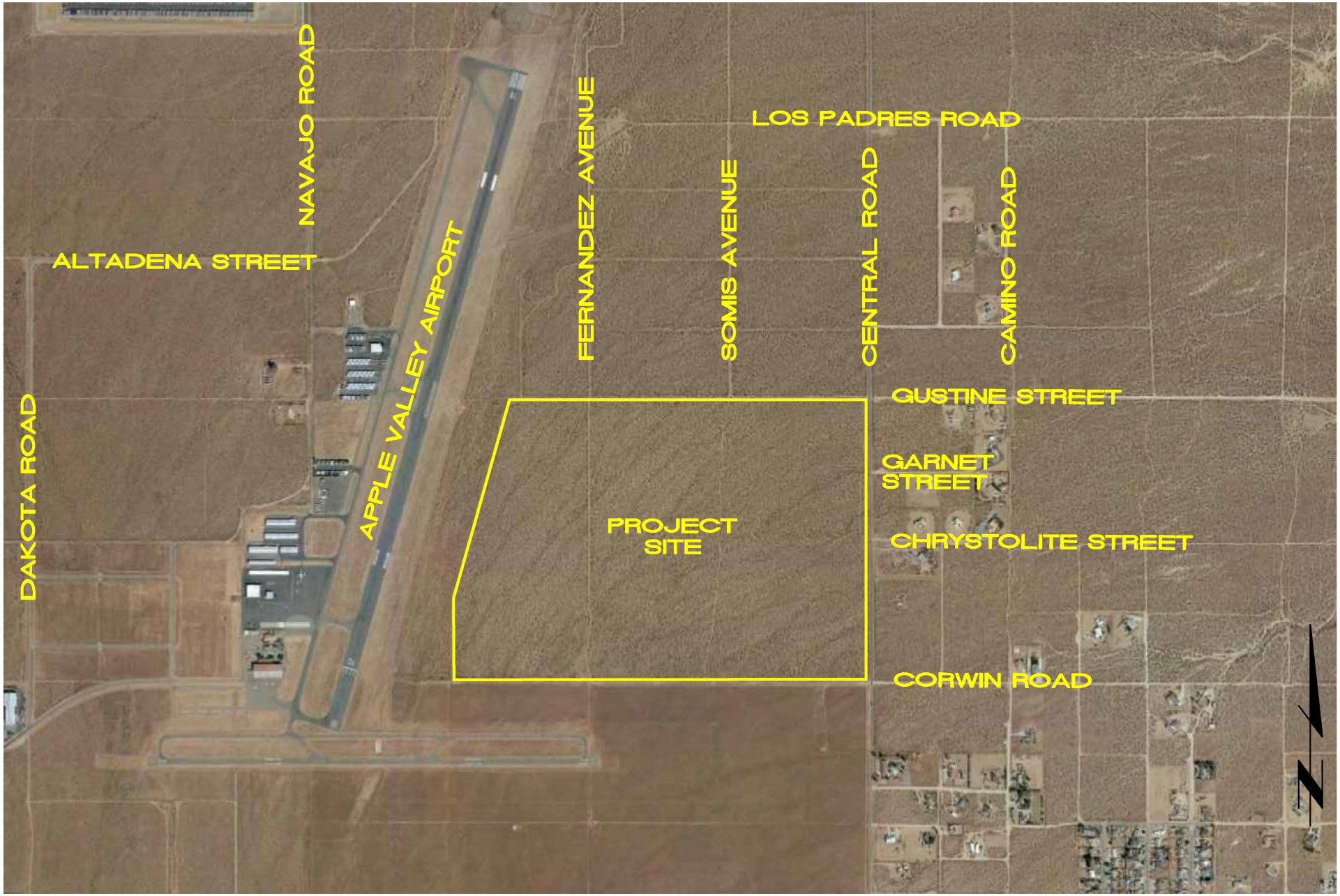
B: STUDY PURPOSE

The purpose of this study is to determine the 100-year existing condition and proposed condition discharges from the project site.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Mark Benavides



Last Update:10/18/21
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"VICINITY MAP"

FOR

APPLE VALLEY ASSEMBLAGE

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DISCUSSION

Project Description

The project site encompasses approximately 224.90 acres. Improvements to the site include three (3) warehouse type buildings that are approximately 1,238,320 (building 1), 1,169,680 (building 2), and 931,660 (building 3) square feet. There will be truck yards on the west and east sides of the proposed buildings. Vehicle parking will be on the north and south sides of the proposed buildings. A trailer yard will be at the north side of Building 3 just north of vehicle parking. Proposed channel will be at the north, east, and south perimeter of site. Proposed detention basins will be located at the southerly areas of Buildings 1 & 2, and at the southwesterly corner of Building 3. Proposed landscaping will be adjacent to the street and located throughout the site.

Master Plan of Drainage

The SBCFCD Apple Valley Master Plan of Drainage prepared by Williamson & Schmid shows the project site is tabled to N-02-02 with a 25-year peak flow rate of up to 580 cfs. In its ultimate condition, will be an 81-inch RCP.

There is a large existing earthen channel (N-02) running southwesterly adjacent to the Apple Valley Airport located at the west side of the project site. N-02 is tabled to receive runoff from N-02-02 and carry a total 100-year peak flow of 4,547 cfs per Apple Valley Master Plan of Drainage Final Report Volume I & II prepared by Williamson & Schmid. In its ultimate condition, N-02 will be concrete trapezoidal channel.

The Master Plan also shows N-01, a future RCP channel located east of the project. The N-01 channel is designed to divert a large amount of drainage, coming from the mountain region, away from the site. This channel was never constructed, thus the reason why we created our own existing offsite analysis.

There is an additional Storm Water Master Plan for Apple Valley Airport prepared by C&S dated September 2012. This SWMP analyzes the airport drainage and offsite runon which eventually flows through our project site and into the earthen channel running parallel with airport. The hydrology work map shows drainage patterns similar to our offsite hydrology map analysis.

Please see Appendix “A” for Master Drainage Plan and other pertinent reference materials.

Existing Conditions

The project site consists of undeveloped barren land with multiple lots. The site generally surface drains to the southwest and discharges into an earthen channel on the south side of the project site. The small channel catches any runoff to the south and carries flows westerly where it discharges into the N-02 channel adjacent to the airport.

The existing condition 100-year peak flow rate from the project site is 284.9 cfs (Nodes 100-702). Therefore, the existing condition will be used as allowable peak flow in proposed condition. See existing peak flow table summary below:

Nodes	Peak Flow (cfs)	Time of Concentration (Tc)	Area (AC)
100-104	37.4 cfs	30.47 min.	32.3
200-204	39.7 cfs	31.16 min.	34.8
300-306	80.1 cfs	27.35 min.	63.9
400-405	69.5 cfs	27.92 min.	56.3
500-503	19.7 cfs	22.09 min.	13.5
600-603	22.3 cfs	21.68 min.	15.1
700-702	16.2 cfs	16.34 min.	9.0
Total	***284.9 cfs***	**-**	***224.9 AC***

Per the San Bernardino County Hydrology Manual Addendum ADD-1 (2012), AMC II for arid regions was used for hydrology calculations.

See Appendix "B" for existing condition hydrology calculations and Appendix "D" for existing condition hydrology map.

Off Site Run-on

Under existing conditions, the project site is currently accepting offsite flows from the adjacent properties in the northeast. Flows begin at the top of the mountain region to the east of the site and travel westerly via surface sheet flow downstream through open brush for approximately 8,800 ft. Flows eventually enter the site via surface flow. The existing condition 100-year peak flow rate from the neighboring property is 1250.3 cfs. See existing off site peak flow table summary below:

Nodes	Peak Flow (cfs)	Time of Concentration (Tc)	Area (AC)
100-108	213.6 cfs	30.32 min.	169.6
200-208	184.0 cfs	27.95 min.	138.4
300-306	161.2 cfs	24.13 min.	109.7
400-408	184.4 cfs	24.91 min.	129.2
500-508	507.1 cfs	20.84 min.	313.0
Total	***1250.3 cfs***	**-**	***859.9 AC***

Proposed channels located along the northerly and southerly property lines will convey offsite flows around the site. Both channels will mimic existing drainage patterns and ultimately spill over into the existing N-02 channel.

See Appendix "B" for proposed condition hydrology calculations and Appendix "D" for existing condition hydrology map.

Proposed Conditions

Drainage from all three buildings will be collected in catch basins throughout the site. Each building will have multiple storm drain systems which will discharge to detention basins. From the detention basins flows will discharge by gravity via separate storm drain system to an onsite channel where it will eventually spillover to the N-02 channel.

Building 1

Runoff from the northerly parking lot (nodes 500-501) are intercepted in catch basins at the southerly portion of the parking lot. A proposed storm drain, Line "E", conveys flow westerly around the building then southerly through the truck yard. Runoff from the westerly portion of the building and westerly truck yard (nodes 502-510) is intercepted by catch basins located in the truck yard and conveyed to Line "E" via several laterals. The storm drain continues south to Detention Basin #1.

Flow from the easterly half of the building, the easterly truck yard (nodes 600-611) is intercepted in catch basin in the easterly truck yard. A proposed storm drain, Line "F", conveys runoff southerly. The remaining vehicle parking at the southerly side of the building (nodes 612-613) also drains to Line "E", prior to discharging into Detention Basin #1.

The 100-year peak flow rate to this detention basin is approximately 157.9 cfs.

Building 2

Runoff from the northerly parking lot (nodes 400-404) are intercepted in catch basins at the southerly portion of the parking lot. A proposed storm drain, Line "D", conveys flow easterly around the building then southerly through the truck yard. Runoff from the northeasterly ramp, easterly portion of the building and easterly truck yard (nodes 410-421) is intercepted by catch basins located in the truck yard and conveyed to Line "D" via several laterals. Line "D" will continue south around the building then westerly where it will pick up flows from all the vehicle parking lots via several laterals. The storm drain will discharge into Detention Basin #2.

The 100-year peak flow rate to detention basin # 2 is approximately 111.2 cfs.

Flows from the westerly half of the building, the westerly truck yard (nodes 300-306) is intercepted in catch basin in the westerly truck yard. A proposed storm drain, Line "C", conveys runoff southerly. The storm drain will continue south where it will discharge into Detention Basin #3.

The 100-year peak flow rate to detention basin # 3 is approximately 73.4 cfs.

Building 3

Runoff from the northerly parking lots (nodes 100-104) are intercepted in catch basins at the southerly portion of each parking lot. A proposed storm drain, Line "A", conveys flow westerly around the building then southerly through the truck yard. Runoff from the northwesterly ramp, westerly portion of the building and westerly truck yard (nodes 105-110) is intercepted by catch basins located in the truck yard and conveyed to Line "A" via several laterals. Line "A" will continue south through the truck yard then westerly where it will discharge into Detention Basin #1.

Flow from the ramp at the northeast of the building, easterly half of the building, and the easterly truck yard (nodes 200-210) is intercepted in catch basin in the easterly truck yard. A proposed storm drain, Line "B", conveys runoff southerly. Line "B" continues south then turn west around the building collecting flows from the southerly parking lots via several laterals. The storm drain will continue west where it will discharge into Detention Basin #4.

The 100-year peak flow rate to detention basin # 4 is approximately 135.2 cfs.

Driveways

Runoff for the southwesterly driveway for building 3 will surface flow south into Line "P" via catch basin where they will discharge into the south channel.

The proposed condition 100-year peak flow rate is 0.9 cfs (Nodes 1000-1001).

Runoff for the southeasterly driveway for building 3 will surface flow south into Line "G" via catch basin where they will discharge into the south channel.

The proposed condition 100-year peak flow rate is 1.2 cfs (Nodes 700-701).

Runoff for the southwesterly driveway for building 2 will surface flow south into Line "H" via catch basin where they will discharge into the south channel.

The proposed condition 100-year peak flow rate is 1.8 cfs (Nodes 800-801).

Runoff for the southeasterly driveway for building 2 will surface flow south into Line "J" via catch basin where they will discharge into the south channel.

The proposed condition 100-year peak flow rate for Line J is 1.0 cfs (Nodes 900-901).

See table summary on next page for proposed condition grand total.

Nodes	Peak Flow (cfs)	Time of Concentration (Tc)	Area (AC)
100-213	135.2 cfs	12.11 min.	60.7
300-307	73.4 cfs	11.75 min.	29.8
400-413	111.2 cfs	10.13 min.	45.4
500-613	157.9 cfs	10.70 min.	66.0
700-701	1.2 cfs	5.87 min.	0.3
800-801	1.8 cfs	6.67 min.	0.5
900-901	1.0 cfs	5.00 min.	0.2
1000-1001	0.9 cfs	5.00 min.	0.2
North Channel	-	-	6.4
South Channel	-	-	14.3
Driveway Ramps	-	-	1.1
Total	***482.6 cfs***	**-**	***224.9 AC***

See Appendix "B" for proposed condition hydrology calculations, Appendix "D" for proposed condition hydrology map.

Detention Basins Analysis

The proposed basins will have various size risers with available head to mitigate flow rates into proposed storm drain systems that will discharge into south channel. Hydrograph routings were analyzed for each basin. See basin table summary below.

Basin	Peak Flow (cfs)	Peak Flow (cfs) w/ Detention	Difference
#1	157.9 cfs	36.3 cfs	-121.6 cfs
#2	111.2 cfs	20.9 cfs	-90.3 cfs
#3	73.4 cfs	41.2 cfs	-32.2 cfs
#4	135.2 cfs	20.0 cfs	-115.2
Total	***477.7 cfs***	***118.4 cfs***	***-359.3 cfs***

See Appendix "C" for existing and proposed condition hydrographs and detention basin analysis.

Summary

The allowable Q for the site is 284.9 cfs to per existing condition. The proposed Q for the site without detention will be 482.6 cfs. With the proposed four detention basins, peak flow for the site will be 118.4 cfs + 4.9 cfs (driveways) = 123.3 cfs, therefore is less than existing condition.

Offsite runoff from adjacent properties will flow into perimeter channels (north and south) and will flow west into the earthen channel at the west side of the site mimicking drainage patterns of existing condition.

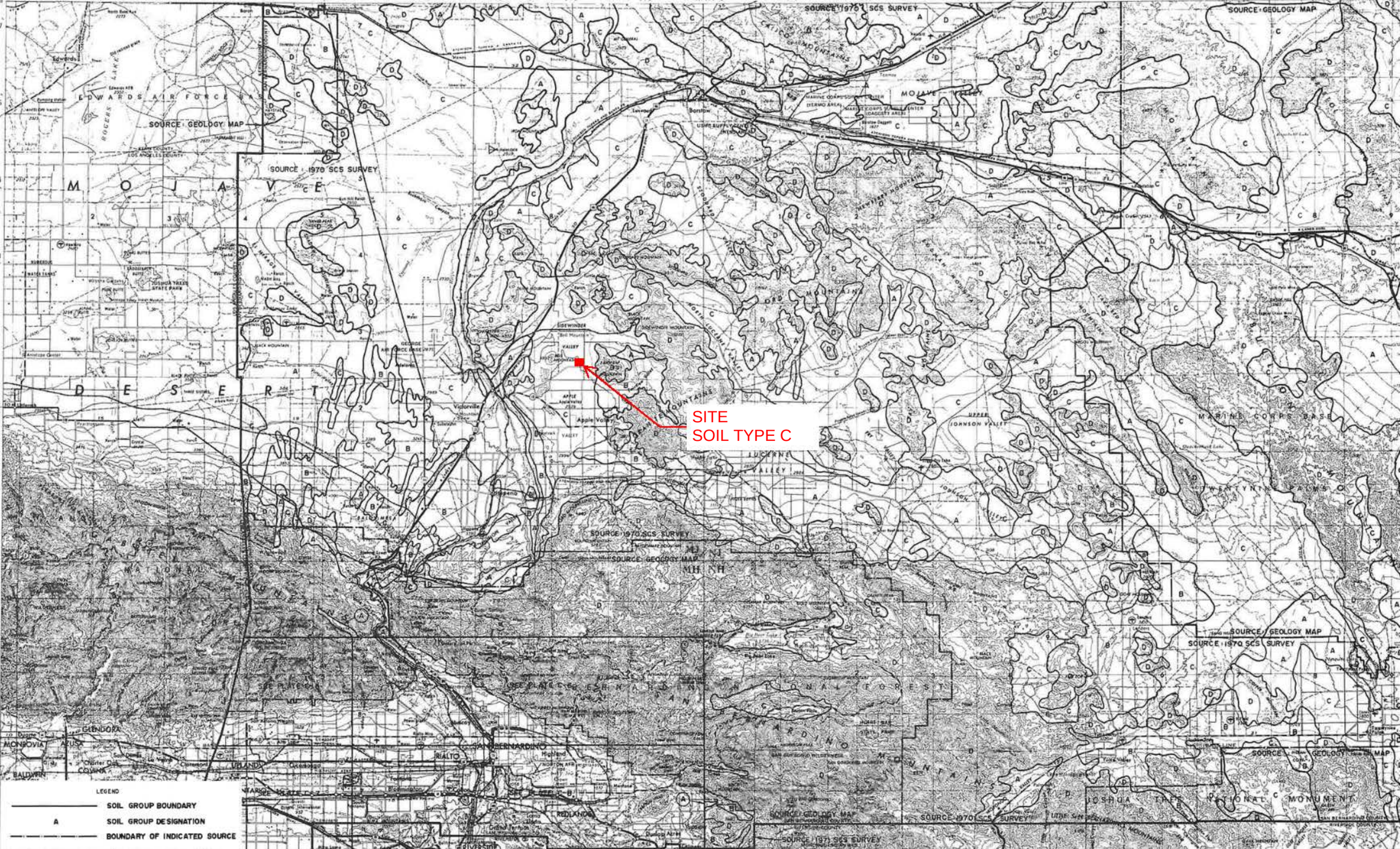
Methodology

The San Bernardino County Rational Method program (AES Software) was used for hydrology calculations. The site is composed of soil type "C" per the San Bernardino County Hydrology Manual. See Appendix "A" for pertinent reference materials. Per the San Bernardino County Hydrology Manual Addendum ADD-1 (2012), AMC II for arid regions was used for hydrology calculations.

APPENDIX	DESCRIPTION
A	REFERENCE MATERIAL
B	HYDROLOGY CALCULATIONS
C	HYDROGRAPH CALCULATIONS
D	HYDROLOGY MAPS

APPENDIX A

REFERENCE MATERIAL


SITE
SOIL TYPE C
SOURCE: 1970 SCS SURVEY
SOURCE: GEOLOGY MAP
EDWARDS AIR FORCE BASE
MOJAVE DESERT
MOJAVE VALLEY
MARINE CORPS BASE
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO MOUNTAINS
NATIONAL FOREST
Victorville
Apple Valley
Barstow
RIALTO
SAN BERNARDINO
REDLANDS
GLENDORA
MONROVIA
UPLAND
LEGEND
SOIL GROUP BOUNDARY
A SOIL GROUP DESIGNATION
BOUNDARY OF INDICATED SOURCE

NOAA Atlas 14, Volume 6, Version 2
Location name: Apple Valley, California, USA*
Latitude: 34.5771°, Longitude: -117.1778°
Elevation: 3027.59 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	0.080 (0.066-0.098)	0.113 (0.093-0.138)	0.159 (0.131-0.196)	0.199 (0.162-0.247)	0.257 (0.203-0.330)	0.305 (0.235-0.399)	0.356 (0.268-0.477)	0.412 (0.302-0.567)	0.492 (0.346-0.705)	0.558 (0.380-0.828)
10-min	0.114 (0.094-0.140)	0.162 (0.133-0.198)	0.228 (0.187-0.281)	0.286 (0.233-0.354)	0.369 (0.291-0.473)	0.437 (0.337-0.572)	0.510 (0.385-0.684)	0.590 (0.433-0.813)	0.705 (0.496-1.01)	0.799 (0.544-1.19)
15-min	0.138 (0.114-0.169)	0.196 (0.161-0.240)	0.276 (0.227-0.340)	0.345 (0.281-0.429)	0.446 (0.352-0.572)	0.529 (0.408-0.692)	0.617 (0.465-0.827)	0.713 (0.523-0.983)	0.852 (0.600-1.22)	0.967 (0.658-1.44)
30-min	0.188 (0.155-0.230)	0.266 (0.219-0.327)	0.376 (0.308-0.462)	0.470 (0.383-0.583)	0.607 (0.479-0.778)	0.719 (0.555-0.941)	0.840 (0.633-1.13)	0.971 (0.712-1.34)	1.16 (0.817-1.66)	1.32 (0.895-1.95)
60-min	0.235 (0.194-0.288)	0.333 (0.274-0.408)	0.470 (0.386-0.578)	0.588 (0.479-0.729)	0.759 (0.598-0.973)	0.900 (0.695-1.18)	1.05 (0.792-1.41)	1.21 (0.890-1.67)	1.45 (1.02-2.08)	1.65 (1.12-2.44)
2-hr	0.335 (0.276-0.410)	0.454 (0.374-0.557)	0.619 (0.508-0.762)	0.761 (0.619-0.944)	0.964 (0.759-1.24)	1.13 (0.871-1.48)	1.30 (0.982-1.75)	1.49 (1.09-2.05)	1.76 (1.24-2.53)	1.98 (1.35-2.94)
3-hr	0.407 (0.336-0.499)	0.544 (0.448-0.668)	0.733 (0.601-0.901)	0.893 (0.727-1.11)	1.12 (0.884-1.44)	1.31 (1.01-1.71)	1.50 (1.13-2.01)	1.71 (1.25-2.36)	2.01 (1.41-2.88)	2.25 (1.53-3.34)
6-hr	0.558 (0.460-0.684)	0.735 (0.605-0.903)	0.977 (0.802-1.20)	1.18 (0.962-1.47)	1.47 (1.16-1.88)	1.70 (1.31-2.22)	1.94 (1.46-2.60)	2.19 (1.61-3.02)	2.55 (1.80-3.66)	2.84 (1.93-4.22)
12-hr	0.722 (0.595-0.885)	0.952 (0.784-1.17)	1.26 (1.04-1.55)	1.52 (1.24-1.89)	1.89 (1.49-2.42)	2.17 (1.68-2.84)	2.47 (1.86-3.31)	2.78 (2.04-3.83)	3.21 (2.26-4.61)	3.56 (2.42-5.28)
24-hr	0.951 (0.844-1.09)	1.27 (1.12-1.46)	1.69 (1.49-1.95)	2.04 (1.79-2.38)	2.52 (2.14-3.04)	2.90 (2.41-3.56)	3.29 (2.66-4.14)	3.69 (2.91-4.78)	4.25 (3.21-5.74)	4.69 (3.43-6.55)
2-day	1.14 (1.01-1.31)	1.55 (1.37-1.78)	2.09 (1.84-2.41)	2.53 (2.21-2.94)	3.13 (2.65-3.77)	3.59 (2.98-4.42)	4.07 (3.30-5.12)	4.56 (3.59-5.91)	5.23 (3.96-7.06)	5.76 (4.20-8.04)
3-day	1.24 (1.10-1.43)	1.71 (1.51-1.97)	2.32 (2.05-2.68)	2.81 (2.47-3.28)	3.49 (2.96-4.20)	4.01 (3.33-4.93)	4.54 (3.68-5.72)	5.08 (4.01-6.58)	5.83 (4.41-7.87)	6.41 (4.68-8.95)
4-day	1.32 (1.17-1.52)	1.81 (1.61-2.09)	2.47 (2.18-2.85)	3.00 (2.63-3.50)	3.73 (3.16-4.48)	4.28 (3.55-5.26)	4.85 (3.93-6.10)	5.43 (4.28-7.03)	6.22 (4.70-8.40)	6.84 (4.99-9.55)
7-day	1.43 (1.27-1.65)	1.96 (1.73-2.26)	2.66 (2.35-3.07)	3.23 (2.83-3.76)	4.01 (3.40-4.83)	4.62 (3.84-5.68)	5.24 (4.25-6.60)	5.88 (4.63-7.62)	6.75 (5.11-9.12)	7.44 (5.43-10.4)
10-day	1.51 (1.34-1.74)	2.06 (1.82-2.37)	2.79 (2.47-3.23)	3.40 (2.98-3.96)	4.23 (3.58-5.09)	4.88 (4.05-5.99)	5.54 (4.49-6.97)	6.23 (4.91-8.06)	7.17 (5.42-9.68)	7.91 (5.78-11.1)
20-day	1.72 (1.52-1.98)	2.35 (2.08-2.71)	3.20 (2.83-3.70)	3.91 (3.43-4.56)	4.90 (4.15-5.90)	5.68 (4.71-6.98)	6.48 (5.25-8.16)	7.32 (5.77-9.48)	8.47 (6.41-11.4)	9.38 (6.85-13.1)
30-day	1.93 (1.72-2.23)	2.65 (2.35-3.06)	3.63 (3.21-4.19)	4.45 (3.90-5.18)	5.60 (4.75-6.74)	6.51 (5.41-8.00)	7.45 (6.04-9.39)	8.44 (6.65-10.9)	9.81 (7.42-13.2)	10.9 (7.95-15.2)
45-day	2.29 (2.03-2.64)	3.15 (2.79-3.63)	4.32 (3.82-4.99)	5.31 (4.66-6.19)	6.72 (5.70-8.09)	7.84 (6.51-9.64)	9.01 (7.30-11.3)	10.2 (8.07-13.3)	12.0 (9.04-16.1)	13.3 (9.72-18.6)
60-day	2.50 (2.22-2.87)	3.42 (3.03-3.94)	4.70 (4.15-5.42)	5.78 (5.07-6.73)	7.33 (6.21-8.82)	8.57 (7.12-10.5)	9.88 (8.01-12.4)	11.3 (8.88-14.6)	13.2 (9.98-17.8)	14.7 (10.8-20.6)

[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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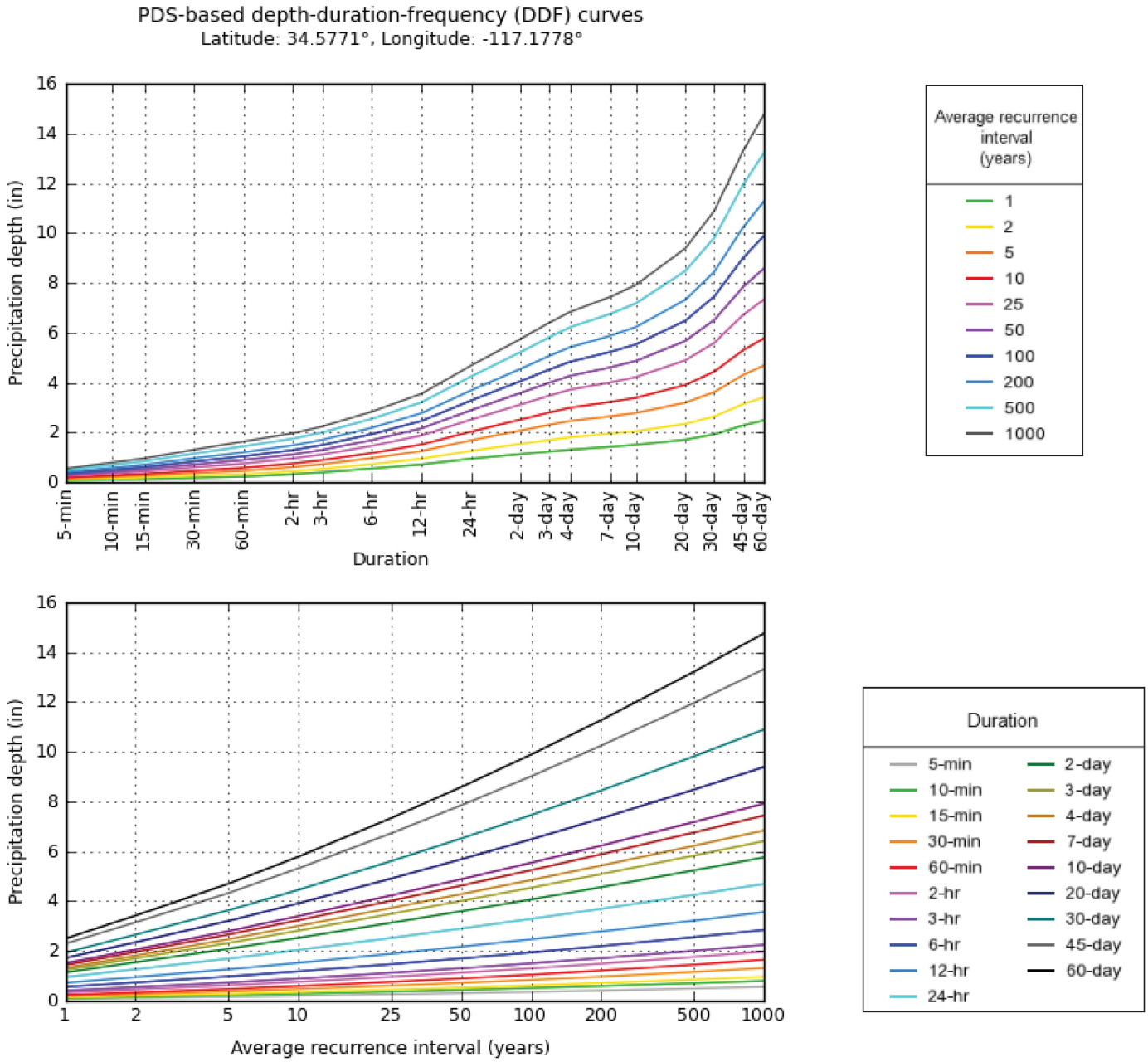
PF graphical



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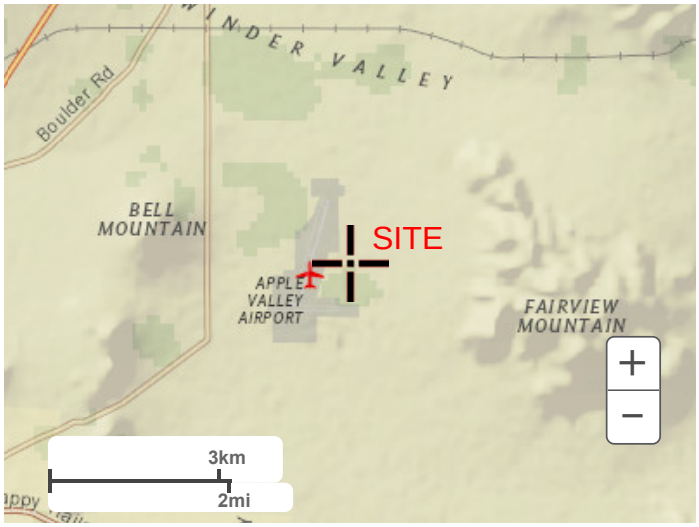
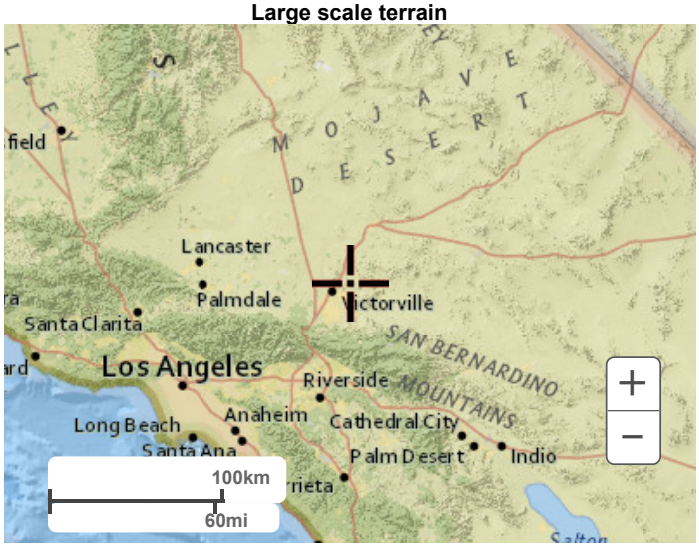
Maps & aerials

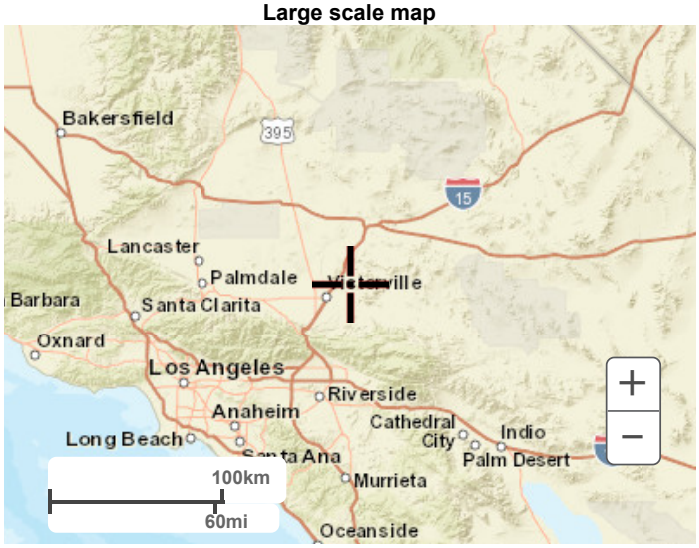
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

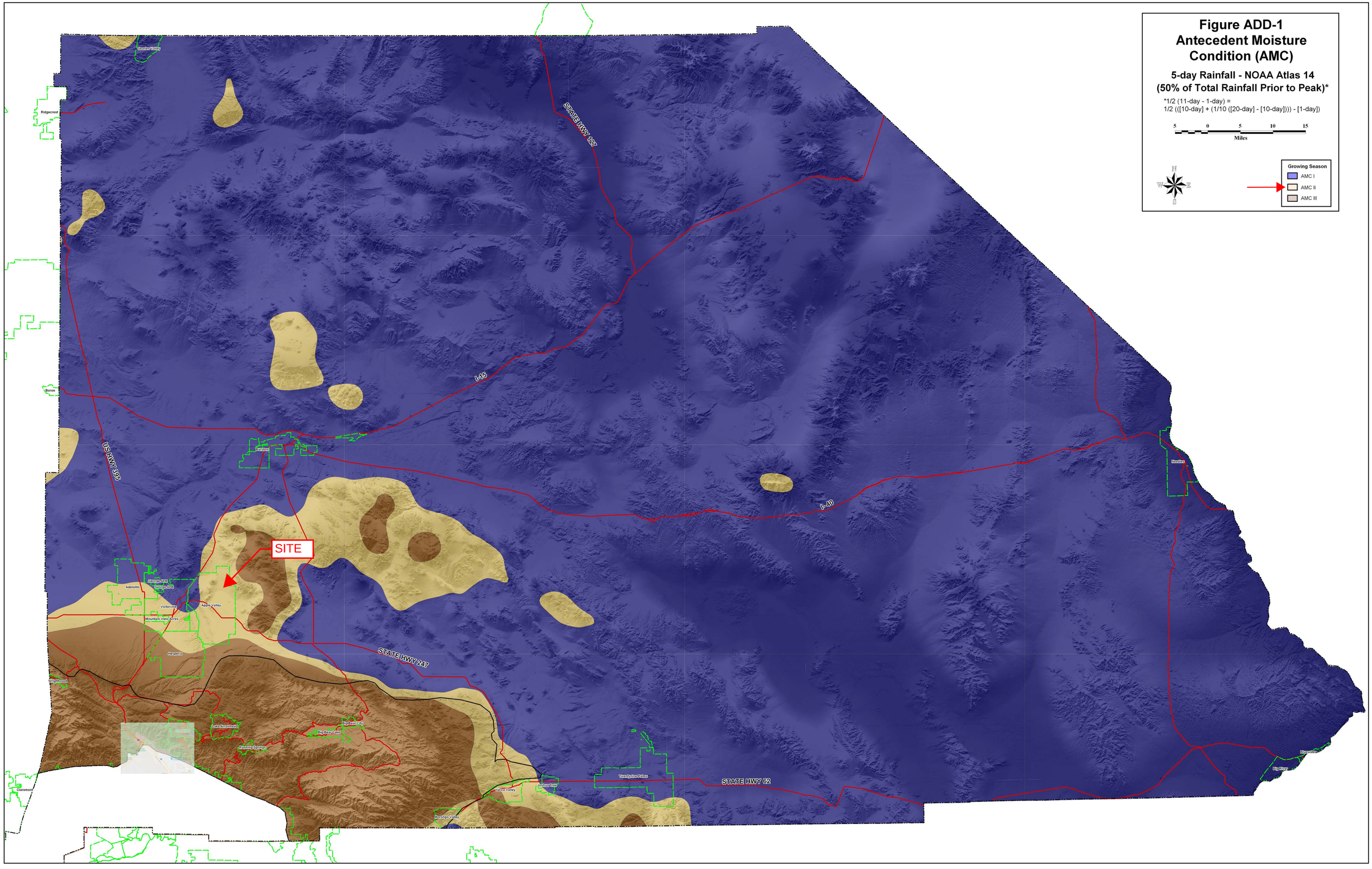
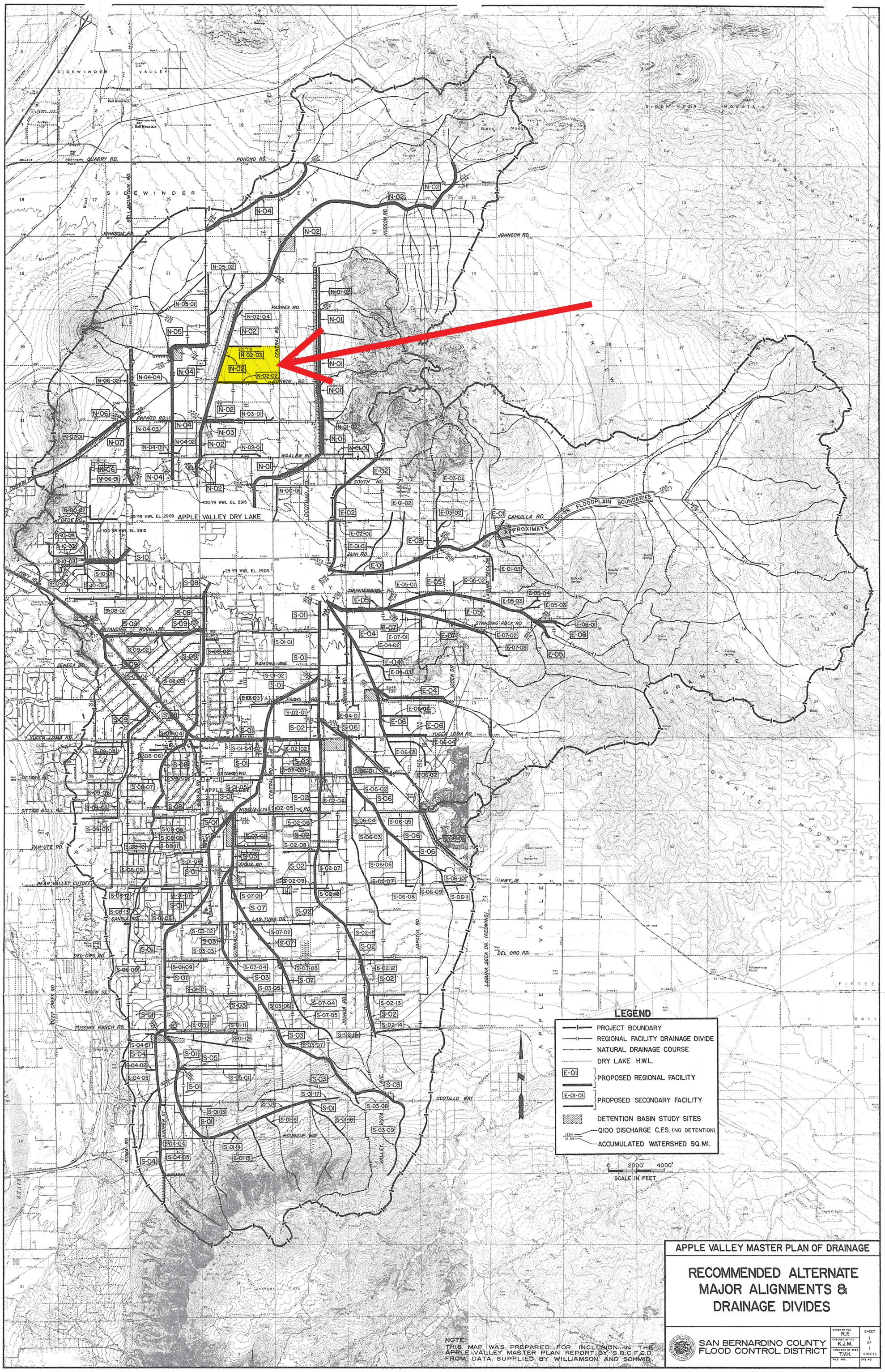


Figure ADD-1
Antecedent Moisture Condition (AMC)
5-day Rainfall - NOAA Atlas 14
(50% of Total Rainfall Prior to Peak)*
*1/2 (11-day - 1-day) =
1/2 (([10-day] + (1/10 ([20-day] - [10-day]))) - [1-day])
5 0 5 10 15
Miles
N
W
E
S
Growing Season
AMC I
AMC II
AMC III
SITE
STATE HWY 127
I-15
I-40
US HWY 395
STATE HWY 247
STATE HWY 62
Ridgecrest
Boron
Barstow
Needles
Adelanto
Victorville
Apple Valley
Hesperia
Wrightwood
Lake Arrowhead
Running Springs
Big Bear City
Big Bear Lake
Yucca Valley
Joshua Tree
Twentynine Palms
Morongo Valley
Claremont
Blythe
Big River


APPLE VALLEY MASTER PLAN OF DRAINAGE
RECOMMENDED ALTERNATE MAJOR ALIGNMENTS & DRAINAGE DIVIDES
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
DRAWN BY FCD R.F.
CHECKED BY FCD K.J.M.
CHECKED BY W&S T.V.H.
SHEET 1 OF 1 SHEETS
LEGEND
PROJECT BOUNDARY
REGIONAL FACILITY DRAINAGE DIVIDE
NATURAL DRAINAGE COURSE
DRY LAKE H.W.L.
E-01 PROPOSED REGIONAL FACILITY
E-01-01 PROPOSED SECONDARY FACILITY
DETENTION BASIN STUDY SITES
Q100 DISCHARGE C.F.S. (NO DETENTION)
ACCUMULATED WATERSHED SQ.MI.
0 2000' 4000'
SCALE IN FEET
APPROXIMATE 100-YR FLOODPLAIN BOUNDARIES
APPLE VALLEY DRY LAKE
100 YR HWL EL. 2915
25 YR HWL EL. 2909
SIDEWINDER VALLEY
SIDEWINDER MOUNTAIN
GRANITE MOUNTAINS
NOTE:
THIS MAP WAS PREPARED FOR INCLUSION IN THE APPLE VALLEY MASTER PLAN REPORT BY S.B.C.F.C.D. FROM DATA SUPPLIED BY WILLIAMSON AND SCHMID.

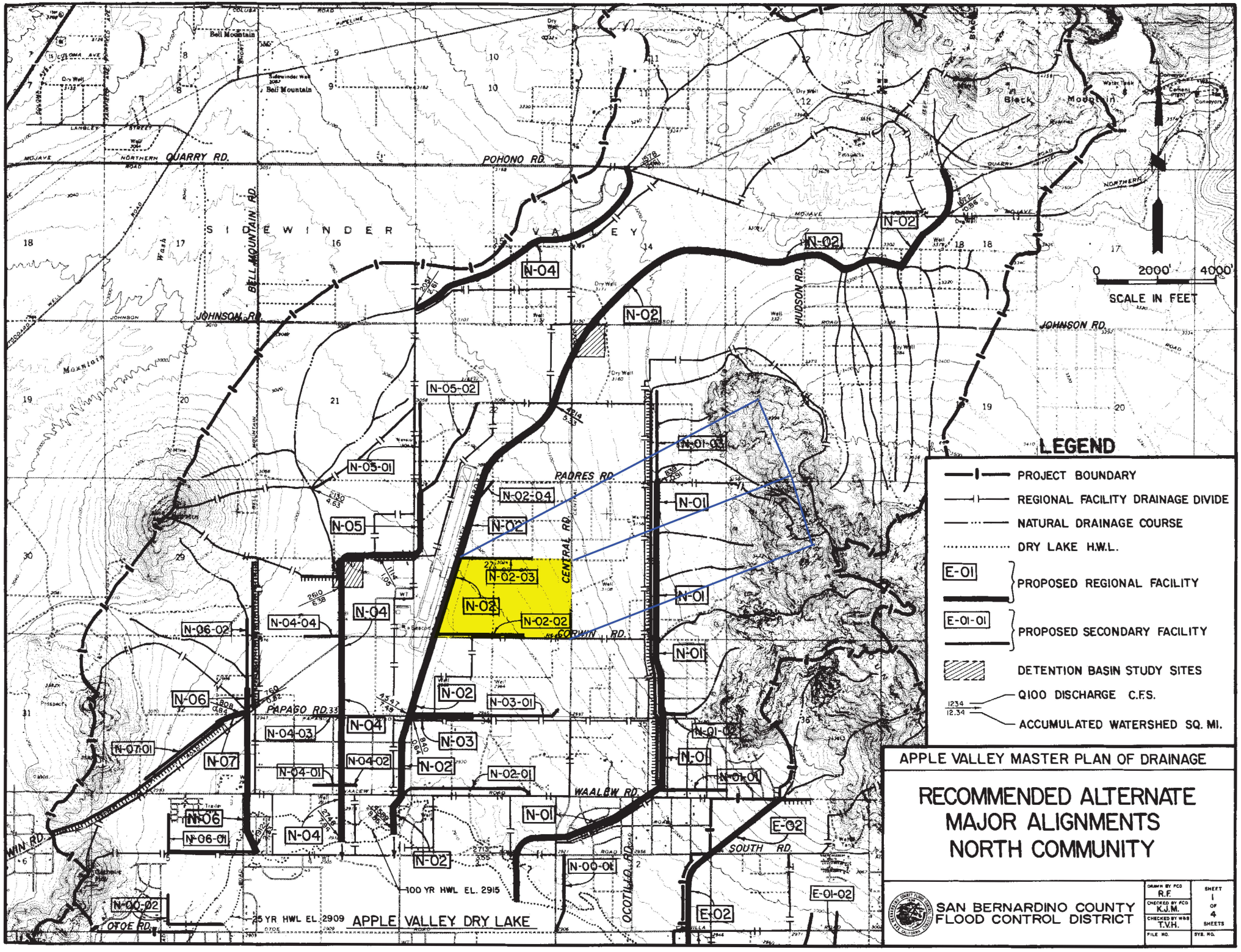
APPLE VALLEY MASTER PLAN OF DRAINAGE

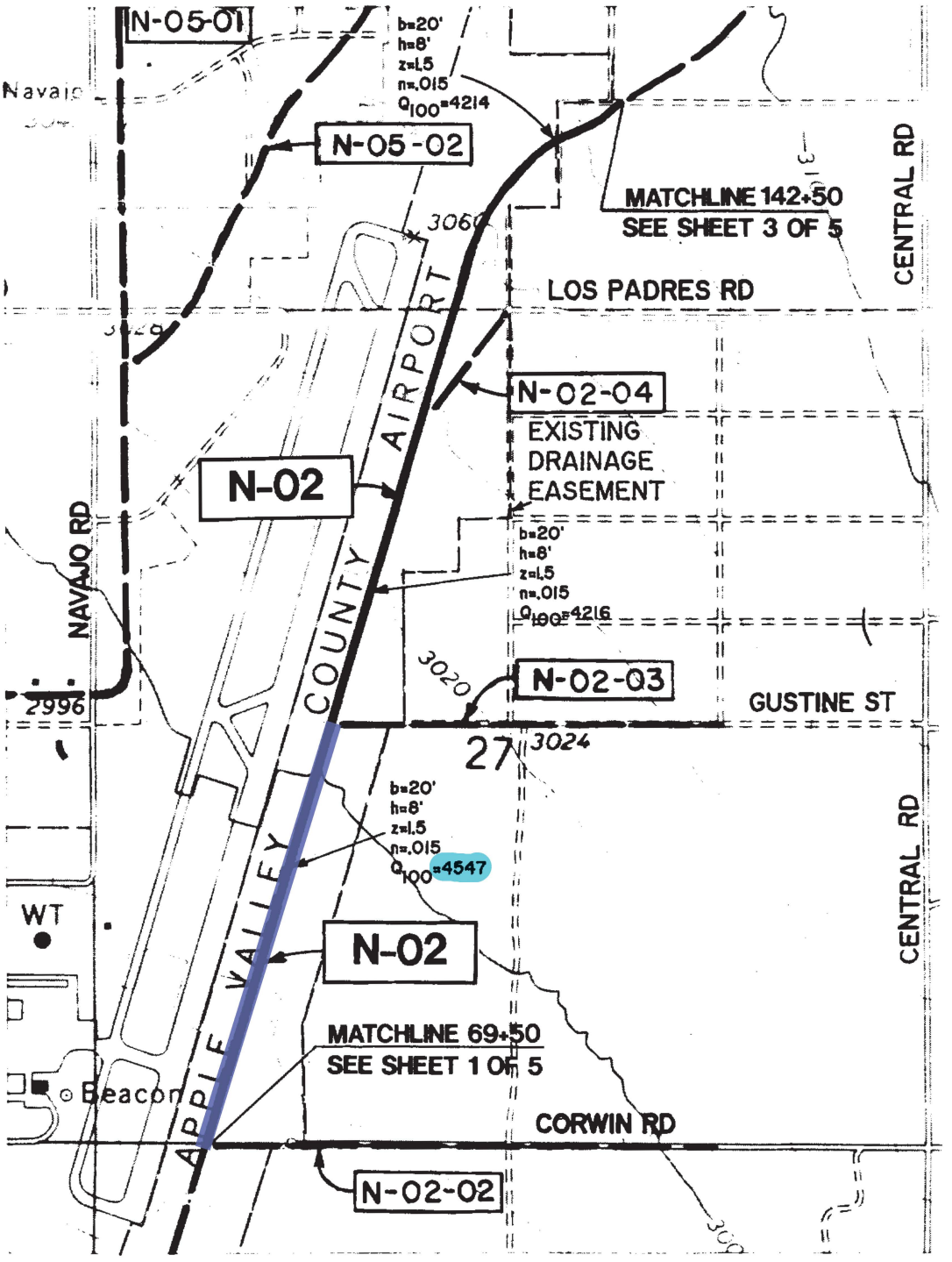
VOLUME I
FINAL REPORT

PREPARED BY

WILLIAMSON & SCHMID

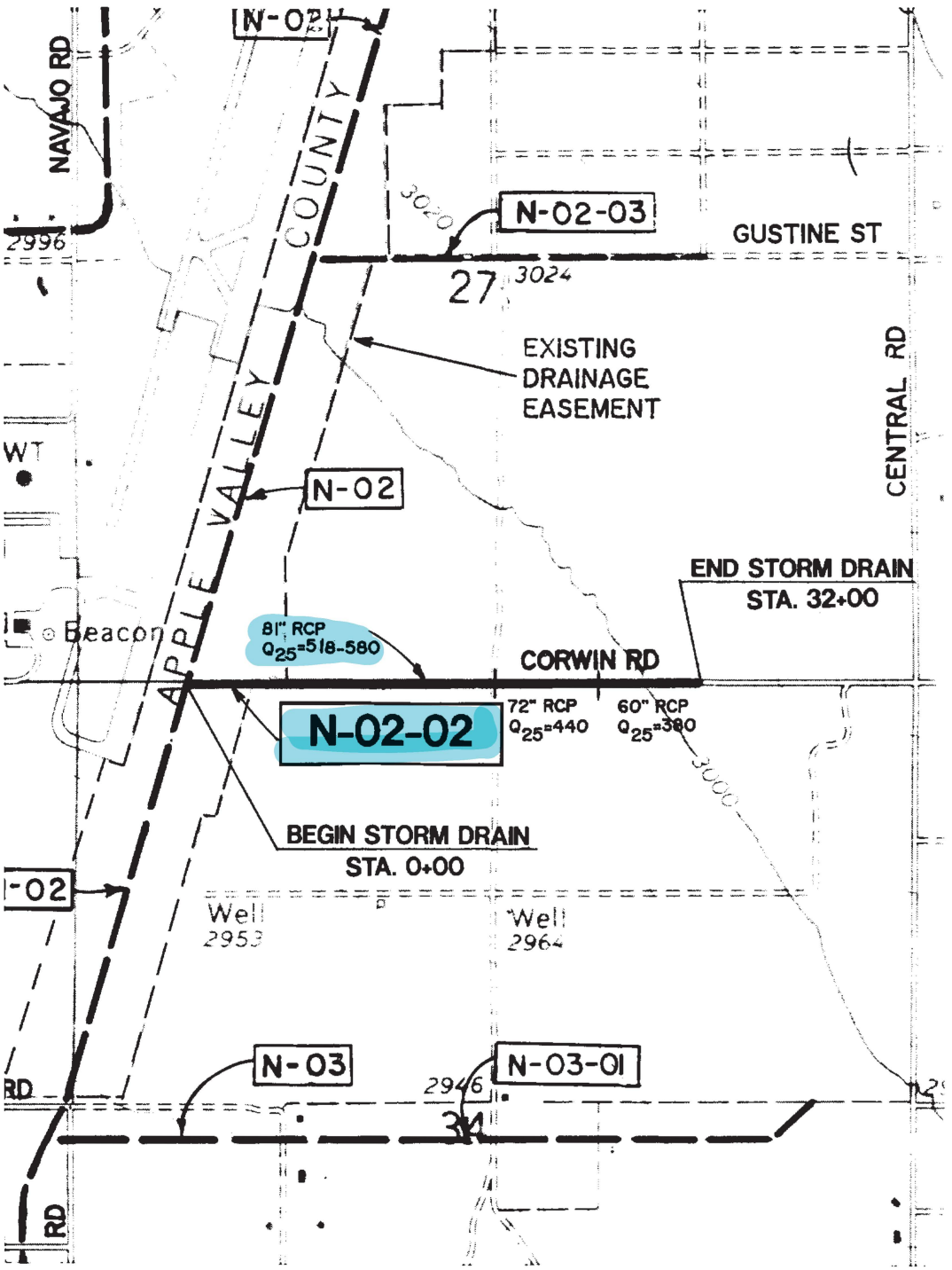
17782 SKY PARK BLVD., IRVINE, CA. 92714·(714)261-2222


QUARRY RD.
POHONO RD.
SIDEWINDER VALLEY
BELL MOUNTAIN RD.
JOHNSON RD.
HUDSON RD.
PADRES RD.
CENTRAL RD.
CORWIN RD.
PAPAGO RD.
WAALEW RD.
SOUTH RD.
OCOTILLO RD.
OTOE RD.
Bell Mountain
Black Mountain
N-02
N-04
N-05-02
N-05-01
N-05
N-02-04
N-02-03
N-02-02
N-01-03
N-01
N-04-04
N-06-02
N-06
N-03-01
N-03
N-04-03
N-04-02
N-04-01
N-02-01
N-07-01
N-07
N-06-01
N-00-01
N-00-02
E-02
E-01-02
100 YR HWL EL. 2915
25 YR HWL EL. 2909
APPLE VALLEY DRY LAKE
0 2000' 4000'
SCALE IN FEET
LEGEND
PROJECT BOUNDARY
REGIONAL FACILITY DRAINAGE DIVIDE
NATURAL DRAINAGE COURSE
DRY LAKE H.W.L.
E-01
PROPOSED REGIONAL FACILITY
E-01-01
PROPOSED SECONDARY FACILITY
DETENTION BASIN STUDY SITES
1234
Q100 DISCHARGE C.F.S.
12.34
ACCUMULATED WATERSHED SQ. MI.
APPLE VALLEY MASTER PLAN OF DRAINAGE
RECOMMENDED ALTERNATE
MAJOR ALIGNMENTS
NORTH COMMUNITY
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT
DRAWN BY FCD R.F.
CHECKED BY FCD K.J.M.
CHECKED BY WRD T.V.H.
FILE NO.
SHEET 1 OF 4 SHEETS
SYS. NO.



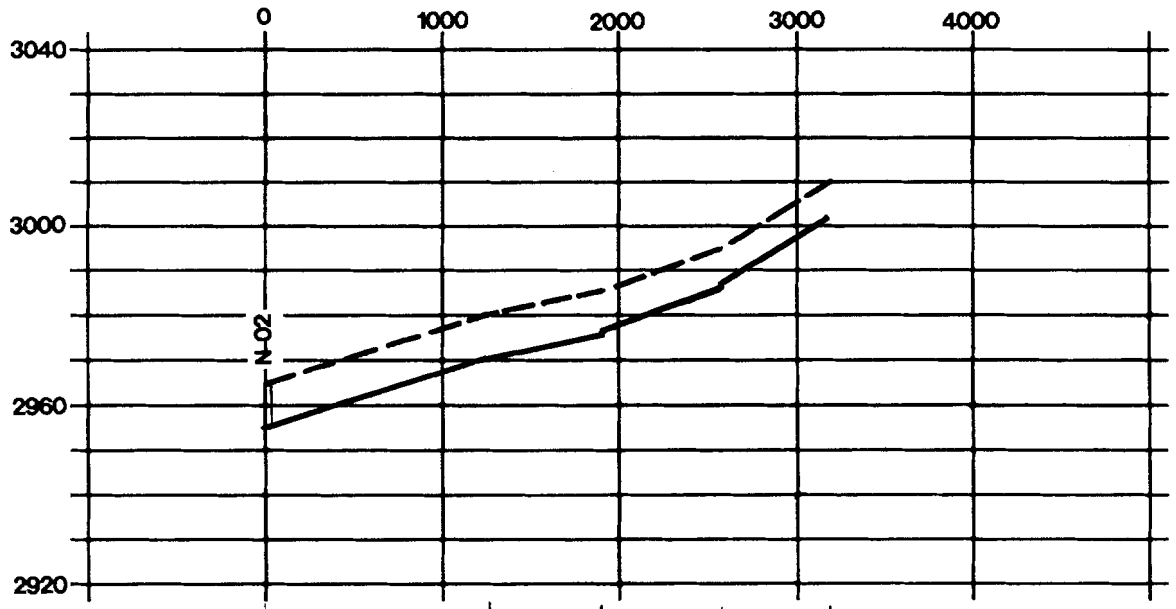
LEGEND			
	WATERSHED BOUNDARY		DRY LAKE H.W.L.
	PROPOSED FACILITY		LEVEE
	FACILITY SHOWN ELSEWHERE		N.D.C.

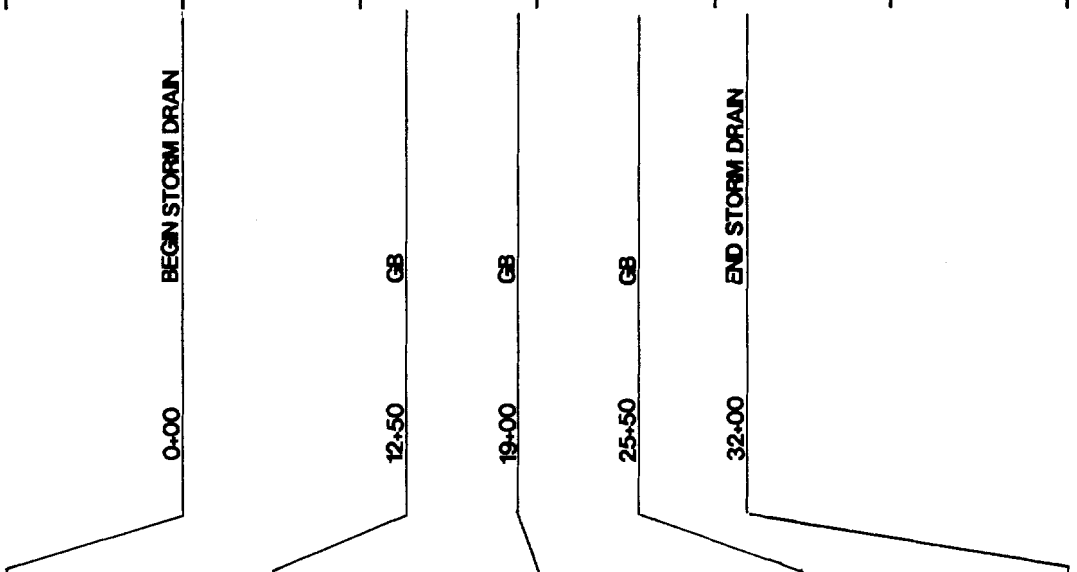
APPLE VALLEY MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE N-02 SHEET 2 OF 5	SCALE 1"=1000' WILLIAMSON & SCHMID



LEGEND			
	WATERSHED BOUNDARY		DRY LAKE H.W.L.
	PROPOSED FACILITY		LEVEE
	FACILITY SHOWN ELSEWHERE		N.D.C.

APPLE VALLEY MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE N-02-02 SHEET 1 OF 1	SCALE 1"=1000' WILLIAMSON & SCHMID





LENGTH	1250	650	650	650
SLOPE	.012	.009	.014	.023
FLOW	Q_{25}=580	Q_{25}=518	Q_{25}=440	Q_{25}=380
SIZE	81"		72"	60"
TYPE	RCP			

LEGEND

- - - - - - LEVEE
— — — NATURAL GROUND
——— PROPOSED FLOWLINE

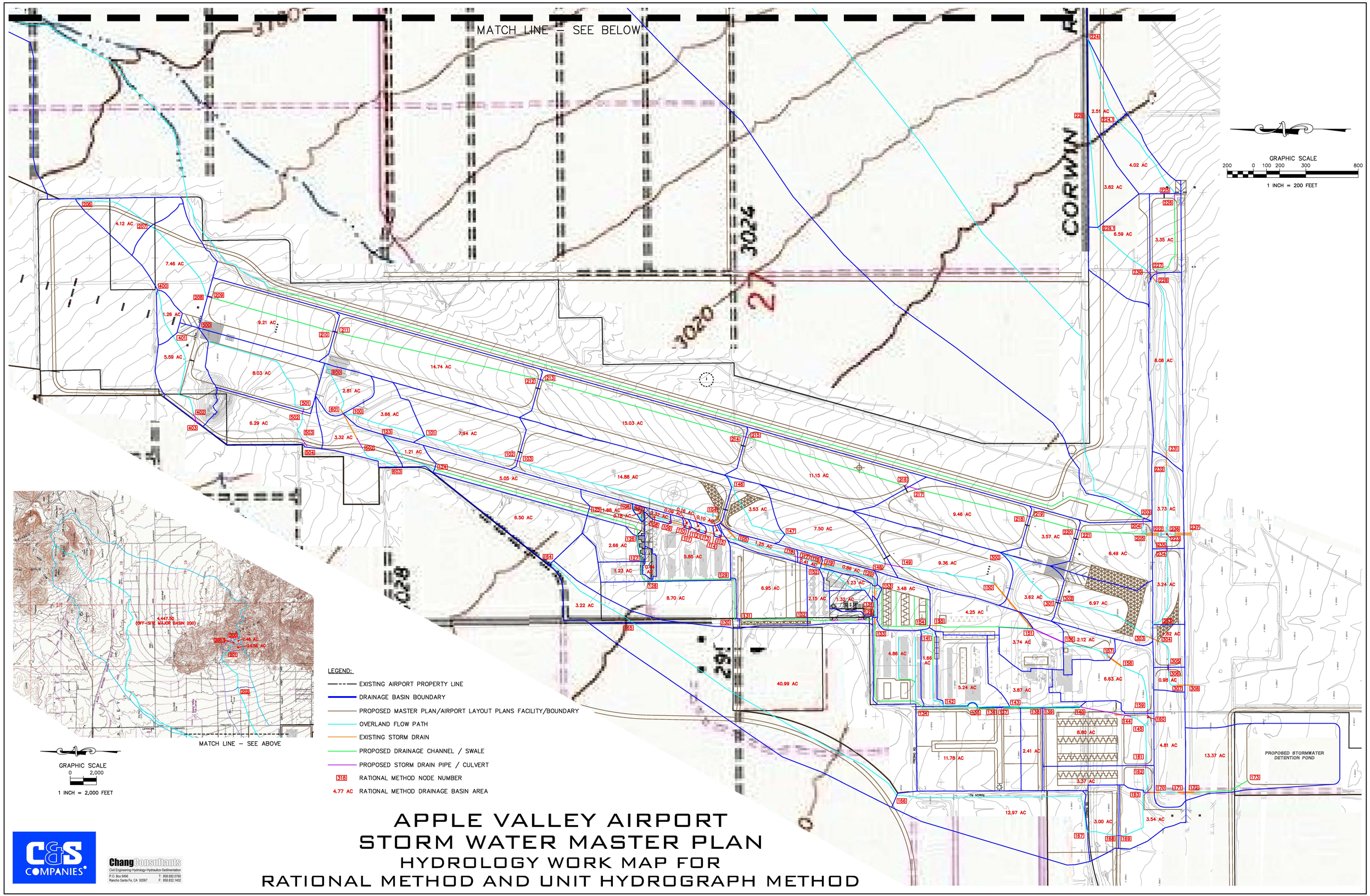
APPLE VALLEY MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE N-02-02 SHEET 1 OF 1	SCALE H: 1"=1000' V: 1"=40' WILLIAMSON & SCHMID

Storm Water Master Plan for Apple Valley Airport

September 2012

Submitted by

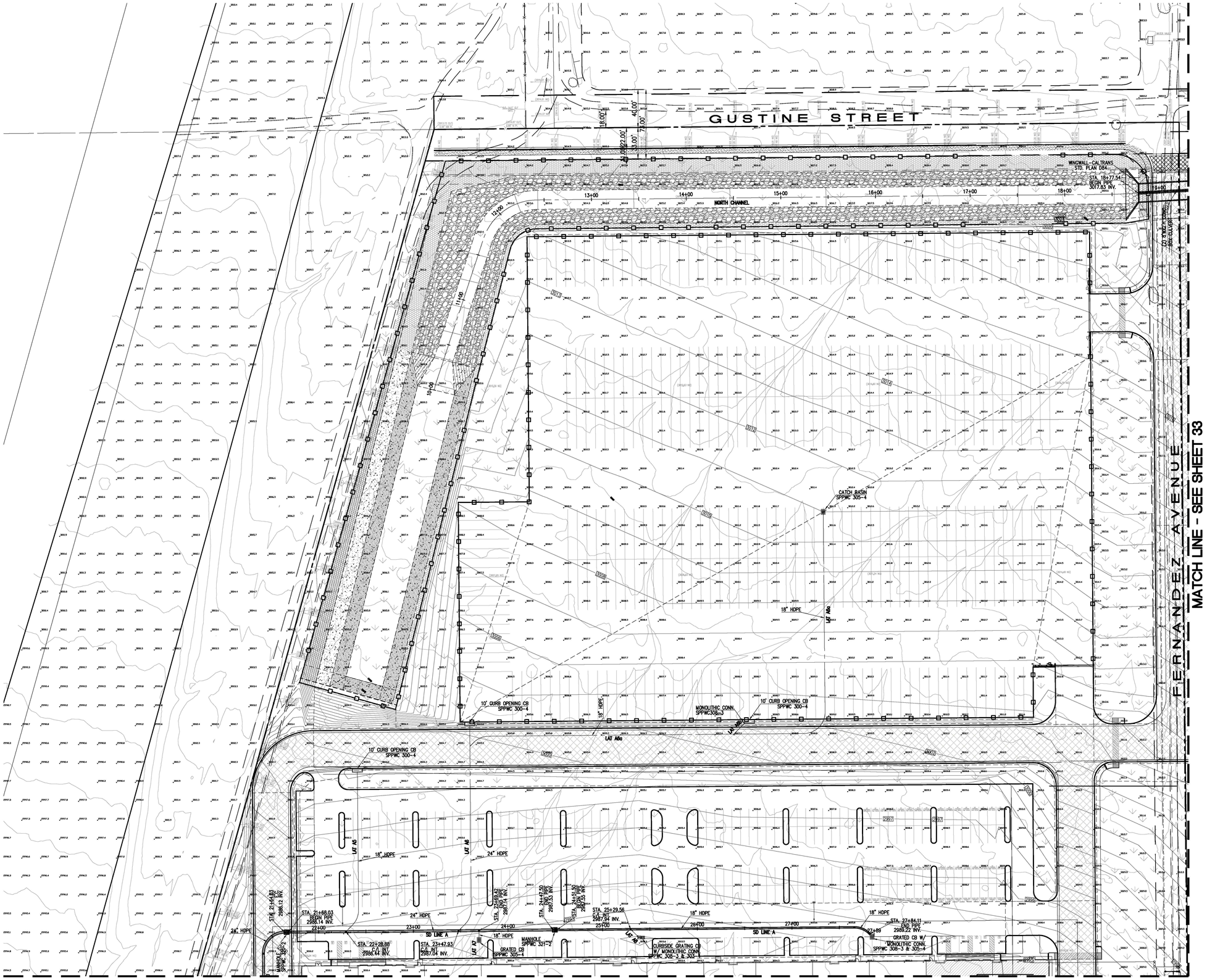
C&S COMPANIES®

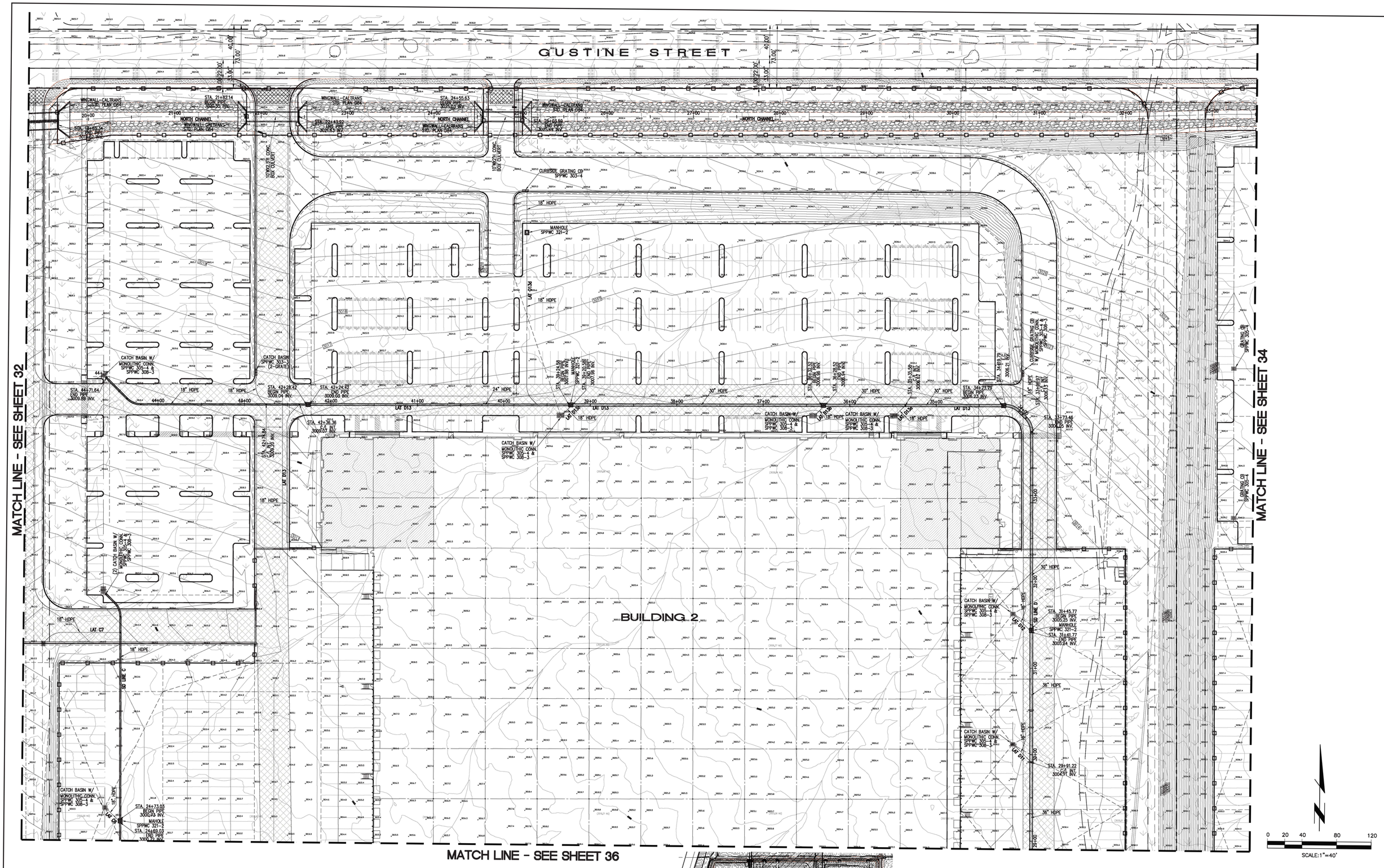


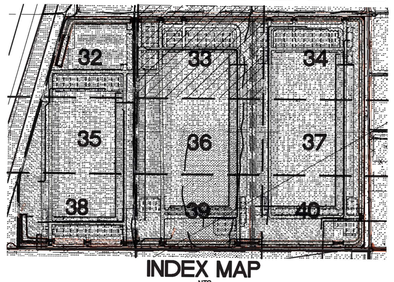
APPLE VALLEY AIRPORT
STORM WATER MASTER PLAN
HYDROLOGY WORK MAP FOR
RATIONAL METHOD AND UNIT HYDROGRAPH METHOD

C&S COMPANIES

Chang Consultants
Civil Engineering-Hydrology-Hydraulics-Sedimentation
P.O. Box 9496
Rancho Santa Fe, CA 92067
T: 858.692.0760
F: 858.832.1402


GUSTINE STREET
FERNANDEZ AVENUE
MATCH LINE - SEE SHEET 33
MATCH LINE - SEE SHEET 35
NORTH CHANNEL
WINGWALL-CALTRANS STD. PLAN D84
STA. 18+77.54
BEGIN PIPE
3017.83 INV.
(2) 8'W x 7'H CONC. BOX CULVERT
CATCH BASIN
SPPWC 305-4
18" HDPE
LAT A6a
10' CURB OPENING CB
SPPWC 300-4
MONOLITHIC CONN.
SPPWC308-3
LAT A5
24" HDPE
SD LINE A
STA. 21+68.03
BEGIN PIPE
2986.12 INV.
STA. 22+28.88
END PIPE
2986.44 INV.
STA. 23+47.93
BEGIN PIPE
2987.04 INV.
STA. 24+69.42
END PIPE
2987.14 INV.
STA. 24+87.50
BEGIN PIPE
2987.53 INV.
STA. 24+91.50
END PIPE
2987.55 INV.
STA. 25+29.56
END PIPE
2987.94 INV.
STA. 27+84.11
END PIPE
2989.22 INV.
GRATED CB W/
MONOLITHIC CONN.
SPPWC 308-3 & 305-4
CURBSIDE GRATING CB
W/ MONOLITHIC CONN.
SPPWC 308-3 & 305-4
GRATED CB
SPPWC 305-4
MANHOLE
SPPWC 321-2
LAT A7
LAT A8
LAT A9
LAT A10
LAT A11
LAT A12
LAT A13
LAT A14
LAT A15
LAT A16
LAT A17
LAT A18
LAT A19
LAT A20
LAT A21
LAT A22
LAT A23
LAT A24
LAT A25
LAT A26
LAT





INDEX MAP
NTS

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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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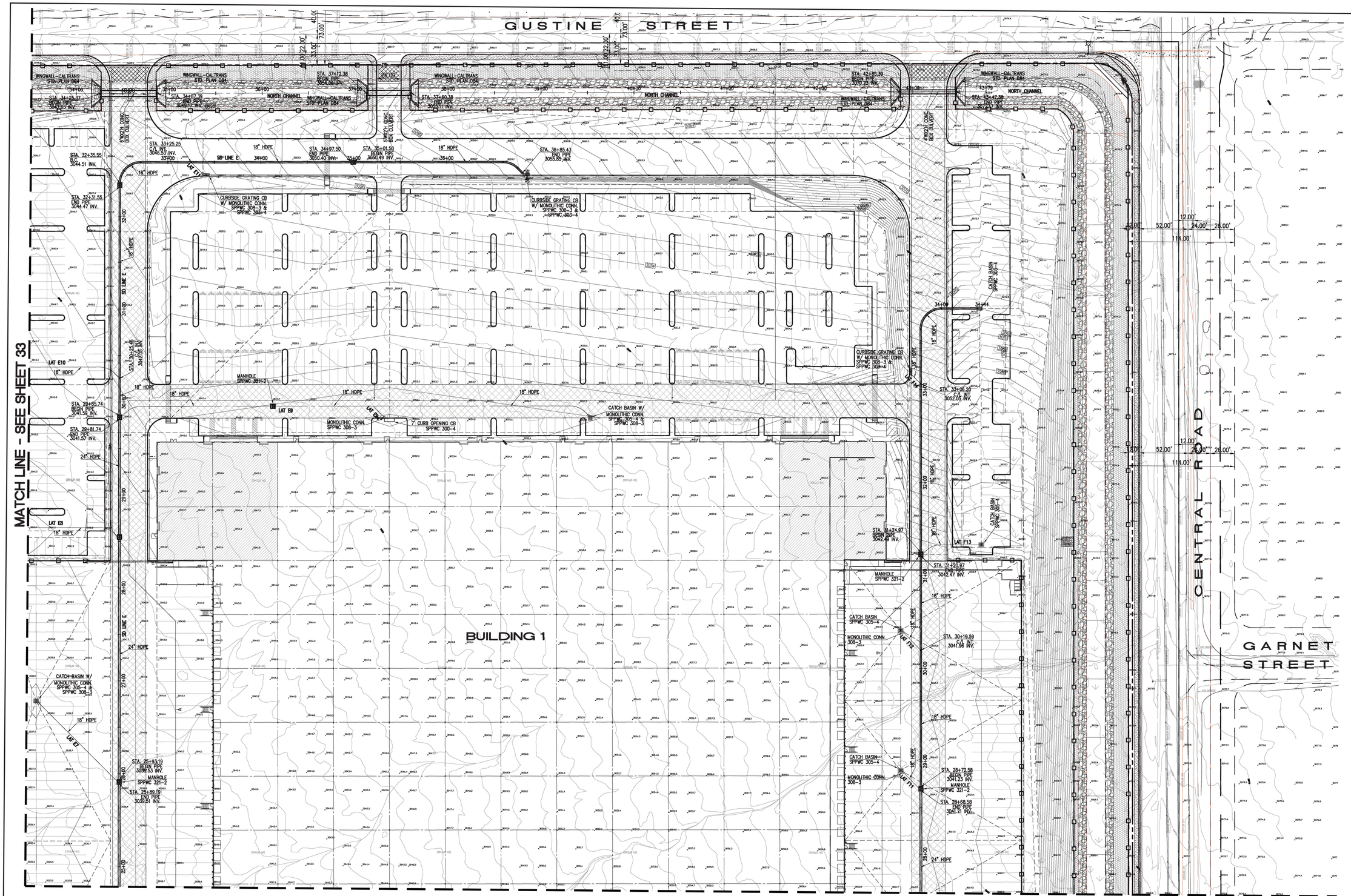
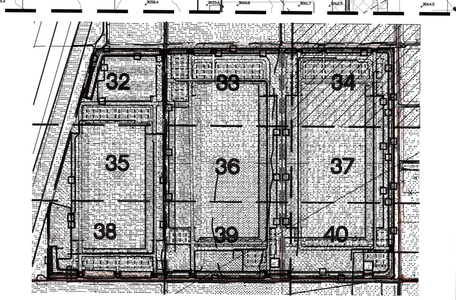
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 33 of 47 Sheets

4099/33 OF 47 SHEETS





INDEX MAP
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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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Checked by _____ Date _____

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Public Works Director _____ R.C.E. XXXXX

Sheet 34 of 47 Sheets

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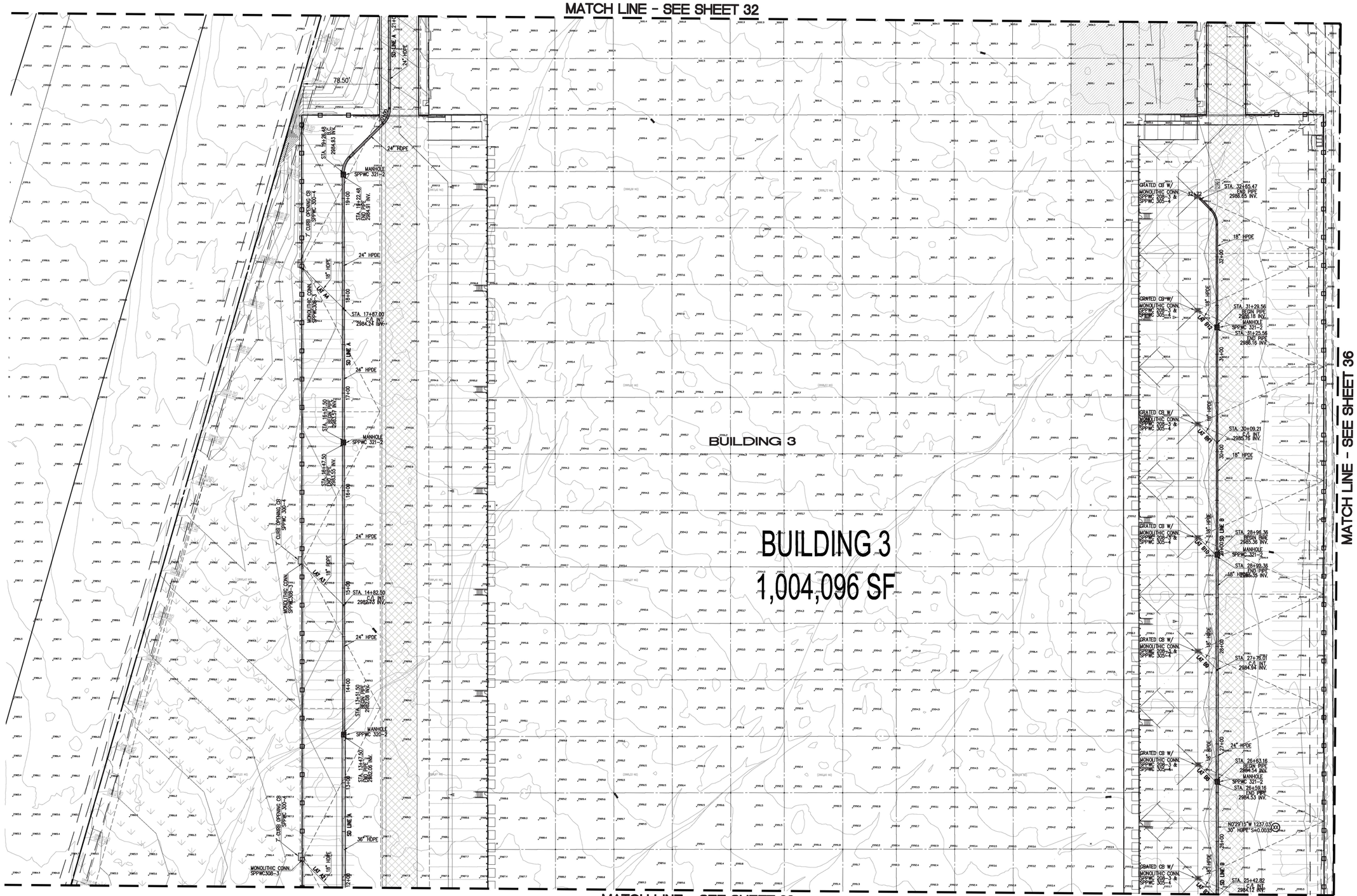
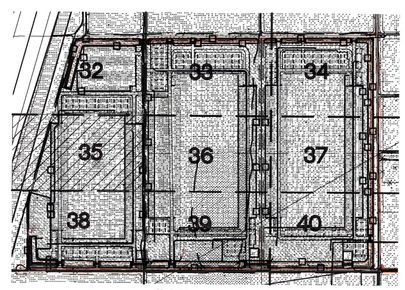
MATCH LINE - SEE SHEET 32



MATCH LINE - SEE SHEET 38

0 20 40 80 120

SCALE:1"=40'



INDEX MAP
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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

GRADING PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX:(714)521-4173

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Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 35 of 47 Sheets

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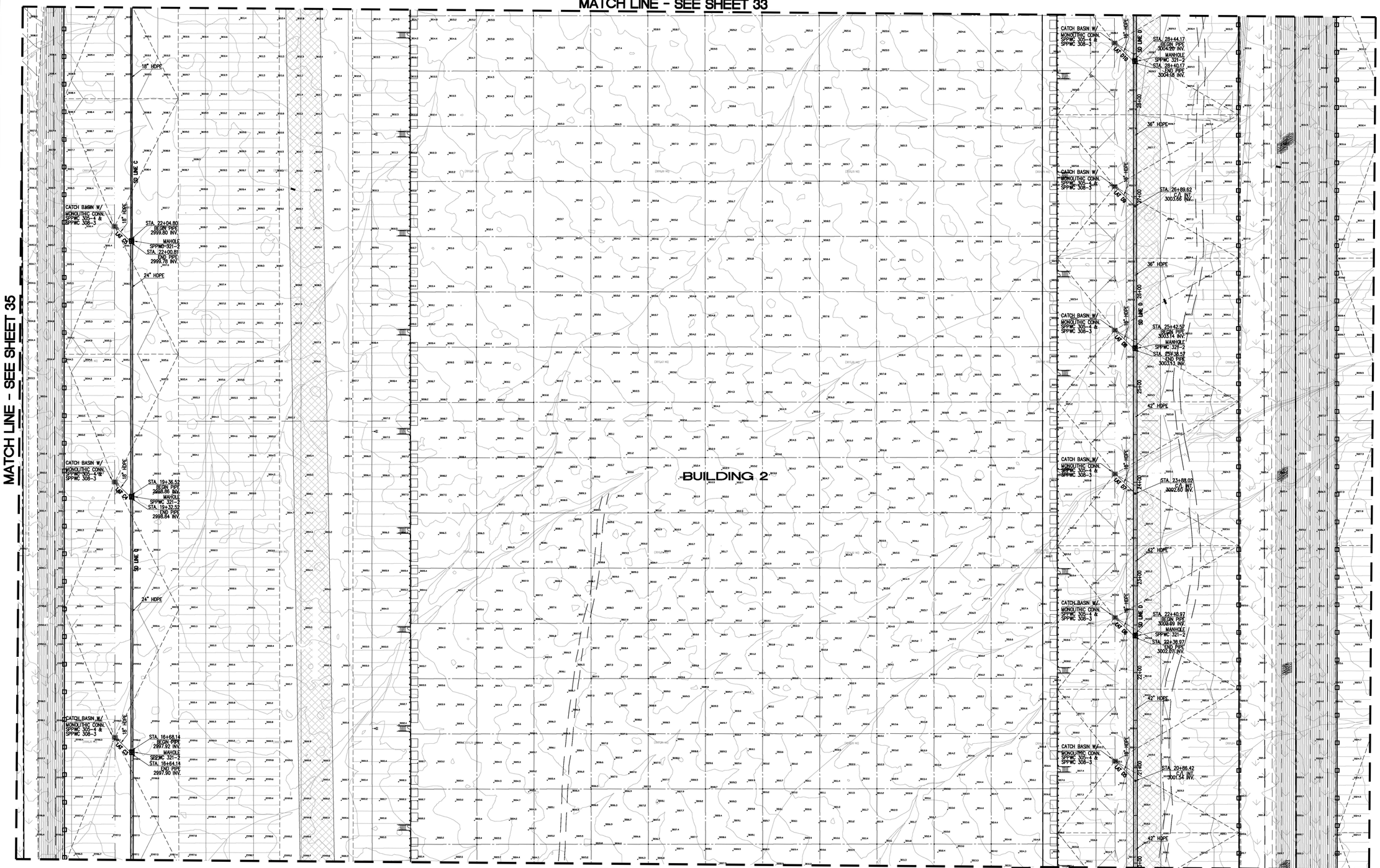
MATCH LINE - SEE SHEET 33

MATCH LINE - SEE SHEET 35



MATCH LINE - SEE SHEET 37

MATCH LINE - SEE SHEET 39

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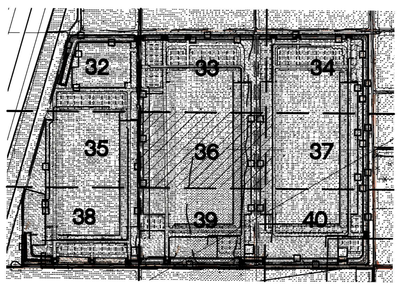

INDEX MAP
NTS

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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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Checked by _____ Date _____

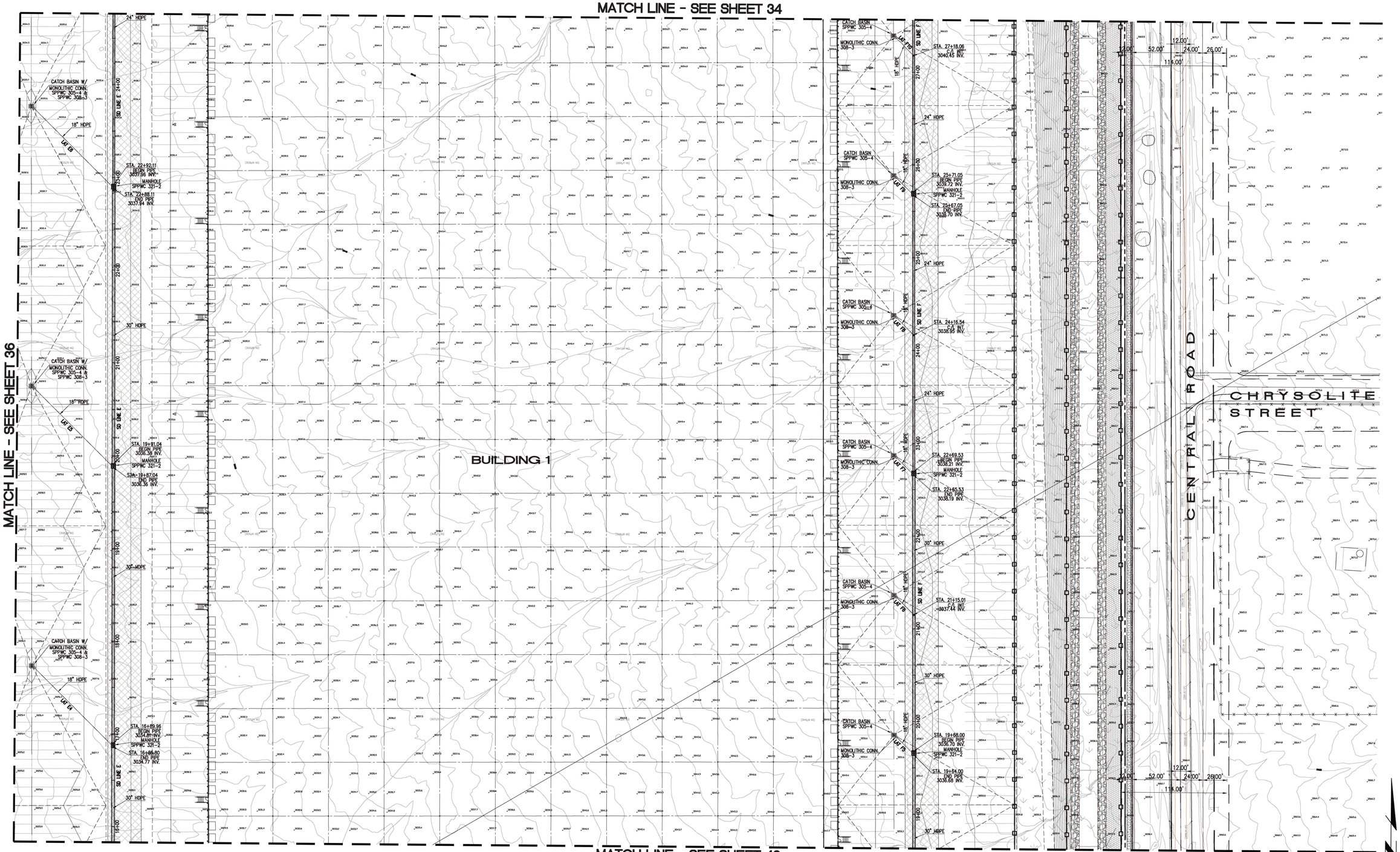
Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 36 of 47 Sheets

4099/36 OF 47 SHEETS

MATCH LINE - SEE SHEET 34

MATCH LINE - SEE SHEET 36



MATCH LINE - SEE SHEET 40

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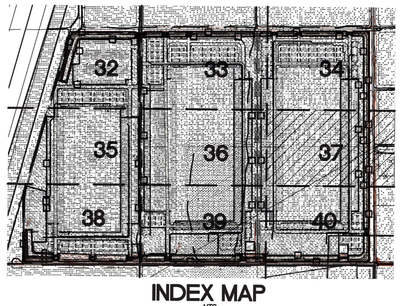

INDEX MAP

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COUNTY OF SAN BERNARDINO

PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN

APPLE VALLEY ASSEMBLAGE

SW CORNER OF QUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:

LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

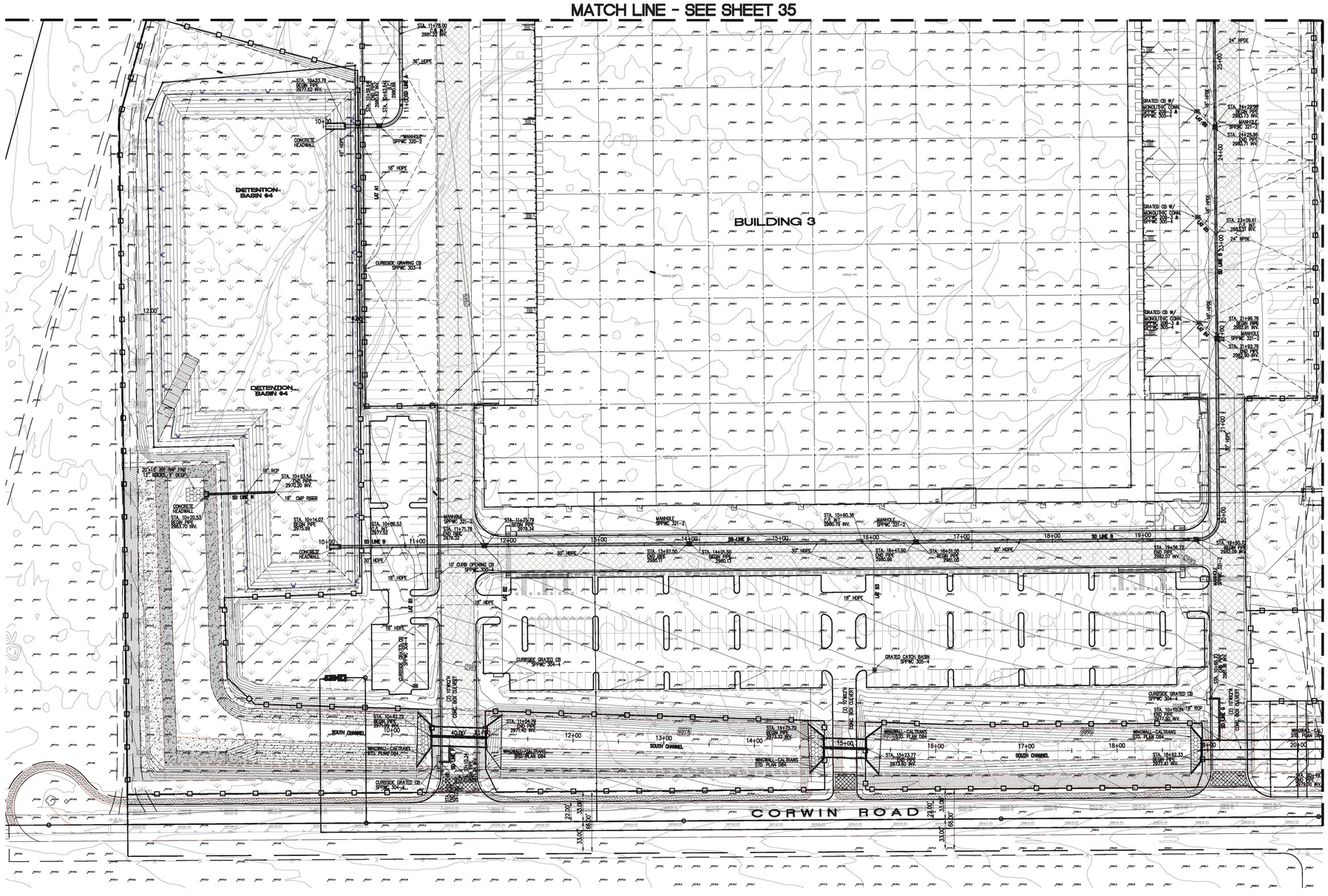
Approved by _____ Date _____

Public Works Director _____ R.C.E. XXXXX

Sheet 37 of 47 Sheets

4099/37 OF 47 SHEETS

MATCH LINE - SEE SHEET 35



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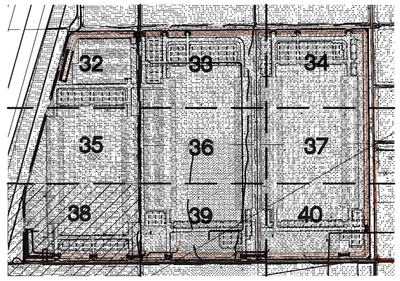
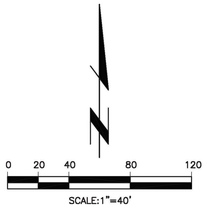


INDEX MAP
NTS



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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

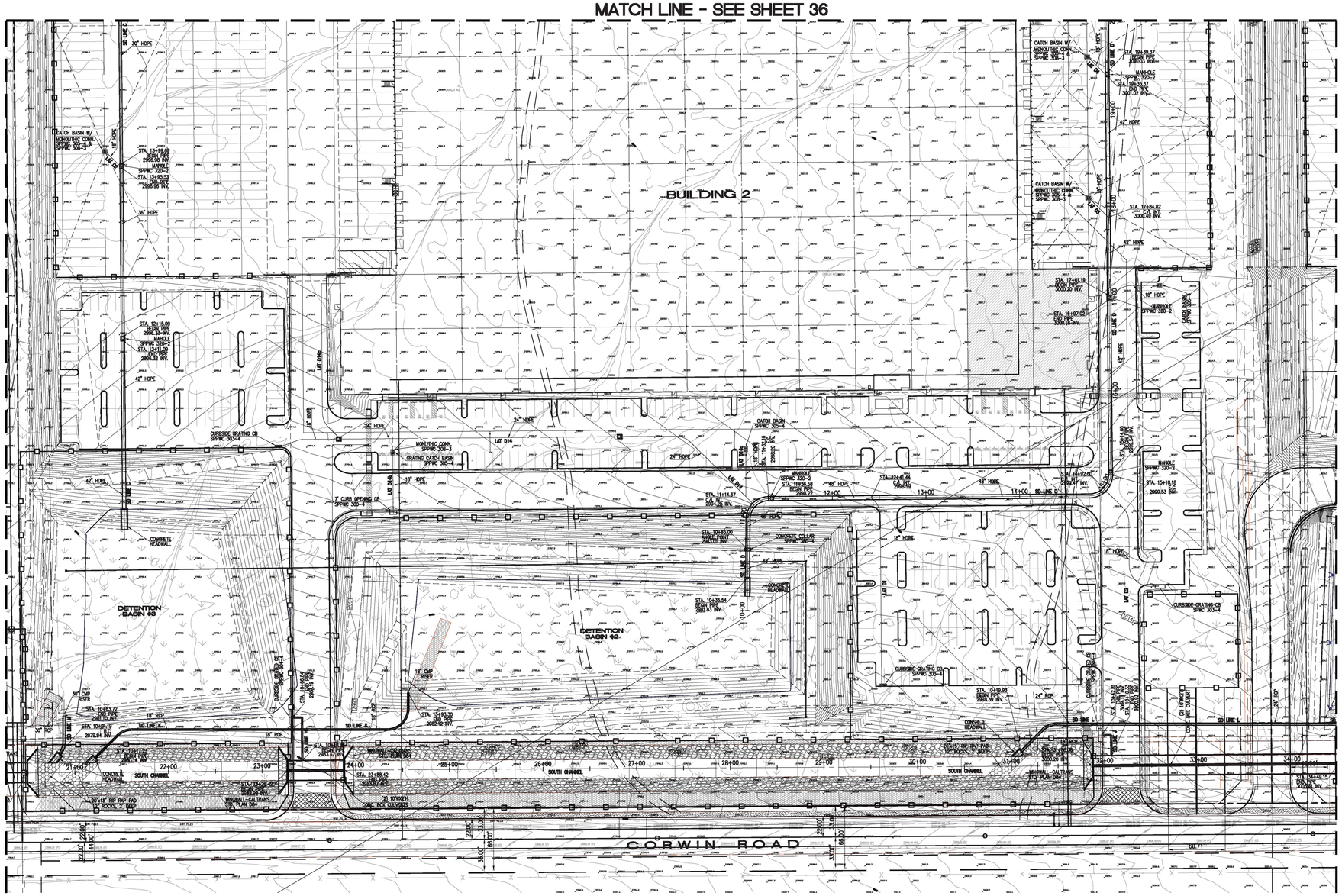
Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 38 of 47 Sheets

4099/38 OF 47 SHEETS

MATCH LINE - SEE SHEET 36

MATCH LINE - SEE SHEET 38



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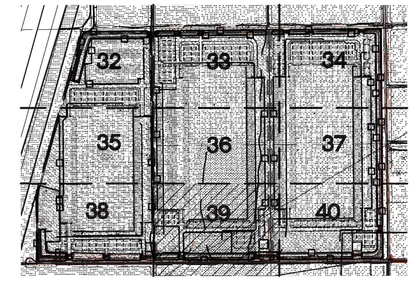

INDEX MAP
NTS

0 20 40 80 120
SCALE:1"=40'

Last Update:9/5/24
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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN

APPLE VALLEY ASSEMBLAGE

SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:

LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

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Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____

Public Works Director _____ R.C.E. XXXXX

Sheet 39 of 47 Sheets

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MATCH LINE - SEE SHEET 37

MATCH LINE - SEE SHEET 39

BUILDING 1

DETENTION BASIN #1

DETENTION BASIN #1

CORWIN ROAD

CENTRAL ROAD

SOUTH CHANNEL

SCALE:1"=40'

0 20 40 80 120

Last Update:9/5/24
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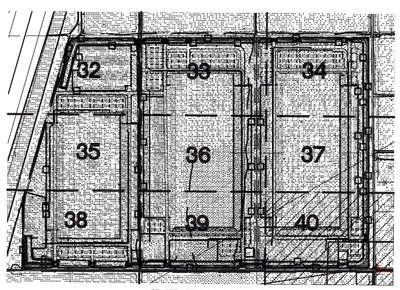

INDEX MAP
NTS

PREPARED FOR:

LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX:(714)521-4173

COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF QUSTIN ROAD
AND CENTRAL ROAD

Designed by
Date
Checked by
Date
Designed by
Date
Checked by
Date

Approved by Date

Public Works Director R.C.E. XXXXX

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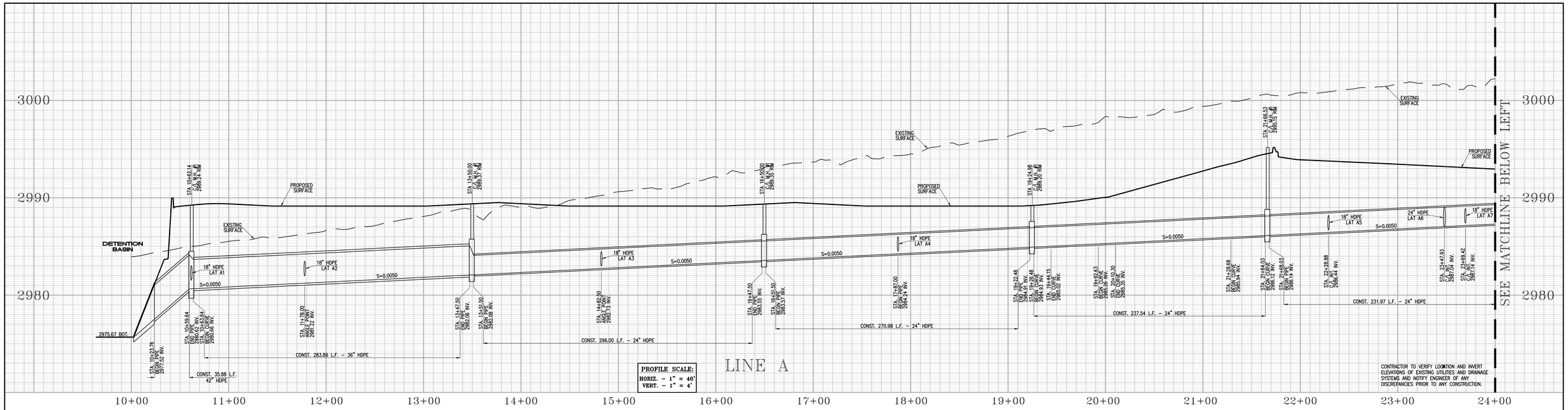
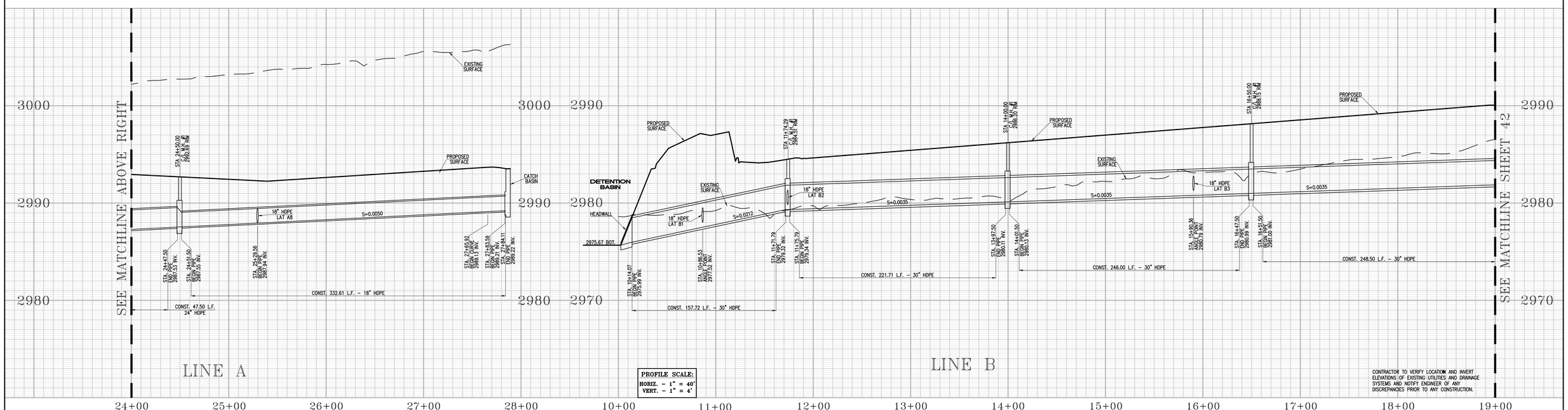


CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.



CONTRACTOR TO VERIFY LOCATION AND INVERT ELEVATIONS OF EXISTING UTILITIES AND DRAINAGE SYSTEMS AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY CONSTRUCTION.

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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
13681 NEWPORT AVENUE, SUITE 8301
TUSTIN, CA 92780
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX(714)521-4173

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Checked by _____ Date _____

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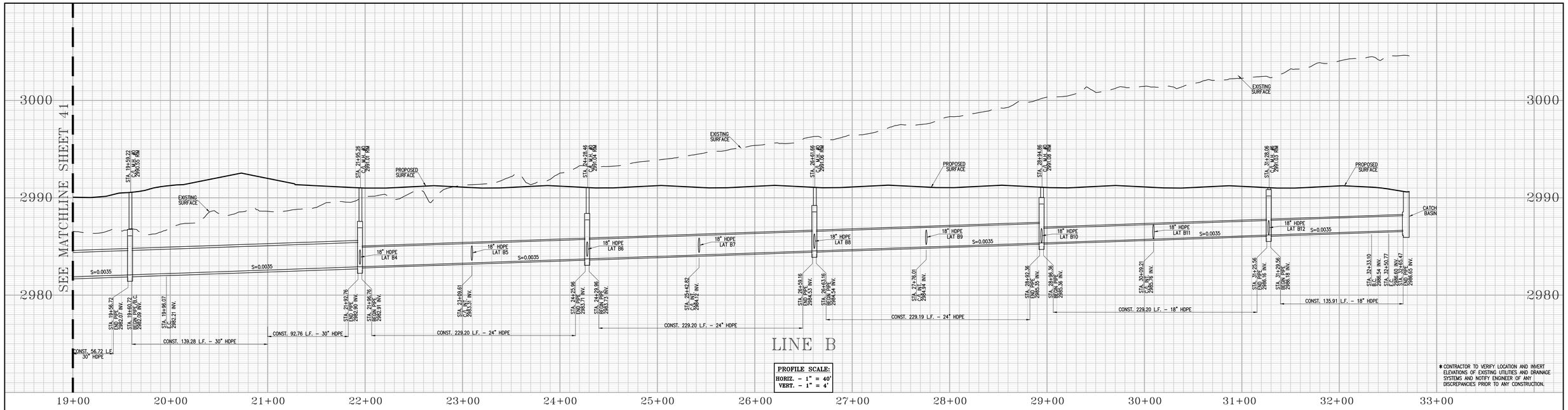
Public Works Director _____ R.C.E. XXXXX

Sheet 41 of 47 Sheets

4099/41 OF 47 SHEETS



LINE B

PROFILE SCALE:
HORIZ. – 1" = 40'
VERT. – 1" = 4'

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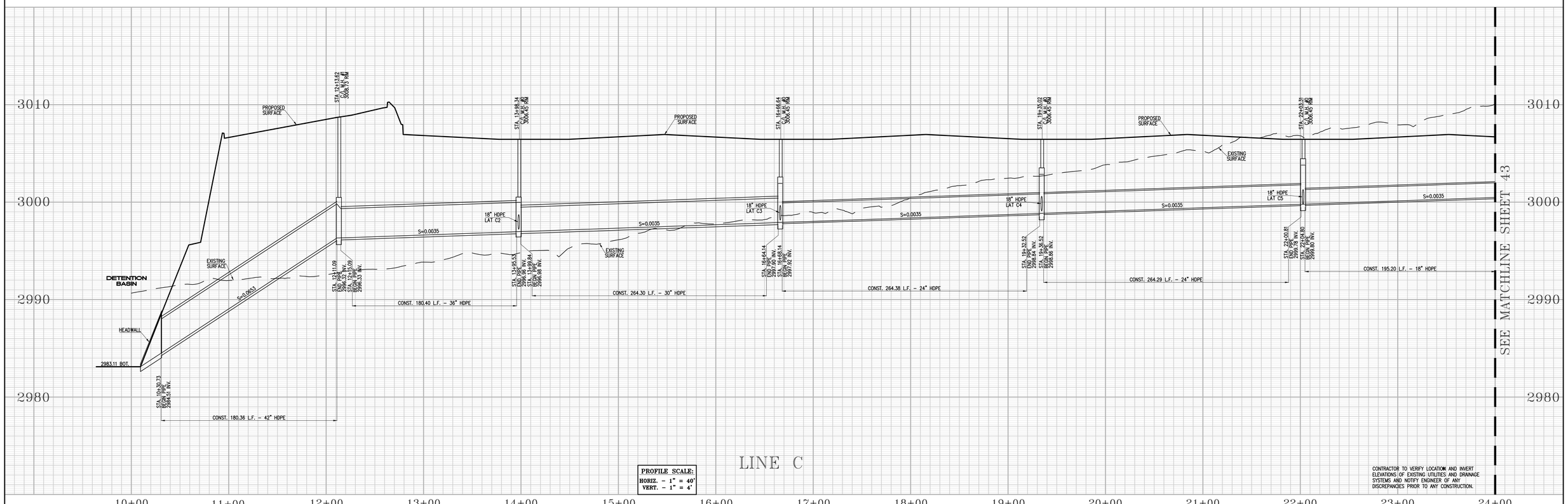

LINE C

PROFILE SCALE:
HORIZ. – 1" = 40'
VERT. – 1" = 4'

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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN

APPLE VALLEY ASSEMBLAGE

SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

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Sheet 42 of 47 Sheets

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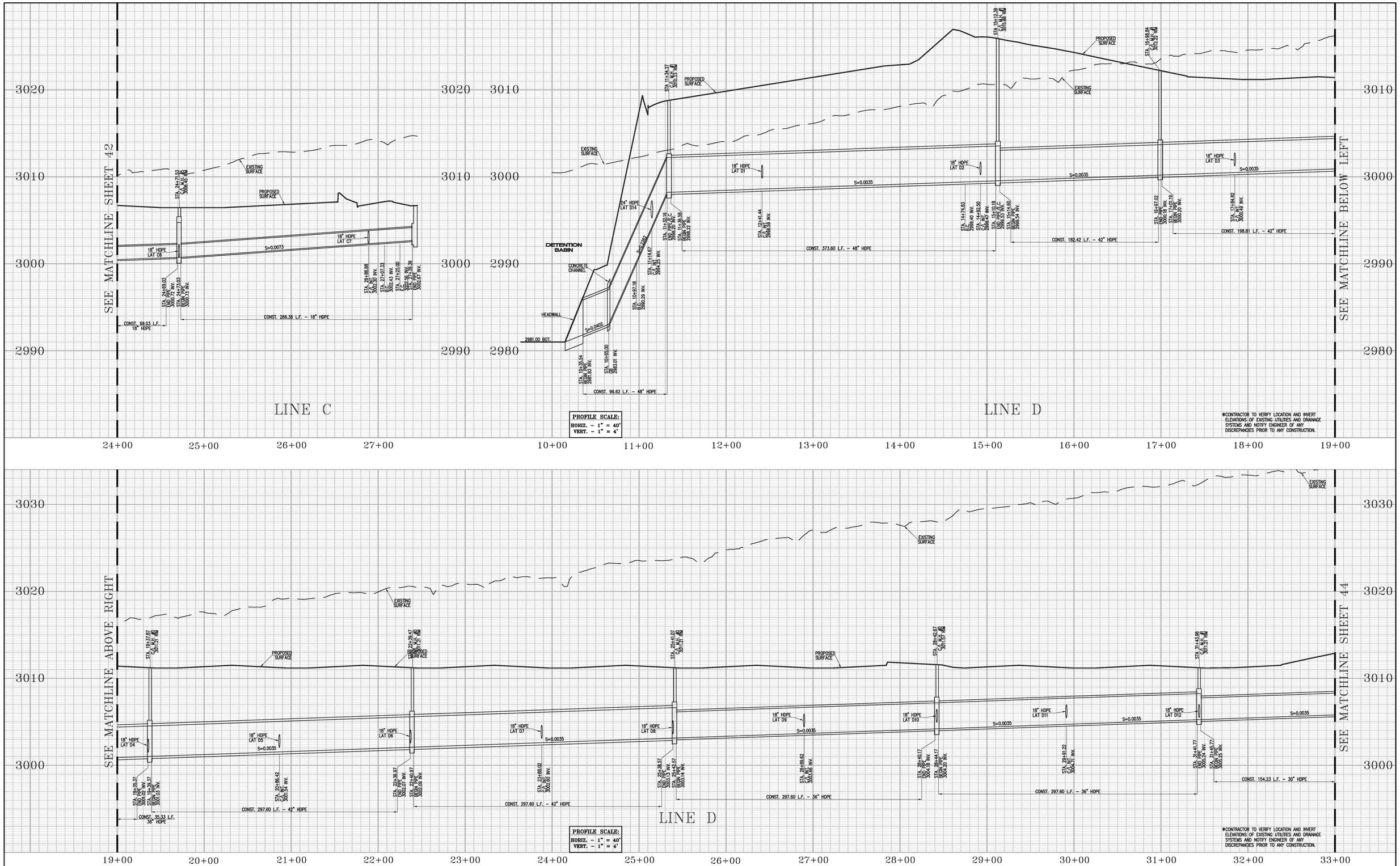

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COUNTY OF SAN BERNARDINO

PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN

APPLE VALLEY ASSEMBLAGE

SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:

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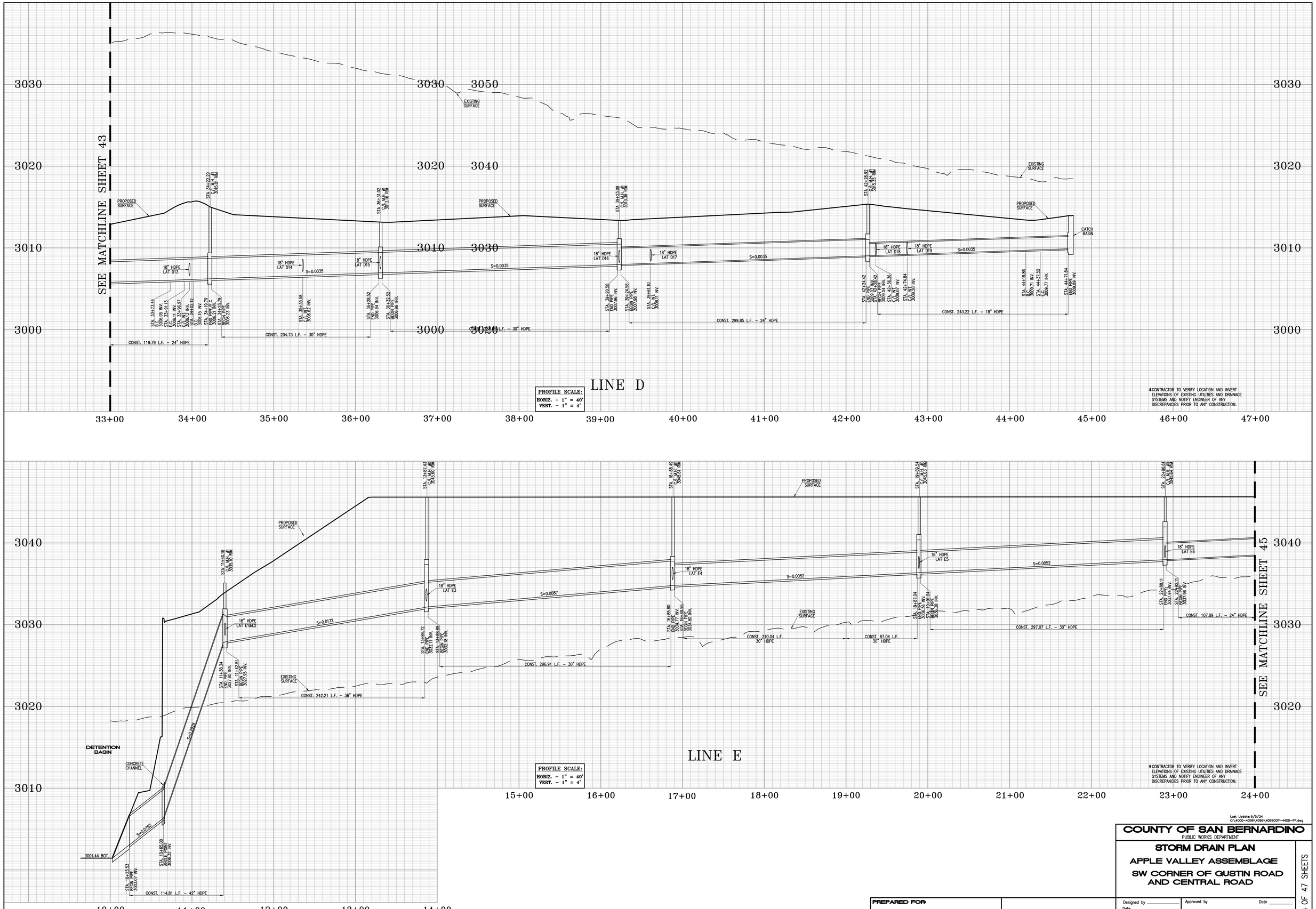
Sheet 43 of 47 Sheets

4099/A3 OF 47 SHEETS



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COUNTY OF SAN BERNARDINO
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STORM DRAIN PLAN

APPLE VALLEY ASSEMBLAGE

SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:

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Sheet **44** of **47** Sheets

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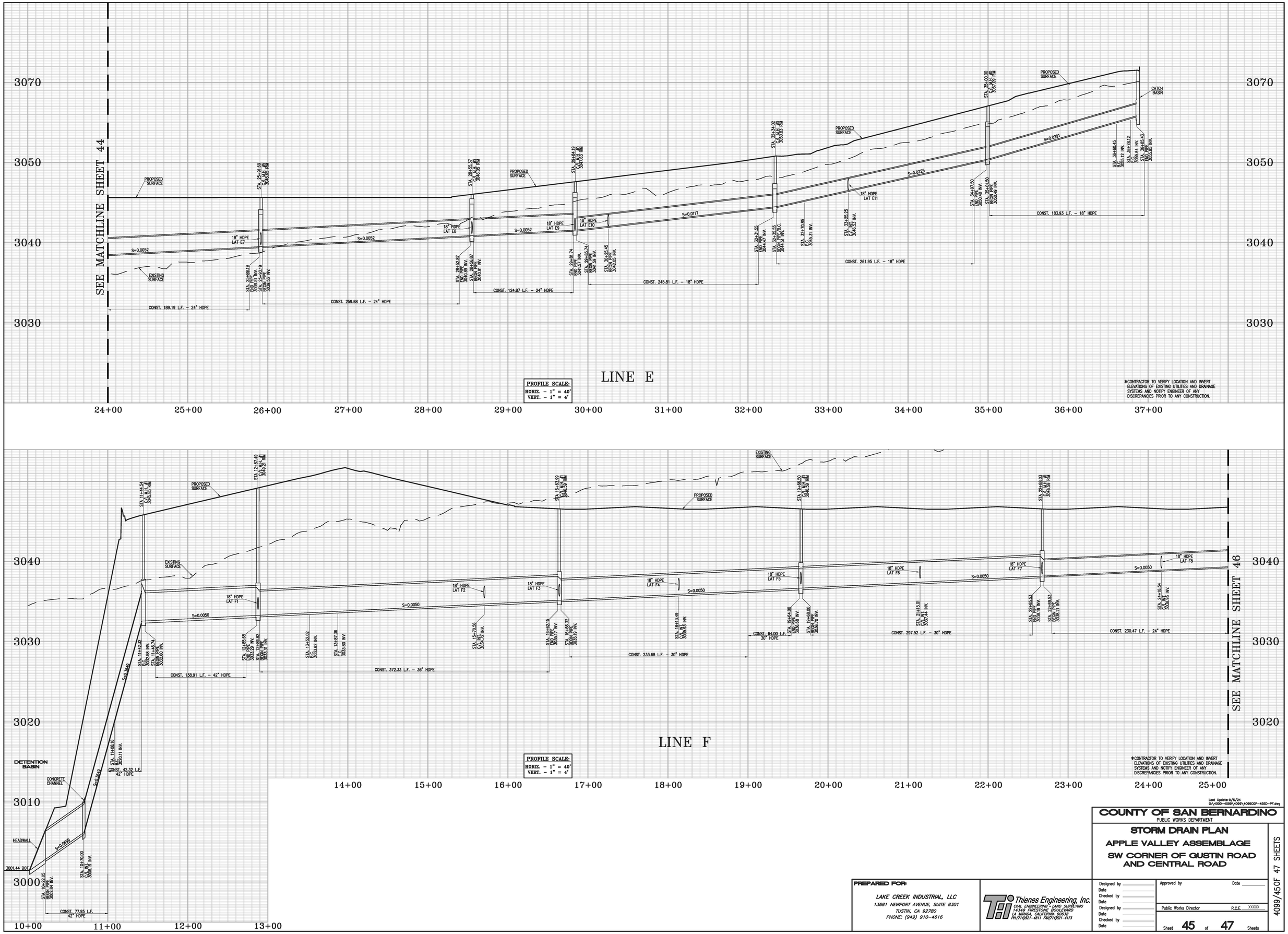

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Sheet 45 of 47 Sheets

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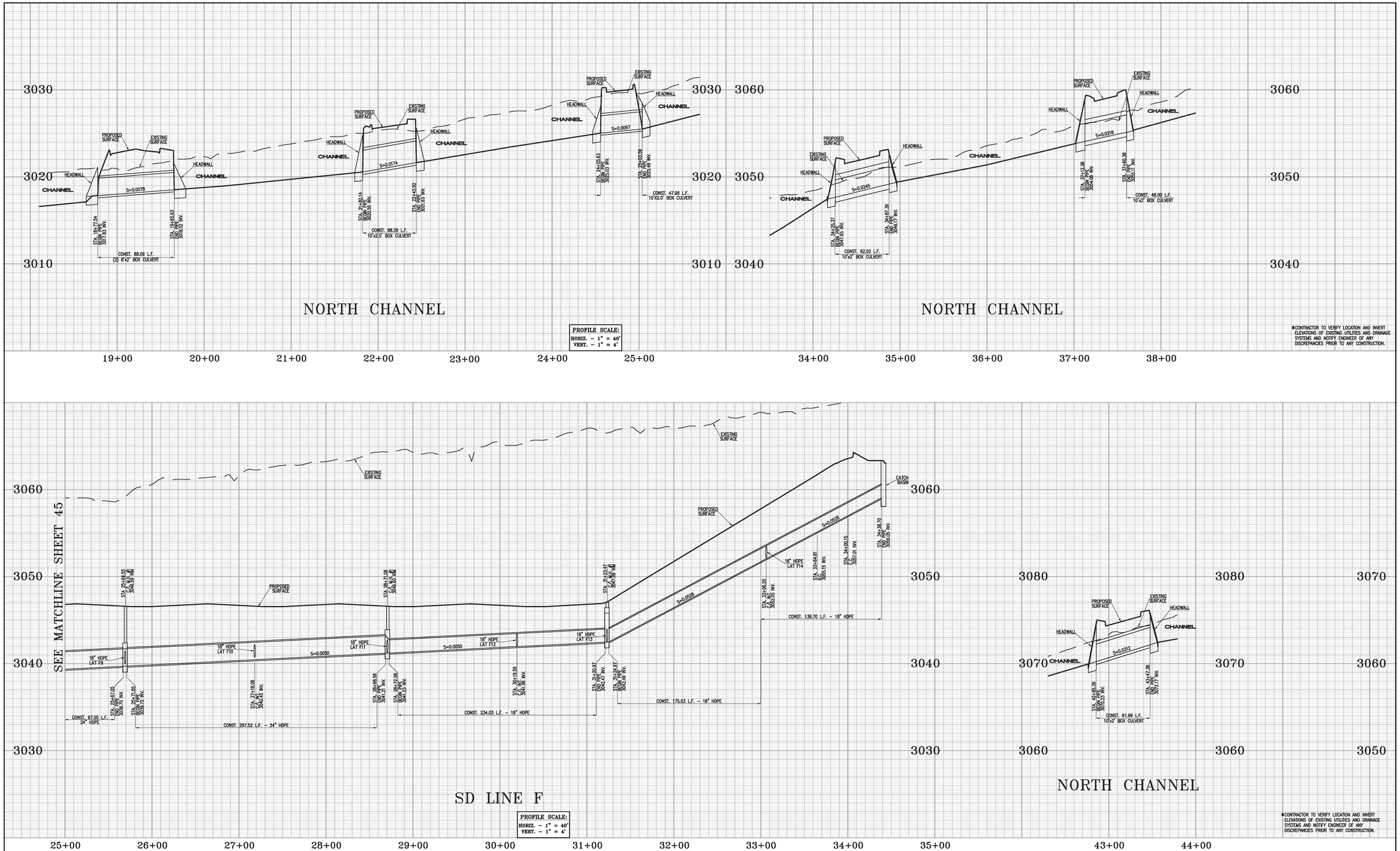

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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

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Sheet 46 of 47 Sheets

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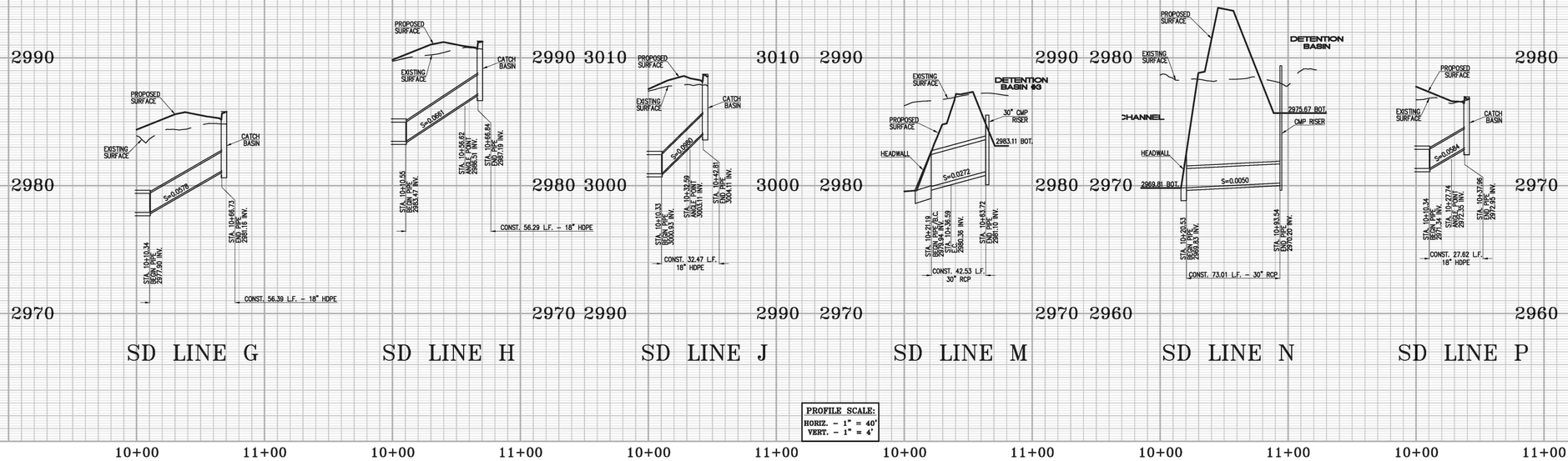

PROFILE SCALE:
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VERT. - 1" = 4'

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COUNTY OF SAN BERNARDINO
PUBLIC WORKS DEPARTMENT

STORM DRAIN PLAN
APPLE VALLEY ASSEMBLAGE
SW CORNER OF GUSTIN ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL, LLC
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Public Works Director R.C.E. XXXXX
Sheet 48 of 48 Sheets

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APPENDIX B

HYDROLOGY CALCULATIONS

EXISTING CONDITION

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****************************************************************************
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          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-99 Advanced Engineering Software (aes)
             Ver. 8.0  Release Date: 01/01/99  License ID 1435

                          Analysis prepared by:

                           THIENES ENGINEERING
                         16800 VALLEY VIEW AVENUE
                            LA MIRADA CA 90638
                   PH: (714) 521-4811 FAX: (714) 521-4173

 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 100-104)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E100.DAT
  TIME/DATE OF STUDY: 12:26 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =   3027.77  DOWNSTREAM(FEET) =   3009.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   18.589
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.121
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        4.67      0.29      1.00    85   18.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      7.70
  TOTAL AREA(ACRES) =      4.67   PEAK FLOW RATE(CFS) =      7.70

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3009.80  DOWNSTREAM(FEET) =   2999.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =   618.00   CHANNEL SLOPE =  0.0172
  CHANNEL FLOW THRU SUBAREA(CFS) =      7.70
  FLOW VELOCITY(FEET/SEC) =   3.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.36   Tc(MIN.) =  21.95
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =  1618.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  21.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.920
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        6.82      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    6.82      SUBAREA RUNOFF(CFS) =   10.00
  EFFECTIVE AREA(ACRES) =    11.49   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    11.49       PEAK FLOW RATE(CFS) =      16.85

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2999.18  DOWNSTREAM(FEET) =   2990.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   638.00   CHANNEL SLOPE =  0.0141
  CHANNEL FLOW THRU SUBAREA(CFS) =     16.85
  FLOW VELOCITY(FEET/SEC) =   3.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.13   Tc(MIN.) =  25.08
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =  2256.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  25.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       10.22      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   10.22      SUBAREA RUNOFF(CFS) =   13.63
  EFFECTIVE AREA(ACRES) =    21.71   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    21.71       PEAK FLOW RATE(CFS) =      28.96

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2990.20  DOWNSTREAM(FEET) =   2974.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1222.00   CHANNEL SLOPE =  0.0130
  CHANNEL FLOW THRU SUBAREA(CFS) =     28.96
  FLOW VELOCITY(FEET/SEC) =   3.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.39   Tc(MIN.) =  30.47
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =  3478.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  30.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.577
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       10.54      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   10.54      SUBAREA RUNOFF(CFS) =   12.21
  EFFECTIVE AREA(ACRES) =    32.25   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    32.25       PEAK FLOW RATE(CFS) =      37.35
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     32.25  TC(MIN.) =     30.47
  EFFECTIVE AREA(ACRES) =     32.25  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     37.35
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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                          Analysis prepared by:

                           THIENES ENGINEERING
                         16800 VALLEY VIEW AVENUE
                            LA MIRADA CA 90638
                   PH: (714) 521-4811 FAX: (714) 521-4173

 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 200-204)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E200.DAT
  TIME/DATE OF STUDY: 12:27 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =   3045.90  DOWNSTREAM(FEET) =   3021.14

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.434
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.204
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        5.02      0.29      1.00    85   17.43
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      8.65
  TOTAL AREA(ACRES) =      5.02   PEAK FLOW RATE(CFS) =      8.65

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3021.14  DOWNSTREAM(FEET) =   3003.58
  CHANNEL LENGTH THRU SUBAREA(FEET) =   946.00   CHANNEL SLOPE =  0.0186
  CHANNEL FLOW THRU SUBAREA(CFS) =      8.65
  FLOW VELOCITY(FEET/SEC) =   3.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.80   Tc(MIN.) =  22.24
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =  1946.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  22.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.905
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        7.07      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    7.07      SUBAREA RUNOFF(CFS) =   10.27
  EFFECTIVE AREA(ACRES) =    12.09   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    12.09       PEAK FLOW RATE(CFS) =      17.57

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3003.58  DOWNSTREAM(FEET) =   2991.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   706.00   CHANNEL SLOPE =  0.0170
  CHANNEL FLOW THRU SUBAREA(CFS) =     17.57
  FLOW VELOCITY(FEET/SEC) =   3.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =  25.36
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =  2652.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  25.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.760
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       10.32      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   10.32      SUBAREA RUNOFF(CFS) =   13.66
  EFFECTIVE AREA(ACRES) =    22.41   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    22.41       PEAK FLOW RATE(CFS) =      29.66

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2991.60  DOWNSTREAM(FEET) =   2974.34
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1326.00   CHANNEL SLOPE =  0.0130
  CHANNEL FLOW THRU SUBAREA(CFS) =     29.66
  FLOW VELOCITY(FEET/SEC) =   3.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.80   Tc(MIN.) =  31.16
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =  3978.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  31.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.556
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       12.40      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   12.40      SUBAREA RUNOFF(CFS) =   14.12
  EFFECTIVE AREA(ACRES) =    34.81   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    34.81       PEAK FLOW RATE(CFS) =      39.65
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     34.81  TC(MIN.) =     31.16
  EFFECTIVE AREA(ACRES) =     34.81  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     39.65
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 300-306)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E300.DAT
  TIME/DATE OF STUDY: 12:29 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =   3079.60  DOWNSTREAM(FEET) =   3048.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.657
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.265
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        4.31      0.29      1.00    85   16.66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      7.66
  TOTAL AREA(ACRES) =      4.31   PEAK FLOW RATE(CFS) =      7.66

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3048.50  DOWNSTREAM(FEET) =   3033.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.0286
  CHANNEL FLOW THRU SUBAREA(CFS) =      7.66
  FLOW VELOCITY(FEET/SEC) =   3.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =  18.87
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =  1525.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  18.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.102
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        6.23      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    6.23      SUBAREA RUNOFF(CFS) =   10.16
  EFFECTIVE AREA(ACRES) =    10.54   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    10.54       PEAK FLOW RATE(CFS) =      17.19

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3033.50  DOWNSTREAM(FEET) =   3019.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.0259
  CHANNEL FLOW THRU SUBAREA(CFS) =     17.19
  FLOW VELOCITY(FEET/SEC) =   4.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =  20.81
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =  2065.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  20.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        9.21      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    9.21      SUBAREA RUNOFF(CFS) =   14.02
  EFFECTIVE AREA(ACRES) =    19.75   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    19.75       PEAK FLOW RATE(CFS) =      30.07

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3019.50  DOWNSTREAM(FEET) =   3003.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.0305
  CHANNEL FLOW THRU SUBAREA(CFS) =     30.07
  FLOW VELOCITY(FEET/SEC) =   5.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =  22.31
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =  2590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  22.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       13.74      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   13.74      SUBAREA RUNOFF(CFS) =   19.92
  EFFECTIVE AREA(ACRES) =    33.49   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    33.49       PEAK FLOW RATE(CFS) =      48.56

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3003.50  DOWNSTREAM(FEET) =   2984.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1126.00   CHANNEL SLOPE =  0.0173
  CHANNEL FLOW THRU SUBAREA(CFS) =     48.56
  FLOW VELOCITY(FEET/SEC) =   5.05 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.72   Tc(MIN.) =  26.03
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    305.00 =  3716.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  26.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       16.84      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   16.84      SUBAREA RUNOFF(CFS) =   21.87
  EFFECTIVE AREA(ACRES) =    50.33   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    50.33       PEAK FLOW RATE(CFS) =      65.37

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    306.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2984.00  DOWNSTREAM(FEET) =   2979.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   374.00   CHANNEL SLOPE =  0.0126
  CHANNEL FLOW THRU SUBAREA(CFS) =     65.37
  FLOW VELOCITY(FEET/SEC) =   4.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.33   Tc(MIN.) =  27.35
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    306.00 =  4090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  27.35
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.682
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       13.56      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   13.56      SUBAREA RUNOFF(CFS) =   16.99
  EFFECTIVE AREA(ACRES) =    63.89   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    63.89       PEAK FLOW RATE(CFS) =      80.05
```

```
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     63.89  TC(MIN.) =     27.35
  EFFECTIVE AREA(ACRES) =     63.89  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     80.05
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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****************************************************************************
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                          Analysis prepared by:

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                            LA MIRADA CA 90638
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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 400-405)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E400.DAT
  TIME/DATE OF STUDY: 13:24 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =   3079.78  DOWNSTREAM(FEET) =   3050.71

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.884
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.247
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        4.87      0.29      1.00    85   16.88
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      8.58
  TOTAL AREA(ACRES) =      4.87   PEAK FLOW RATE(CFS) =      8.58

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3050.71  DOWNSTREAM(FEET) =   3029.01
  CHANNEL LENGTH THRU SUBAREA(FEET) =   766.00   CHANNEL SLOPE =  0.0283
  CHANNEL FLOW THRU SUBAREA(CFS) =      8.58
  FLOW VELOCITY(FEET/SEC) =   4.05 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.15   Tc(MIN.) =  20.04
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    402.00 =  1766.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  20.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.028
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        6.98      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    6.98      SUBAREA RUNOFF(CFS) =   10.92
  EFFECTIVE AREA(ACRES) =    11.85   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    11.85       PEAK FLOW RATE(CFS) =      18.53

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3029.01  DOWNSTREAM(FEET) =   3016.92
  CHANNEL LENGTH THRU SUBAREA(FEET) =   531.00   CHANNEL SLOPE =  0.0228
  CHANNEL FLOW THRU SUBAREA(CFS) =     18.53
  FLOW VELOCITY(FEET/SEC) =   4.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.00   Tc(MIN.) =  22.04
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    403.00 =  2297.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  22.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.915
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       10.44      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   10.44      SUBAREA RUNOFF(CFS) =   15.27
  EFFECTIVE AREA(ACRES) =    22.29   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    22.29       PEAK FLOW RATE(CFS) =      32.60

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3016.92  DOWNSTREAM(FEET) =   2997.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =   875.00   CHANNEL SLOPE =  0.0218
  CHANNEL FLOW THRU SUBAREA(CFS) =     32.60
  FLOW VELOCITY(FEET/SEC) =   5.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =  24.92
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    404.00 =  3172.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  24.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.779
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       15.40      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   15.40      SUBAREA RUNOFF(CFS) =   20.64
  EFFECTIVE AREA(ACRES) =    37.69   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    37.69       PEAK FLOW RATE(CFS) =      50.50

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    405.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2997.88  DOWNSTREAM(FEET) =   2982.64
  CHANNEL LENGTH THRU SUBAREA(FEET) =   906.00   CHANNEL SLOPE =  0.0168
  CHANNEL FLOW THRU SUBAREA(CFS) =     50.50
  FLOW VELOCITY(FEET/SEC) =   5.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.00   Tc(MIN.) =  27.92
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    405.00 =  4078.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    405.00 TO NODE    405.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  27.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.662
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C       18.64      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =   18.64      SUBAREA RUNOFF(CFS) =   23.01
  EFFECTIVE AREA(ACRES) =    56.33   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    56.33       PEAK FLOW RATE(CFS) =      69.54
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     56.33  TC(MIN.) =     27.92
  EFFECTIVE AREA(ACRES) =     56.33  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     69.54
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 500-503)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E500.DAT
  TIME/DATE OF STUDY: 13:26 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   761.00
  ELEVATION DATA: UPSTREAM(FEET) =   3065.93  DOWNSTREAM(FEET) =   3042.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.901
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.422
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        3.32      0.29      1.00    85   14.90
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      6.37
  TOTAL AREA(ACRES) =      3.32   PEAK FLOW RATE(CFS) =      6.37

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3042.00  DOWNSTREAM(FEET) =   3009.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1164.00   CHANNEL SLOPE =  0.0277
  CHANNEL FLOW THRU SUBAREA(CFS) =      6.37
  FLOW VELOCITY(FEET/SEC) =   3.72 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.22   Tc(MIN.) =  20.12
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =  1925.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  20.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.023
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        6.48      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    6.48      SUBAREA RUNOFF(CFS) =   10.10
  EFFECTIVE AREA(ACRES) =     9.80   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9.80       PEAK FLOW RATE(CFS) =      15.28

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    503.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3009.80  DOWNSTREAM(FEET) =   2998.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   501.00   CHANNEL SLOPE =  0.0231
  CHANNEL FLOW THRU SUBAREA(CFS) =     15.28
  FLOW VELOCITY(FEET/SEC) =   4.24 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.97   Tc(MIN.) =  22.09
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    503.00 =  2426.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  22.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.912
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        3.68      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    3.68      SUBAREA RUNOFF(CFS) =    5.37
  EFFECTIVE AREA(ACRES) =    13.48   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    13.48       PEAK FLOW RATE(CFS) =      19.68
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     13.48  TC(MIN.) =     22.09
  EFFECTIVE AREA(ACRES) =     13.48  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     19.68
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 600-603)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E600.DAT
  TIME/DATE OF STUDY: 13:28 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =   3062.24  DOWNSTREAM(FEET) =   3033.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   16.864
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.249
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        4.86      0.29      1.00    85   16.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      8.57
  TOTAL AREA(ACRES) =      4.86   PEAK FLOW RATE(CFS) =      8.57

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3033.00  DOWNSTREAM(FEET) =   3011.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   795.00   CHANNEL SLOPE =  0.0268
  CHANNEL FLOW THRU SUBAREA(CFS) =      8.57
  FLOW VELOCITY(FEET/SEC) =   3.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.37   Tc(MIN.) =  20.23
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =  1795.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    602.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  20.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.016
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        6.87      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    6.87      SUBAREA RUNOFF(CFS) =   10.67
  EFFECTIVE AREA(ACRES) =    11.73   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    11.73       PEAK FLOW RATE(CFS) =      18.22

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    603.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3011.70  DOWNSTREAM(FEET) =   3003.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   370.00   CHANNEL SLOPE =  0.0214
  CHANNEL FLOW THRU SUBAREA(CFS) =     18.22
  FLOW VELOCITY(FEET/SEC) =   4.27 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =  21.68
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    603.00 =  2165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    603.00 TO NODE    603.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  21.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.934
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        3.37      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    3.37      SUBAREA RUNOFF(CFS) =    4.99
  EFFECTIVE AREA(ACRES) =    15.10   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =    15.10       PEAK FLOW RATE(CFS) =      22.34
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     15.10  TC(MIN.) =     21.68
  EFFECTIVE AREA(ACRES) =     15.10  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     22.34
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* EXISTING CONDITION (NODES 700-702)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\E700.DAT
  TIME/DATE OF STUDY: 13:32 08/15/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   854.00
  ELEVATION DATA: UPSTREAM(FEET) =   3055.46  DOWNSTREAM(FEET) =   3028.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.580
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.358
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        4.20      0.29      1.00    85   15.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA RUNOFF(CFS) =      7.82
  TOTAL AREA(ACRES) =      4.20   PEAK FLOW RATE(CFS) =      7.82

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    702.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3028.40  DOWNSTREAM(FEET) =   3023.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00   CHANNEL SLOPE =  0.0282
  CHANNEL FLOW THRU SUBAREA(CFS) =      7.82
  FLOW VELOCITY(FEET/SEC) =   3.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.76   Tc(MIN.) =  16.34
  LONGEST FLOWPATH FROM NODE    700.00 TO NODE    702.00 =  1035.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    702.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  16.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.291
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL DESERT COVER
  "MOUNTAIN BRUSH" (20.0%)   C        4.81      0.29      1.00    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.00
  SUBAREA AREA(ACRES) =    4.81      SUBAREA RUNOFF(CFS) =    8.66
  EFFECTIVE AREA(ACRES) =     9.01   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =     9.01       PEAK FLOW RATE(CFS) =      16.23
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      9.01  TC(MIN.) =     16.34
  EFFECTIVE AREA(ACRES) =      9.01  AREA-AVERAGED Fm(INCH/HR)=  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  1.00
  PEAK FLOW RATE(CFS)   =     16.23
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

PROPOSED CONDITION

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 100-213)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P100.DAT
  TIME/DATE OF STUDY: 08:32 08/14/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   695.00
  ELEVATION DATA: UPSTREAM(FEET) =   3017.41  DOWNSTREAM(FEET) =   3004.12

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.191
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.236
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       4.48      0.57      0.10    69    9.19
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =     12.82
  TOTAL AREA(ACRES) =      4.48   PEAK FLOW RATE(CFS) =     12.82

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3000.12  DOWNSTREAM(FEET) =  2999.99
  FLOW LENGTH(FEET) =    25.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.01
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     12.82
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   9.26
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =   720.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.222
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.30      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.30      SUBAREA RUNOFF(CFS) =    3.70
  EFFECTIVE AREA(ACRES) =     5.78   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     5.78       PEAK FLOW RATE(CFS) =      16.47

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.222
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.42      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.42      SUBAREA RUNOFF(CFS) =    6.89
  EFFECTIVE AREA(ACRES) =     8.20   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     8.20       PEAK FLOW RATE(CFS) =      23.36

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2999.99  DOWNSTREAM(FEET) =  2987.04
  FLOW LENGTH(FEET) =   198.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     23.36
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   9.44
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =   918.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.184
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        3.86      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    3.86      SUBAREA RUNOFF(CFS) =   10.86
  EFFECTIVE AREA(ACRES) =    12.06   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    12.06       PEAK FLOW RATE(CFS) =      33.95

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2987.04  DOWNSTREAM(FEET) =  2986.44
  FLOW LENGTH(FEET) =   119.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.50
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     33.95
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   9.71
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =  1037.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.132
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.54      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.54      SUBAREA RUNOFF(CFS) =    4.26
  EFFECTIVE AREA(ACRES) =    13.60   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    13.60       PEAK FLOW RATE(CFS) =      37.64

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2986.44  DOWNSTREAM(FEET) =  2984.24
  FLOW LENGTH(FEET) =   441.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.56
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     37.64
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =  10.68
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =  1478.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.68
  RAINFALL INTENSITY(INCH/HR) =   2.96
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =   13.60
  TOTAL STREAM AREA(ACRES) =   13.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.64

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   555.00
  ELEVATION DATA: UPSTREAM(FEET) =   2999.21  DOWNSTREAM(FEET) =   2988.21

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.340
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.431
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        5.36      0.57      0.10    69    8.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =     16.28
  TOTAL AREA(ACRES) =      5.36   PEAK FLOW RATE(CFS) =     16.28

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2985.21  DOWNSTREAM(FEET) =  2984.24
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.74
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     16.28
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   8.44
  LONGEST FLOWPATH FROM NODE    105.00 TO NODE    107.00 =   615.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.44
  RAINFALL INTENSITY(INCH/HR) =   3.41
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =    5.36
  TOTAL STREAM AREA(ACRES) =    5.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.28

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     37.64  10.68    2.957  0.57( 0.06) 0.10    13.6     100.00
      2     16.28   8.44    3.406  0.57( 0.06) 0.10     5.4     105.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     51.74  10.68    2.957  0.57( 0.06) 0.10    19.0     100.00
      2     50.62   8.44    3.406  0.57( 0.06) 0.10    16.1     105.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     51.74    Tc(MIN.) =    10.68
  EFFECTIVE AREA(ACRES) =    18.96   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     18.96
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =  1478.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2984.24  DOWNSTREAM(FEET) =  2982.73
  FLOW LENGTH(FEET) =   304.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.30
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     51.74
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =  11.29
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =  1782.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.860
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.24      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.24      SUBAREA RUNOFF(CFS) =   10.70
  EFFECTIVE AREA(ACRES) =    23.20   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    23.20       PEAK FLOW RATE(CFS) =      58.54

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     58.54  11.29    2.860  0.57( 0.06) 0.10    23.2     100.00
      2     58.77   9.06    3.265  0.57( 0.06) 0.10    20.3     105.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     58.77  Tc(MIN.) =   9.06
  AREA-AVERAGED Fm(INCH/HR) =  0.06  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10  EFFECTIVE AREA(ACRES) =     20.35

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2982.73  DOWNSTREAM(FEET) =  2981.22
  FLOW LENGTH(FEET) =   304.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.43
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     58.77
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =   9.66
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =  2086.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.66
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.142
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        3.37      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    3.37      SUBAREA RUNOFF(CFS) =    9.36
  EFFECTIVE AREA(ACRES) =    23.72   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    26.57       PEAK FLOW RATE(CFS) =      65.87

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2981.22  DOWNSTREAM(FEET) =  2980.64
```

```
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.81
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     65.87
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   9.88
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =  2202.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.100
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.44      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.44      SUBAREA RUNOFF(CFS) =   12.16
  EFFECTIVE AREA(ACRES) =    28.16   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    31.01       PEAK FLOW RATE(CFS) =      77.13

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   529.00
  ELEVATION DATA: UPSTREAM(FEET) =   3023.18  DOWNSTREAM(FEET) =   3013.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.230
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.458
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        0.39      0.57      0.10    69    8.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      1.19
  TOTAL AREA(ACRES) =      0.39   PEAK FLOW RATE(CFS) =      1.19

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 3013.00  DOWNSTREAM ELEVATION(FEET) = 2990.59
  STREET LENGTH(FEET) =   508.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  15.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0149

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.02
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
```

```
    HALFSTREET FLOOD WIDTH(FEET) =   10.82
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.93
  STREET FLOW TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =   9.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.101
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.25      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.25      SUBAREA RUNOFF(CFS) =   11.64
  EFFECTIVE AREA(ACRES) =    4.64    AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    4.64        PEAK FLOW RATE(CFS) =      12.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  14.06
  FLOW VELOCITY(FEET/SEC.) =  5.87   DEPTH*VELOCITY(FT*FT/SEC.) =   2.58
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =  1037.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.101
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.61      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    4.41
  EFFECTIVE AREA(ACRES) =     6.25   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     6.25       PEAK FLOW RATE(CFS) =      17.12

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2986.65  DOWNSTREAM(FEET) =  2986.17
  FLOW LENGTH(FEET) =   137.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.50
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     17.12
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =  10.29
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =  1174.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.025
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.09      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.09      SUBAREA RUNOFF(CFS) =    5.58
  EFFECTIVE AREA(ACRES) =     8.34   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     8.34       PEAK FLOW RATE(CFS) =      22.28

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

```
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2986.17  DOWNSTREAM(FEET) =  2985.76
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.90
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     22.28
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =  10.61
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =  1290.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.969
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.61      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    4.22
  EFFECTIVE AREA(ACRES) =     9.95   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     9.95       PEAK FLOW RATE(CFS) =      26.08

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2985.76  DOWNSTREAM(FEET) =  2985.35
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.19
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     26.08
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =  10.93
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    205.00 =  1406.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.93
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.917
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.61      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    4.15
  EFFECTIVE AREA(ACRES) =    11.56   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    11.56       PEAK FLOW RATE(CFS) =      29.76

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2985.35  DOWNSTREAM(FEET) =  2984.94
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
```

```
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.32
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     29.76
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =  11.23
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    206.00 =  1522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    206.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.870
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C       1.16      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.16      SUBAREA RUNOFF(CFS) =    2.94
  EFFECTIVE AREA(ACRES) =    12.72   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    12.72       PEAK FLOW RATE(CFS) =      32.20

****************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2984.94  DOWNSTREAM(FEET) =  2984.53
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.37
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     32.20
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =  11.54
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    207.00 =  1638.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.54
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.824
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C       1.61      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    4.01
  EFFECTIVE AREA(ACRES) =    14.33   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    14.33       PEAK FLOW RATE(CFS) =      35.69

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    208.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2984.53  DOWNSTREAM(FEET) =  2984.12
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.65
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     35.69
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =  11.83
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    208.00 =  1754.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.83
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.782
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.61      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    3.95
  EFFECTIVE AREA(ACRES) =    15.94   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    15.94       PEAK FLOW RATE(CFS) =      39.10

****************************************************************************
  FLOW PROCESS FROM NODE    208.00 TO NODE    209.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2983.72  DOWNSTREAM(FEET) =  2983.31
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.73
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     39.10
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =  12.11
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    209.00 =  1870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    209.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.61      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.61      SUBAREA RUNOFF(CFS) =    3.89
  EFFECTIVE AREA(ACRES) =    17.55   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    17.55       PEAK FLOW RATE(CFS) =      42.42

****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    210.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2983.31  DOWNSTREAM(FEET) =  2982.90
  FLOW LENGTH(FEET) =   116.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  26.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.97
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     42.42
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  12.39
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    210.00 =  1986.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    210.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.705
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.88      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.88      SUBAREA RUNOFF(CFS) =    6.87
  EFFECTIVE AREA(ACRES) =    20.43   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    20.43       PEAK FLOW RATE(CFS) =      48.70

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2982.90  DOWNSTREAM(FEET) =  2980.79
  FLOW LENGTH(FEET) =   604.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.07
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     48.70
  PIPE TRAVEL TIME(MIN.) =   1.42    Tc(MIN.) =  13.82
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    211.00 =  2590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    211.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  13.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.534
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.04      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    2.32
  EFFECTIVE AREA(ACRES) =    21.47   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    21.47       PEAK FLOW RATE(CFS) =      48.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    212.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2980.79  DOWNSTREAM(FEET) =  2979.33
  FLOW LENGTH(FEET) =   416.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.08
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     48.70
  PIPE TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =  14.79
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    212.00 =  3006.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  14.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.432
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.35      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
```

```
  SUBAREA AREA(ACRES) =    1.35      SUBAREA RUNOFF(CFS) =    2.89
  EFFECTIVE AREA(ACRES) =    22.82   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    22.82       PEAK FLOW RATE(CFS) =      48.79

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    213.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2979.33  DOWNSTREAM(FEET) =  2977.52
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.88
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     48.79
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =  14.90
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    213.00 =  3096.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  14.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.87      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.87      SUBAREA RUNOFF(CFS) =    1.85
  EFFECTIVE AREA(ACRES) =    23.69   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    23.69       PEAK FLOW RATE(CFS) =      50.43

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  14.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.422
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.68      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.68      SUBAREA RUNOFF(CFS) =    3.58
  EFFECTIVE AREA(ACRES) =    25.37   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    25.37       PEAK FLOW RATE(CFS) =      54.00

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     54.00  14.90    2.422  0.57( 0.06) 0.10    25.4     200.00
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    213.00 =  3096.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     77.13   9.88    3.100  0.57( 0.06) 0.10    28.2     105.00
      2     74.96  12.11    2.742  0.57( 0.06) 0.10    31.0     100.00
```

```
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE    213.00 =     0.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    120.01  14.90    2.422  0.57( 0.06) 0.10    56.4     200.00
      2    123.18   9.88    3.100  0.57( 0.06) 0.10    45.0     105.00
      3    124.80  12.11    2.742  0.57( 0.06) 0.10    51.6     100.00
    TOTAL AREA(ACRES) =     56.38

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      124.80  Tc(MIN.) =   12.113
  EFFECTIVE AREA(ACRES) =     51.63  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     56.38
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    213.00 =  3096.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.742
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.31      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.31      SUBAREA RUNOFF(CFS) =   10.42
  EFFECTIVE AREA(ACRES) =    55.94   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    60.69       PEAK FLOW RATE(CFS) =     135.22
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     60.69  TC(MIN.) =     12.11
  EFFECTIVE AREA(ACRES) =     55.94  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =    135.22

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    134.98   9.88    3.100  0.57( 0.06) 0.10    49.3     105.00
      2    135.22  12.11    2.742  0.57( 0.06) 0.10    55.9     100.00
      3    129.19  14.90    2.422  0.57( 0.06) 0.10    60.7     200.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             Ver. 8.0  Release Date: 01/01/99  License ID 1435

                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 300-307)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P300.DAT
  TIME/DATE OF STUDY: 15:38 08/13/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   537.00
  ELEVATION DATA: UPSTREAM(FEET) =   3018.42  DOWNSTREAM(FEET) =   3010.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.786
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.325
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        6.78      0.57      0.10    69    8.79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =     19.94
  TOTAL AREA(ACRES) =      6.78   PEAK FLOW RATE(CFS) =     19.94

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3006.74  DOWNSTREAM(FEET) =  3000.73
  FLOW LENGTH(FEET) =    17.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.19
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     19.94
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   8.79
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =   554.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.323
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.62      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.62      SUBAREA RUNOFF(CFS) =    4.76
  EFFECTIVE AREA(ACRES) =     8.40   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     8.40       PEAK FLOW RATE(CFS) =      24.69

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.323
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.30      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.30      SUBAREA RUNOFF(CFS) =    3.82
  EFFECTIVE AREA(ACRES) =     9.70   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     9.70       PEAK FLOW RATE(CFS) =      28.52

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3000.73  DOWNSTREAM(FEET) =  2999.79
  FLOW LENGTH(FEET) =   268.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.26
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     28.52
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   9.51
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =   822.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.171
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.21      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.21      SUBAREA RUNOFF(CFS) =   11.80
  EFFECTIVE AREA(ACRES) =    13.91   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    13.91       PEAK FLOW RATE(CFS) =      38.99

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2999.79  DOWNSTREAM(FEET) =  2998.85
  FLOW LENGTH(FEET) =   268.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.71
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     38.99
  PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =  10.17
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =  1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.045
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.70      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.70      SUBAREA RUNOFF(CFS) =   12.64
  EFFECTIVE AREA(ACRES) =    18.61   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    18.61       PEAK FLOW RATE(CFS) =      50.05

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    305.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2998.85  DOWNSTREAM(FEET) =  2997.91
  FLOW LENGTH(FEET) =   268.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.09
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     50.05
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =  10.80
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    305.00 =  1358.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.937
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.51      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.51      SUBAREA RUNOFF(CFS) =   11.69
  EFFECTIVE AREA(ACRES) =    23.12   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    23.12       PEAK FLOW RATE(CFS) =      59.94

****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    306.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2997.91  DOWNSTREAM(FEET) =  2996.97
  FLOW LENGTH(FEET) =   268.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.44
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     59.94
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =  11.40
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    306.00 =  1626.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.843
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.39      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.39      SUBAREA RUNOFF(CFS) =   11.01
  EFFECTIVE AREA(ACRES) =    27.51   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    27.51       PEAK FLOW RATE(CFS) =      69.00

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    307.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2996.97  DOWNSTREAM(FEET) =  2983.11
  FLOW LENGTH(FEET) =   387.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.71
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     69.00
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =  11.75
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    307.00 =  2013.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.793
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.28      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.28      SUBAREA RUNOFF(CFS) =    5.62
  EFFECTIVE AREA(ACRES) =    29.79   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    29.79       PEAK FLOW RATE(CFS) =      73.37
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     29.79  TC(MIN.) =     11.75
  EFFECTIVE AREA(ACRES) =     29.79  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =     73.37
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             Ver. 8.0  Release Date: 01/01/99  License ID 1435

                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 400-435)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P400.DAT
  TIME/DATE OF STUDY: 15:38 08/13/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   459.00
  ELEVATION DATA: UPSTREAM(FEET) =   3021.09  DOWNSTREAM(FEET) =   3013.01

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.915
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.540
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       2.83      0.57      0.10    69    7.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      8.87
  TOTAL AREA(ACRES) =      2.83   PEAK FLOW RATE(CFS) =      8.87

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3009.01  DOWNSTREAM(FEET) =  3008.22
  FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.35
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      8.87
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   7.95
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    402.00 =   481.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.26      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.26      SUBAREA RUNOFF(CFS) =    3.94
  EFFECTIVE AREA(ACRES) =     4.09   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     4.09       PEAK FLOW RATE(CFS) =      12.79

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.79      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    2.47
  EFFECTIVE AREA(ACRES) =     4.88   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     4.88       PEAK FLOW RATE(CFS) =      15.26

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.27      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.27      SUBAREA RUNOFF(CFS) =    3.97
  EFFECTIVE AREA(ACRES) =     6.15   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     6.15       PEAK FLOW RATE(CFS) =      19.23

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.531
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.69      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.69      SUBAREA RUNOFF(CFS) =    2.16
  EFFECTIVE AREA(ACRES) =     6.84   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     6.84       PEAK FLOW RATE(CFS) =      21.39
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3008.22  DOWNSTREAM(FEET) =  3006.62
  FLOW LENGTH(FEET) =   386.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.26
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     21.39
  PIPE TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =   8.98
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    403.00 =   867.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.98
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.283
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.63      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.63      SUBAREA RUNOFF(CFS) =    7.64
  EFFECTIVE AREA(ACRES) =     9.47   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     9.47       PEAK FLOW RATE(CFS) =      27.50

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    404.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3006.62  DOWNSTREAM(FEET) =  3006.05
  FLOW LENGTH(FEET) =   163.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.22
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     27.50
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   9.41
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    404.00 =  1030.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.191
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.49      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.49      SUBAREA RUNOFF(CFS) =    1.38
  EFFECTIVE AREA(ACRES) =     9.96   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     9.96       PEAK FLOW RATE(CFS) =      28.09

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    412.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3006.05  DOWNSTREAM(FEET) =  3005.24
```

```
  FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.99
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     28.09
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =  10.12
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    412.00 =  1285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    412.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.12
  RAINFALL INTENSITY(INCH/HR) =   3.05
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =    9.96
  TOTAL STREAM AREA(ACRES) =    9.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.09

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    411.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   328.00
  ELEVATION DATA: UPSTREAM(FEET) =   3023.39  DOWNSTREAM(FEET) =   3010.71

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.913
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.217
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        5.36      0.57      0.10    69    5.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =     20.07
  TOTAL AREA(ACRES) =      5.36   PEAK FLOW RATE(CFS) =     20.07

****************************************************************************
  FLOW PROCESS FROM NODE    411.00 TO NODE    412.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3006.71  DOWNSTREAM(FEET) =  3005.24
  FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.94
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     20.07
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   5.94
  LONGEST FLOWPATH FROM NODE    410.00 TO NODE    412.00 =   356.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    412.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   5.94
  RAINFALL INTENSITY(INCH/HR) =   4.20
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
```

```
  EFFECTIVE STREAM AREA(ACRES) =    5.36
  TOTAL STREAM AREA(ACRES) =    5.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.07

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     28.09  10.12    3.054  0.57( 0.06) 0.10    10.0     400.00
      2     20.07   5.94    4.205  0.57( 0.06) 0.10     5.4     410.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     42.60  10.12    3.054  0.57( 0.06) 0.10    15.3     400.00
      2     42.89   5.94    4.205  0.57( 0.06) 0.10    11.2     410.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     42.89    Tc(MIN.) =     5.94
  EFFECTIVE AREA(ACRES) =    11.21   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     15.32
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    412.00 =  1285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    413.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3005.24  DOWNSTREAM(FEET) =  3004.71
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.96
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     42.89
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   6.30
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    413.00 =  1436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    413.00 TO NODE    413.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   6.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.84      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =    6.63
  EFFECTIVE AREA(ACRES) =    13.05   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    17.16       PEAK FLOW RATE(CFS) =      46.99

****************************************************************************
  FLOW PROCESS FROM NODE    413.00 TO NODE    414.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3004.71  DOWNSTREAM(FEET) =  3004.18
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     46.99
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   6.66
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    414.00 =  1587.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    414.00 TO NODE    414.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   6.66
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.25      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.25      SUBAREA RUNOFF(CFS) =    7.84
  EFFECTIVE AREA(ACRES) =    15.30   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    19.41       PEAK FLOW RATE(CFS) =      53.28

****************************************************************************
  FLOW PROCESS FROM NODE    414.00 TO NODE    415.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3004.18  DOWNSTREAM(FEET) =  3003.66
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.28
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     53.28
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   7.01
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    415.00 =  1738.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    415.00 TO NODE    415.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.809
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.84      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =    6.21
  EFFECTIVE AREA(ACRES) =    17.14   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    21.25       PEAK FLOW RATE(CFS) =      57.87

****************************************************************************
  FLOW PROCESS FROM NODE    415.00 TO NODE    416.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3003.66  DOWNSTREAM(FEET) =  3003.13
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.42
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     57.87
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   7.34
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    416.00 =  1889.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    416.00 TO NODE    416.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.34
```

```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.25      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.25      SUBAREA RUNOFF(CFS) =    7.38
  EFFECTIVE AREA(ACRES) =    19.39   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    23.50       PEAK FLOW RATE(CFS) =      63.61

****************************************************************************
  FLOW PROCESS FROM NODE    416.00 TO NODE    417.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3003.13  DOWNSTREAM(FEET) =  3002.60
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  31.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.67
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     63.61
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   7.67
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    417.00 =  2040.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    417.00 TO NODE    417.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.607
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.26      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.26      SUBAREA RUNOFF(CFS) =    7.22
  EFFECTIVE AREA(ACRES) =    21.65   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    25.76       PEAK FLOW RATE(CFS) =      69.16

****************************************************************************
  FLOW PROCESS FROM NODE    417.00 TO NODE    418.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3002.60  DOWNSTREAM(FEET) =  3002.07
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.77
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     69.16
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   8.00
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    418.00 =  2191.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    418.00 TO NODE    418.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.518
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.84      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
```

```
  SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =    5.73
  EFFECTIVE AREA(ACRES) =    23.49   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    27.60       PEAK FLOW RATE(CFS) =      73.17

****************************************************************************
  FLOW PROCESS FROM NODE    418.00 TO NODE    419.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3002.07  DOWNSTREAM(FEET) =  3001.54
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  35.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.80
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     73.17
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   8.32
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    419.00 =  2342.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    419.00 TO NODE    419.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.436
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.25      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.25      SUBAREA RUNOFF(CFS) =    6.84
  EFFECTIVE AREA(ACRES) =    25.74   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    29.85       PEAK FLOW RATE(CFS) =      78.27

****************************************************************************
  FLOW PROCESS FROM NODE    419.00 TO NODE    420.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3001.54  DOWNSTREAM(FEET) =  3001.02
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.99
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     78.27
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   8.63
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    420.00 =  2493.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    420.00 TO NODE    420.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.360
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.84      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =    5.47
  EFFECTIVE AREA(ACRES) =    27.58   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    31.69       PEAK FLOW RATE(CFS) =      81.99

****************************************************************************
  FLOW PROCESS FROM NODE    420.00 TO NODE    421.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3001.02  DOWNSTREAM(FEET) =  3000.49
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.11
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     81.99
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   8.94
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    421.00 =  2644.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    421.00 TO NODE    421.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.290
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        3.63      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    3.63      SUBAREA RUNOFF(CFS) =   10.56
  EFFECTIVE AREA(ACRES) =    31.21   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    35.32       PEAK FLOW RATE(CFS) =      90.80

****************************************************************************
  FLOW PROCESS FROM NODE    421.00 TO NODE    422.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3000.49  DOWNSTREAM(FEET) =  3000.18
  FLOW LENGTH(FEET) =    88.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.39
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     90.80
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   9.12
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    422.00 =  2732.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    422.00 TO NODE    422.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.252
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.85      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.85      SUBAREA RUNOFF(CFS) =    2.44
  EFFECTIVE AREA(ACRES) =    32.06   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    36.17       PEAK FLOW RATE(CFS) =      92.18

****************************************************************************
  FLOW PROCESS FROM NODE    422.00 TO NODE    423.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3000.18  DOWNSTREAM(FEET) =  2999.47
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.1 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.34
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     92.18
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   9.53
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    423.00 =  2937.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    423.00 TO NODE    423.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.167
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.36      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.36      SUBAREA RUNOFF(CFS) =    1.01
  EFFECTIVE AREA(ACRES) =    32.42   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    36.53       PEAK FLOW RATE(CFS) =      92.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    423.00 TO NODE    424.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2999.47  DOWNSTREAM(FEET) =  2998.59
  FLOW LENGTH(FEET) =   251.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.39
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     92.18
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =  10.03
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    424.00 =  3188.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    424.00 TO NODE    424.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.072
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.15      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    3.12
  EFFECTIVE AREA(ACRES) =    33.57   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    37.68       PEAK FLOW RATE(CFS) =      92.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    424.00 TO NODE    435.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2998.59  DOWNSTREAM(FEET) =  2994.06
  FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.02
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     92.18
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =  10.13
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    435.00 =  3315.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    435.00 TO NODE    435.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.13
  RAINFALL INTENSITY(INCH/HR) =   3.05
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =   33.57
  TOTAL STREAM AREA(ACRES) =   37.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     92.18

****************************************************************************
  FLOW PROCESS FROM NODE    430.00 TO NODE    431.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   309.00
  ELEVATION DATA: UPSTREAM(FEET) =   3010.37  DOWNSTREAM(FEET) =   3004.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.567
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.960
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        1.03      0.57      0.10    69    6.57
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      3.62
  TOTAL AREA(ACRES) =      1.03   PEAK FLOW RATE(CFS) =      3.62

****************************************************************************
  FLOW PROCESS FROM NODE    431.00 TO NODE    432.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3000.10  DOWNSTREAM(FEET) =  2999.88
  FLOW LENGTH(FEET) =    56.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.91
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      3.62
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   6.81
  LONGEST FLOWPATH FROM NODE    430.00 TO NODE    432.00 =   365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    432.00 TO NODE    432.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   6.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.876
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.26      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.26      SUBAREA RUNOFF(CFS) =    4.33
  EFFECTIVE AREA(ACRES) =     2.29   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     2.29       PEAK FLOW RATE(CFS) =       7.87

****************************************************************************
  FLOW PROCESS FROM NODE    432.00 TO NODE    433.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2999.88  DOWNSTREAM(FEET) =  2999.53
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.26
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      7.87
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   7.03
  LONGEST FLOWPATH FROM NODE    430.00 TO NODE    433.00 =   435.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    433.00 TO NODE    433.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.802
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.79      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    2.66
  EFFECTIVE AREA(ACRES) =     3.08   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     3.08       PEAK FLOW RATE(CFS) =      10.38

****************************************************************************
  FLOW PROCESS FROM NODE    433.00 TO NODE    433.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.802
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.87      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.87      SUBAREA RUNOFF(CFS) =    2.93
  EFFECTIVE AREA(ACRES) =     3.95   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     3.95       PEAK FLOW RATE(CFS) =      13.31

****************************************************************************
  FLOW PROCESS FROM NODE    433.00 TO NODE    434.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2999.88  DOWNSTREAM(FEET) =  2994.34
  FLOW LENGTH(FEET) =   289.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     13.31
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =   7.52
  LONGEST FLOWPATH FROM NODE    430.00 TO NODE    434.00 =   724.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    434.00 TO NODE    434.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.650
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                C        0.67      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.67      SUBAREA RUNOFF(CFS) =    2.17
  EFFECTIVE AREA(ACRES) =     4.62   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     4.62       PEAK FLOW RATE(CFS) =      14.94

****************************************************************************
  FLOW PROCESS FROM NODE    434.00 TO NODE    435.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2994.34  DOWNSTREAM(FEET) =  2994.06
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     14.94
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   7.53
  LONGEST FLOWPATH FROM NODE    430.00 TO NODE    435.00 =   732.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    435.00 TO NODE    435.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   7.53
  RAINFALL INTENSITY(INCH/HR) =   3.65
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =    4.62
  TOTAL STREAM AREA(ACRES) =    4.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.94

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     82.32  14.41    2.471  0.57( 0.06) 0.10    37.7     400.00
      1     92.18  10.13    3.052  0.57( 0.06) 0.10    33.6     410.00
      2     14.94   7.53    3.647  0.57( 0.06) 0.10     4.6     430.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    104.65  10.13    3.052  0.57( 0.06) 0.10    38.2     410.00
      2     92.36  14.41    2.471  0.57( 0.06) 0.10    42.3     400.00
      3     97.05   7.53    3.647  0.57( 0.06) 0.10    29.6     430.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    104.65    Tc(MIN.) =    10.13
  EFFECTIVE AREA(ACRES) =    38.19   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     42.30
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    435.00 =  3315.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    435.00 TO NODE    435.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.052
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        3.07      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    3.07      SUBAREA RUNOFF(CFS) =    8.28
  EFFECTIVE AREA(ACRES) =    41.26   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    45.37       PEAK FLOW RATE(CFS) =     111.23
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     45.37  TC(MIN.) =     10.13
  EFFECTIVE AREA(ACRES) =     41.26  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =    111.23

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    105.47   7.53    3.647  0.57( 0.06) 0.10    32.6     430.00
      2    111.23  10.13    3.052  0.57( 0.06) 0.10    41.3     410.00
      3     98.58  14.41    2.471  0.57( 0.06) 0.10    45.4     400.00
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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            Ver. 8.0  Release Date: 01/01/99  License ID 1435

                         Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 500-613)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P500.DAT
  TIME/DATE OF STUDY: 09:11 08/14/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   450.00
  ELEVATION DATA: UPSTREAM(FEET) =   3053.81  DOWNSTREAM(FEET) =   3046.86

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.061
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.501
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       3.16      0.57      0.10    69    8.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      9.80
  TOTAL AREA(ACRES) =      3.16   PEAK FLOW RATE(CFS) =      9.80

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    502.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3042.86  DOWNSTREAM(FEET) =  3041.58
  FLOW LENGTH(FEET) =   505.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.27
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      9.80
  PIPE TRAVEL TIME(MIN.) =   1.97    Tc(MIN.) =  10.03
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    502.00 =   955.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.070
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.82      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.82      SUBAREA RUNOFF(CFS) =    2.22
  EFFECTIVE AREA(ACRES) =     3.98   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     3.98       PEAK FLOW RATE(CFS) =      10.80

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.070
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.39      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.39      SUBAREA RUNOFF(CFS) =    3.77
  EFFECTIVE AREA(ACRES) =     5.37   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     5.37       PEAK FLOW RATE(CFS) =      14.57

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.070
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.17      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.17      SUBAREA RUNOFF(CFS) =    5.89
  EFFECTIVE AREA(ACRES) =     7.54   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     7.54       PEAK FLOW RATE(CFS) =      20.45

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    505.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3041.58  DOWNSTREAM(FEET) =  3039.52
  FLOW LENGTH(FEET) =   392.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.71
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     20.45
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =  11.01
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    505.00 =  1347.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    505.00 TO NODE    505.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.01
  RAINFALL INTENSITY(INCH/HR) =   2.90
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =    7.54
  TOTAL STREAM AREA(ACRES) =    7.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.45

******************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    504.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   629.00
  ELEVATION DATA: UPSTREAM(FEET) =   3052.15  DOWNSTREAM(FEET) =   3043.91

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.525
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.168
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        6.01      0.57      0.10    69    9.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =     16.83
  TOTAL AREA(ACRES) =      6.01   PEAK FLOW RATE(CFS) =     16.83

******************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    505.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3040.92  DOWNSTREAM(FEET) =  3039.52
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.47
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     16.83
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   9.77
  LONGEST FLOWPATH FROM NODE    503.00 TO NODE    505.00 =   751.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    505.00 TO NODE    505.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   9.77
  RAINFALL INTENSITY(INCH/HR) =   3.12
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =    6.01
  TOTAL STREAM AREA(ACRES) =    6.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.83

  ** CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
      1     20.45  11.01    2.904  0.57( 0.06) 0.10     7.5     500.00
      2     16.83   9.77    3.121  0.57( 0.06) 0.10     6.0     503.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     36.09  11.01    2.904  0.57( 0.06) 0.10    13.6     500.00
      2     36.35   9.77    3.121  0.57( 0.06) 0.10    12.7     503.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     36.35    Tc(MIN.) =     9.77
  EFFECTIVE AREA(ACRES) =    12.70   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     13.55
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    505.00 =  1347.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    505.00 TO NODE    506.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3039.52  DOWNSTREAM(FEET) =  3037.95
  FLOW LENGTH(FEET) =   301.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.69
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     36.35
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =  10.42
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    506.00 =  1648.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    506.00 TO NODE    506.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.002
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.15      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.15      SUBAREA RUNOFF(CFS) =   11.00
  EFFECTIVE AREA(ACRES) =    16.85   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    17.70       PEAK FLOW RATE(CFS) =      44.66

****************************************************************************
  FLOW PROCESS FROM NODE    506.00 TO NODE    507.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3037.95  DOWNSTREAM(FEET) =  3036.37
  FLOW LENGTH(FEET) =   301.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.14
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     44.66
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =  11.03
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    507.00 =  1949.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    507.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.900
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  COMMERCIAL                 C        4.64      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.64      SUBAREA RUNOFF(CFS) =   11.87
  EFFECTIVE AREA(ACRES) =    21.49   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    22.34       PEAK FLOW RATE(CFS) =      54.99

****************************************************************************
  FLOW PROCESS FROM NODE    507.00 TO NODE    508.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3036.37  DOWNSTREAM(FEET) =  3034.79
  FLOW LENGTH(FEET) =   302.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.57
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     54.99
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =  11.62
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    508.00 =  2251.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    508.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  11.62
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.811
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        4.15      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    4.15      SUBAREA RUNOFF(CFS) =   10.29
  EFFECTIVE AREA(ACRES) =    25.64   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    26.49       PEAK FLOW RATE(CFS) =      63.56

****************************************************************************
  FLOW PROCESS FROM NODE    508.00 TO NODE    509.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3034.79  DOWNSTREAM(FEET) =  3032.14
  FLOW LENGTH(FEET) =   301.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.65
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     63.56
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =  12.09
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    509.00 =  2552.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    509.00 TO NODE    509.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.745
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        5.41      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    5.41      SUBAREA RUNOFF(CFS) =   13.09
  EFFECTIVE AREA(ACRES) =    31.05   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    31.90       PEAK FLOW RATE(CFS) =      75.13
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    509.00 TO NODE    510.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3032.14  DOWNSTREAM(FEET) =  3027.88
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.75
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     75.13
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =  12.36
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    510.00 =  2792.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    510.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.709
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.14      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.14      SUBAREA RUNOFF(CFS) =    2.72
  EFFECTIVE AREA(ACRES) =    32.19   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    33.04       PEAK FLOW RATE(CFS) =      76.83

****************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    510.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.709
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.58      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.58      SUBAREA RUNOFF(CFS) =    3.77
  EFFECTIVE AREA(ACRES) =    33.77   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    34.62       PEAK FLOW RATE(CFS) =      80.60

****************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    510.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  12.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.709
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.65      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    1.55
  EFFECTIVE AREA(ACRES) =    34.42   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    35.27       PEAK FLOW RATE(CFS) =      82.16

****************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    510.00 IS CODE =  10
----------------------------------------------------------------------------
```

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

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   569.00
  ELEVATION DATA: UPSTREAM(FEET) =   3075.43  DOWNSTREAM(FEET) =   3046.09

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.957
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.825
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        3.75      0.57      0.10    69    6.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =     12.72
  TOTAL AREA(ACRES) =      3.75   PEAK FLOW RATE(CFS) =     12.72

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3043.09  DOWNSTREAM(FEET) =  3041.96
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.88
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     12.72
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   6.99
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =   596.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    602.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   6.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.813
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.51      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.51      SUBAREA RUNOFF(CFS) =    5.11
  EFFECTIVE AREA(ACRES) =     5.26   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     5.26       PEAK FLOW RATE(CFS) =      17.78

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    603.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3041.96  DOWNSTREAM(FEET) =  3041.22
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.38
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     17.78
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   7.38
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    603.00 =   746.00 FEET.

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

```
  FLOW PROCESS FROM NODE    603.00 TO NODE    603.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.691
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.68      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.68      SUBAREA RUNOFF(CFS) =    5.49
  EFFECTIVE AREA(ACRES) =     6.94   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     6.94       PEAK FLOW RATE(CFS) =      22.70

****************************************************************************
  FLOW PROCESS FROM NODE    603.00 TO NODE    604.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3041.22  DOWNSTREAM(FEET) =  3040.45
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.71
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     22.70
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   7.76
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    604.00 =   896.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    604.00 TO NODE    604.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   7.76
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.583
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.09      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.09      SUBAREA RUNOFF(CFS) =    6.63
  EFFECTIVE AREA(ACRES) =     9.03   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     9.03       PEAK FLOW RATE(CFS) =      28.66

****************************************************************************
  FLOW PROCESS FROM NODE    604.00 TO NODE    605.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3040.45  DOWNSTREAM(FEET) =  3039.71
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.05
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     28.66
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   8.11
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    605.00 =  1046.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    605.00 TO NODE    605.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.488
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.68      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.68      SUBAREA RUNOFF(CFS) =    5.19
  EFFECTIVE AREA(ACRES) =    10.71   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    10.71       PEAK FLOW RATE(CFS) =      33.08

****************************************************************************
  FLOW PROCESS FROM NODE    605.00 TO NODE    606.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3039.71  DOWNSTREAM(FEET) =  3038.95
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.49
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     33.08
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   8.45
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    606.00 =  1196.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    606.00 TO NODE    606.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.405
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.09      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.09      SUBAREA RUNOFF(CFS) =    6.30
  EFFECTIVE AREA(ACRES) =    12.80   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    12.80       PEAK FLOW RATE(CFS) =      38.57

****************************************************************************
  FLOW PROCESS FROM NODE    606.00 TO NODE    607.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3038.95  DOWNSTREAM(FEET) =  3038.20
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.58
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     38.57
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   8.78
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    607.00 =  1346.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    607.00 TO NODE    607.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   8.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.328
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.09      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.09      SUBAREA RUNOFF(CFS) =    6.15
  EFFECTIVE AREA(ACRES) =    14.89   AREA-AVERAGED Fm(INCH/HR) =  0.06
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    14.89       PEAK FLOW RATE(CFS) =      43.83

****************************************************************************
  FLOW PROCESS FROM NODE    607.00 TO NODE    608.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3038.20  DOWNSTREAM(FEET) =  3037.44
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.99
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     43.83
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   9.09
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    608.00 =  1496.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    608.00 TO NODE    608.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.258
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.68      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.68      SUBAREA RUNOFF(CFS) =    4.84
  EFFECTIVE AREA(ACRES) =    16.57   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    16.57       PEAK FLOW RATE(CFS) =      47.75

****************************************************************************
  FLOW PROCESS FROM NODE    608.00 TO NODE    609.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3037.44  DOWNSTREAM(FEET) =  3036.69
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.02
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     47.75
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   9.40
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    609.00 =  1646.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    609.00 TO NODE    609.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =   9.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.193
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.10      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    5.93
  EFFECTIVE AREA(ACRES) =    18.67   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    18.67       PEAK FLOW RATE(CFS) =      52.70

****************************************************************************
  FLOW PROCESS FROM NODE    609.00 TO NODE    610.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3036.69  DOWNSTREAM(FEET) =  3035.93
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.40
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     52.70
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   9.70
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    610.00 =  1796.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    610.00 TO NODE    610.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN) =   9.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.134
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.10      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    5.82
  EFFECTIVE AREA(ACRES) =    20.77   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    20.77       PEAK FLOW RATE(CFS) =      57.52

****************************************************************************
  FLOW PROCESS FROM NODE    610.00 TO NODE    611.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3035.93  DOWNSTREAM(FEET) =  3035.19
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.39
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     57.52
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =  10.00
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    611.00 =  1946.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    611.00 TO NODE    611.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN) =  10.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.078
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        3.02      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    3.02      SUBAREA RUNOFF(CFS) =    8.21
  EFFECTIVE AREA(ACRES) =    23.79   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    23.79       PEAK FLOW RATE(CFS) =      64.68

****************************************************************************
  FLOW PROCESS FROM NODE    611.00 TO NODE    612.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3035.18  DOWNSTREAM(FEET) =  3034.72
  FLOW LENGTH(FEET) =    93.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.74
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =     64.68
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =  10.17
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    612.00 =  2039.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    612.00 TO NODE    612.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.045
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        0.63      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    0.63      SUBAREA RUNOFF(CFS) =    1.69
  EFFECTIVE AREA(ACRES) =    24.42   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    24.42       PEAK FLOW RATE(CFS) =      65.68

****************************************************************************
  FLOW PROCESS FROM NODE    612.00 TO NODE    613.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3034.72  DOWNSTREAM(FEET) =  3033.30
  FLOW LENGTH(FEET) =   282.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.83
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     65.68
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =  10.70
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    613.00 =  2321.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    613.00 TO NODE    613.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.953
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        1.23      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    1.23      SUBAREA RUNOFF(CFS) =    3.21
  EFFECTIVE AREA(ACRES) =    25.65   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    25.65       PEAK FLOW RATE(CFS) =      66.87

****************************************************************************
  FLOW PROCESS FROM NODE    613.00 TO NODE    613.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     66.87  10.70    2.953  0.57( 0.06) 0.10    25.6     600.00
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    613.00 =  2321.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1     82.16  12.36    2.709  0.57( 0.06) 0.10    34.4     503.00
      2     79.33  13.62    2.556  0.57( 0.06) 0.10    35.3     500.00
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE    613.00 =     0.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    144.56  10.70    2.953  0.57( 0.06) 0.10    55.4     600.00
      2    143.38  12.36    2.709  0.57( 0.06) 0.10    60.1     503.00
      3    137.03  13.62    2.556  0.57( 0.06) 0.10    60.9     500.00
    TOTAL AREA(ACRES) =     60.92

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      144.56  Tc(MIN.) =   10.705
  EFFECTIVE AREA(ACRES) =     55.45  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =     60.92
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    613.00 =  2321.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    613.00 TO NODE    613.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    613.00 TO NODE    613.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN) =  10.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.953
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        5.10      0.57      0.10    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA AREA(ACRES) =    5.10      SUBAREA RUNOFF(CFS) =   13.30
  EFFECTIVE AREA(ACRES) =    60.55   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =    66.02       PEAK FLOW RATE(CFS) =     157.86
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     66.02  TC(MIN.) =     10.70
  EFFECTIVE AREA(ACRES) =     60.55  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =    157.86

  ** PEAK FLOW RATE TABLE **
   STREAM     Q     Tc   Intensity   Fp(Fm)     Ap   Ae     HEADWATER
   NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)    NODE
      1    157.86  10.70    2.953  0.57( 0.06) 0.10    60.5     600.00
      2    155.56  12.36    2.709  0.57( 0.06) 0.10    65.2     503.00
      3    148.50  13.62    2.556  0.57( 0.06) 0.10    66.0     500.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 700-701)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P700.DAT
  TIME/DATE OF STUDY: 08:38 08/14/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   276.00
  ELEVATION DATA: UPSTREAM(FEET) =   2992.95  DOWNSTREAM(FEET) =   2985.13

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.872
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.235
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.32      0.57      0.10    69    5.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      1.20
  TOTAL AREA(ACRES) =      0.32   PEAK FLOW RATE(CFS) =      1.20
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      0.32  TC(MIN.) =      5.87
  EFFECTIVE AREA(ACRES) =      0.32  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =      1.20
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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                           THIENES ENGINEERING
                         16800 VALLEY VIEW AVENUE
                            LA MIRADA CA 90638
                   PH: (714) 521-4811 FAX: (714) 521-4173

 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 800-801)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P800.DAT
  TIME/DATE OF STUDY: 08:41 08/14/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   468.00
  ELEVATION DATA: UPSTREAM(FEET) =   3010.80  DOWNSTREAM(FEET) =   2990.62

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.669
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.923
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.52      0.57      0.10    69    6.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      1.81
  TOTAL AREA(ACRES) =      0.52   PEAK FLOW RATE(CFS) =      1.81
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      0.52  TC(MIN.) =      6.67
  EFFECTIVE AREA(ACRES) =      0.52  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =      1.81
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             Ver. 8.0  Release Date: 01/01/99  License ID 1435

                          Analysis prepared by:

                           THIENES ENGINEERING
                         16800 VALLEY VIEW AVENUE
                            LA MIRADA CA 90638
                    PH: (714) 521-4811 FAX: (714) 521-4173

 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 900-901)                                       *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\P900.DAT
  TIME/DATE OF STUDY: 16:15 08/13/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   207.00
  ELEVATION DATA: UPSTREAM(FEET) =   3017.67  DOWNSTREAM(FEET) =   3007.94

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.663
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.20      0.57      0.10    69    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.10
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.20   PEAK FLOW RATE(CFS) =      0.83
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      0.20  TC(MIN.) =      5.00
  EFFECTIVE AREA(ACRES) =      0.20  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  PEAK FLOW RATE(CFS)   =      0.83
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
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                           Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                         *
* PROPOSED CONDITION (NODES 1000-1001)                                     *
* 100-YEAR STORM EVENT                                                     *
 ***************************************************************************

  FILE NAME: Z:\4099\P1000.DAT
  TIME/DATE OF STUDY: 17:15 09/03/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

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

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0500

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   173.00
  ELEVATION DATA: UPSTREAM(FEET) =   2984.00  DOWNSTREAM(FEET) =   2976.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.663
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.21      0.57     0.100    69    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =      0.21   PEAK FLOW RATE(CFS) =      0.87
============================================================================
```

```
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =        0.2  TC(MIN.) =      5.00
  EFFECTIVE AREA(ACRES) =      0.21  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       0.87
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

↑

APPENDIX C

HYDROGRAPH CALCULATIONS

EXISTING CONDITION

```
******************************************************************************
           NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
                     AND LOW LOSS FRACTION ESTIMATIONS
==============================================================================
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                           Analysis prepared by:



******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  TEI JOB NO. 4099
  EXISTING CONDITION 100-YR
  LOSS RATES
==============================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
    AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

    TOTAL 24-HOUR DURATION RAINFALL DEPTH =     3.29 (inches)

    SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
       TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
         1        224.90      100.00            91.       0.180       0.712

    TOTAL AREA (Acres) =    224.90

    AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.180

    AREA-AVERAGED LOW LOSS FRACTION, Y = 0.288
==============================================================================
```

```
*****************************************************************************
                        SMALL AREA UNIT HYDROGRAPH MODEL
=============================================================================
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                           Analysis prepared by:



*****************************************************************************
-----------------------------------------------------------------------------

 Problem Descriptions:
  TEI JOB NO. 4099
  EXISTING CONDITION 100-YR
  HYDROGRAPH
-----------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =  224.90
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.288
    TIME OF CONCENTRATION(MIN.) = 30.25
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.84
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.05
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  1.50
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.94
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  3.29

-----------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    41.81
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    19.85

*****************************************************************************
  TIME     VOLUME       Q    0.       77.5     155.0     232.5     310.0
 (HOURS)    (AF)      (CFS)
-----------------------------------------------------------------------------
  0.37      0.1158      7.56  Q         .         .         .         .
  0.88      0.4324      7.64  Q         .         .         .         .
  1.38      0.7550      7.85  .Q        .         .         .         .
  1.88      1.0843      7.96  .Q        .         .         .         .
  2.39      1.4208      8.19  .Q        .         .         .         .
  2.89      1.7649      8.32  .Q        .         .         .         .
  3.40      2.1170      8.58  .Q        .         .         .         .
  3.90      2.4777      8.73  .Q        .         .         .         .
  4.40      2.8475      9.03  .Q        .         .         .         .
  4.91      3.2270      9.19  .Q        .         .         .         .
  5.41      3.6170      9.53  .Q        .         .         .         .
  5.92      4.0181      9.72  .Q        .         .         .         .
  6.42      4.4315     10.12  .Q        .         .         .         .
  6.93      4.8578     10.34  .Q        .         .         .         .
  7.43      5.2986     10.82  .Q        .         .         .         .
  7.93      5.7548     11.08  .Q        .         .         .         .
  8.44      6.2283     11.65  .Q        .         .         .         .
```

```
  8.94      6.7205     11.97  .Q        .         .         .         .
  9.45      7.2341     12.68  .Q        .         .         .         .
  9.95      7.7708     13.08  .Q        .         .         .         .
 10.45      8.3347     13.99  .Q        .         .         .         .
 10.96      8.9283     14.51  .Q        .         .         .         .
 11.46      9.5578     15.71  . Q       .         .         .         .
 11.97     10.2274     16.43  . Q       .         .         .         .
 12.47     10.9388     17.72  . Q       .         .         .         .
 12.98     11.6979     18.72  . Q       .         .         .         .
 13.48     12.5332     21.38  . Q       .         .         .         .
 13.98     13.4606     23.14  . Q       .         .         .         .
 14.49     14.4609     24.88  .  Q      .         .         .         .
 14.99     15.5691     28.32  .  Q      .         .         .         .
 15.50     17.0412     42.34  .    Q    .         .         .         .
 16.00     19.1774     60.20  .      Q  .         .         .         .
 16.50     26.7171    301.71  .         .         .         .       Q .
 17.01     33.7028     33.61  .   Q     .         .         .         .
 17.51     34.9305     25.32  .  Q      .         .         .         .
 18.02     35.8733     19.93  . Q       .         .         .         .
 18.52     36.6475     17.23  . Q       .         .         .         .
 19.02     37.3205     15.08  .Q        .         .         .         .
 19.53     37.9162     13.51  .Q        .         .         .         .
 20.03     38.4542     12.31  .Q        .         .         .         .
 20.54     38.9473     11.36  .Q        .         .         .         .
 21.04     39.4041     10.57  .Q        .         .         .         .
 21.55     39.8310      9.92  .Q        .         .         .         .
 22.05     40.2325      9.36  .Q        .         .         .         .
 22.55     40.6122      8.87  .Q        .         .         .         .
 23.06     40.9731      8.45  .Q        .         .         .         .
 23.56     41.3174      8.07  .Q        .         .         .         .
 24.07     41.6469      7.74  Q         .         .         .         .
 24.57     41.8081      0.00  Q         .         .         .         .
 ------------------------------------------------------------------------
-----------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1452.0
10%	121.0
20%	30.2
30%	30.2
40%	30.2
50%	30.2
60%	30.2
70%	30.2
80%	30.2
90%	30.2

PROPOSED CONDITION

```
******************************************************************************
           NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
                     AND LOW LOSS FRACTION ESTIMATIONS
==============================================================================
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                           Analysis prepared by:



******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CONDITION 100-YR
  LOSS RATES
==============================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
    AND LOW LOSS FRACTION ESTIMATIONS FOR AMC II:

    TOTAL 24-HOUR DURATION RAINFALL DEPTH =     3.29 (inches)

    SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
       TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
         1        224.90       10.00            69.       0.566       0.862

    TOTAL AREA (Acres) =    224.90

    AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.057

    AREA-AVERAGED LOW LOSS FRACTION, Y = 0.138
==============================================================================
```

```
******************************************************************************
                        SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                           Analysis prepared by:



******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CONDITION 100-YR
  HYDROGRAPH
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =  224.90
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.057
    LOW LOSS FRACTION = 0.138
    TIME OF CONCENTRATION(MIN.) = 16.62
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.84
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.05
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  1.50
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.94
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  3.29

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    48.98
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    12.68

******************************************************************************
  TIME     VOLUME       Q    0.      115.0     230.0     345.0     460.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.21      0.0796      9.13  Q         .         .         .         .
  0.49      0.2894      9.19  Q         .         .         .         .
  0.76      0.5013      9.32  Q         .         .         .         .
  1.04      0.7155      9.39  Q         .         .         .         .
  1.32      0.9322      9.54  Q         .         .         .         .
  1.60      1.1514      9.61  Q         .         .         .         .
  1.87      1.3732      9.76  Q         .         .         .         .
  2.15      1.5976      9.84  Q         .         .         .         .
  2.43      1.8248     10.01  Q         .         .         .         .
  2.70      2.0548     10.09  Q         .         .         .         .
  2.98      2.2878     10.26  Q         .         .         .         .
  3.26      2.5238     10.35  Q         .         .         .         .
  3.53      2.7630     10.54  Q         .         .         .         .
  3.81      3.0053     10.64  Q         .         .         .         .
  4.09      3.2511     10.84  Q         .         .         .         .
  4.37      3.5004     10.94  Q         .         .         .         .
  4.64      3.7533     11.16  Q         .         .         .         .
```

4.92	4.0099	11.27	Q
5.20	4.2705	11.50	.Q
5.47	4.5352	11.62	.Q
5.75	4.8041	11.87	.Q
6.03	5.0775	12.01	.Q
6.30	5.3555	12.28	.Q
6.58	5.6383	12.43	.Q
6.86	5.9262	12.73	.Q
7.14	6.2194	12.89	.Q
7.41	6.5183	13.22	.Q
7.69	6.8229	13.40	.Q
7.97	7.1338	13.77	.Q
8.24	7.4512	13.96	.Q
8.52	7.7755	14.37	.Q
8.80	8.1071	14.59	.Q
9.07	8.4464	15.06	.Q
9.35	8.7939	15.30	.Q
9.63	9.1503	15.83	.Q
9.91	9.5160	16.11	.Q
10.18	9.8919	16.72	.Q
10.46	10.2784	17.05	.Q
10.74	10.6768	17.75	.Q
11.01	11.0876	18.14	.Q
11.29	11.5124	18.97	.Q
11.57	11.9520	19.43	.Q
11.85	12.4083	20.44	.Q
12.12	12.8826	21.00	.Q
12.40	13.3710	21.68	.Q
12.68	13.8752	22.37	.Q
12.95	14.4053	23.94	. Q
13.23	14.9637	24.85	. Q
13.51	15.5566	26.95	. Q
13.78	16.1878	28.19	. Q
14.06	16.8674	31.19	. Q
14.34	17.5634	29.62	. Q
14.62	18.2845	33.38	. Q
14.89	19.0825	36.33	. Q
15.17	20.0114	44.83	. Q
15.45	21.1126	51.37	. Q
15.72	22.5811	76.92	. Q
16.00	25.2969	160.34	. Q
16.28	32.2944	450.99	. Q
16.55	38.1509	60.66	. Q
16.83	39.3033	40.03	. Q
17.11	40.1159	30.96	. Q
17.39	40.8090	29.59	. Q
17.66	41.4435	25.84	. Q
17.94	42.0039	23.12	. Q
18.22	42.5115	21.22	.Q
18.49	42.9825	19.92	.Q
18.77	43.4227	18.54	.Q
19.05	43.8341	17.39	.Q
19.32	44.2210	16.41	.Q
19.60	44.5869	15.56	.Q
19.88	44.9347	14.82	.Q
20.16	45.2664	14.16	.Q
20.43	45.5840	13.58	.Q
20.71	45.8888	13.05	.Q
20.99	46.1821	12.58	.Q
21.26	46.4650	12.14	.Q
21.54	46.7385	11.75	.Q
21.82	47.0032	11.38	Q
22.09	47.2599	11.05	Q
22.37	47.5092	10.74	Q
22.65	47.7517	10.45	Q

22.92	47.9877	10.18	Q	.	.	.	.
23.20	48.2178	9.92	Q	.	.	.	.
23.48	48.4422	9.69	Q	.	.	.	.
23.76	48.6615	9.46	Q	.	.	.	.
24.03	48.8757	9.26	Q	.	.	.	.
24.31	48.9817	0.00	Q	.	.	.	.

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

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1445.9
10%	83.1
20%	33.2
30%	33.2
40%	16.6
50%	16.6
60%	16.6
70%	16.6
80%	16.6
90%	16.6

JOB #4099
BASIN #1 DETENTION VOLUME

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Discharge (cfs)
3001.44	0.00	51,083				
			29,574	29,574	0.68	0.0
3002.00	0.56	54,539				
			28,082	57,656	1.32	0.0
3002.50	1.06	57,790				
			29,714	87,371	2.01	0.0
3003.00	1.56	61,067				
			31,363	118,733	2.73	0.0
3003.50	2.06	64,383				
			33,029	151,762	3.48	0.0
3004.00	2.56	67,734				
			34,713	186,475	4.28	0.0
3004.50	3.06	71,117				
			36,413	222,888	5.12	0.0
3005.00	3.56	74,536				
			38,132	261,020	5.99	0.0
3005.50	4.06	77,990				
			10,984	272,004	6.24	0.0
10-YR HCOC → 3005.64	4.20	78,919				
			28,872	300,875	6.91	32.3
3006.00	4.56	81,479				
			41,621	342,496	7.86	34.0
3006.50	5.06	85,003				
			43,391	385,887	8.86	35.7
3007.00	5.56	88,561				
DET. 3007.21			45,180	431,066	9.90	37.2
3007.50	6.06	92,158				
			46,987	478,054	10.97	38.7
3008.00	6.56	95,791				
			48,812	526,866	12.10	40.2
3008.50	7.06	99,457				
			50,653	577,519	13.26	41.6
3009.00	7.56	103,155				

V=9.29 ac ft
D=5.77'
100^{YR} Q= 36.3 cfs

24" RISER

Calculations - Orifice Equation for 24" riser with an a calculated opening of 3.14 ft^2

$$Q = C \times A \times \sqrt{64.4 \times H}$$

$$Q = 0.6 \times 3.14 \sqrt{64.4 \times 5.77}$$

$$Q = 36.3 \text{ cfs}$$

A = Area Opening (3.14)
H = Height at 3007.21 (5.77 ft.)

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****************************************************************************

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                          Analysis prepared by:

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 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB NO. 4099                                                      *
* DETENTION BASIN #1                                                    *
* HYDROGRAPH                                                            *
 ************************************************************************

  FILE NAME: C:\XDRIVE\4099\DETB1.DAT
  TIME/DATE OF STUDY: 07:46 08/30/2024


****************************************************************************
  FLOW PROCESS FROM NODE   500.00 TO NODE   501.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      66.020 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.140 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.
         DESERT(UNDEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.057
         LOW LOSS FRACTION = 0.138
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.35
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.84
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.05
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.50
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  1.94
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  3.29

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.997
          30-MINUTE FACTOR = 0.997
           1-HOUR FACTOR = 0.997
           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 =  59.524


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 5.496                 43.883
        2                40.999                283.463
```

3	67.773	213.775
4	79.221	91.405
5	85.931	53.575
6	90.304	34.911
7	93.290	23.841
8	95.433	17.108
9	96.969	12.268
10	97.941	7.760
11	98.600	5.264
12	99.301	5.590
13	99.720	3.351
14	99.930	1.675
15	100.000	0.558

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.0082
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 16.0816

↑

==========

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. 50.0 100.0 150.0 200.0
0.083	0.0011	0.16	Q . . . .
0.167	0.0096	1.23	Q . . . .
0.250	0.0236	2.04	Q . . . .
0.333	0.0401	2.39	Q . . . .
0.417	0.0579	2.59	Q . . . .
0.500	0.0768	2.73	Q . . . .
0.583	0.0963	2.83	Q . . . .
0.667	0.1163	2.91	Q . . . .
0.750	0.1367	2.96	Q . . . .
0.833	0.1574	3.00	Q . . . .
0.917	0.1782	3.03	Q . . . .
1.000	0.1993	3.06	Q . . . .
1.083	0.2206	3.08	Q . . . .
1.167	0.2419	3.10	Q . . . .
1.250	0.2634	3.11	Q . . . .
1.333	0.2849	3.13	Q . . . .
1.417	0.3065	3.14	Q . . . .
1.500	0.3282	3.15	Q . . . .
1.583	0.3499	3.16	Q . . . .
1.667	0.3717	3.17	Q . . . .
1.750	0.3937	3.18	Q . . . .
1.833	0.4156	3.19	QV . . . .
1.917	0.4377	3.20	QV . . . .
2.000	0.4598	3.22	QV . . . .
2.083	0.4821	3.23	QV . . . .
2.167	0.5044	3.24	QV . . . .
2.250	0.5267	3.25	QV . . . .
2.333	0.5492	3.26	QV . . . .
2.417	0.5718	3.27	QV . . . .
2.500	0.5944	3.29	QV . . . .
2.583	0.6171	3.30	QV . . . .
2.667	0.6399	3.31	QV . . . .
2.750	0.6628	3.32	QV . . . .
2.833	0.6858	3.34	QV . . . .
2.917	0.7089	3.35	QV . . . .
3.000	0.7320	3.36	QV . . . .
3.083	0.7553	3.38	QV . . . .
3.167	0.7786	3.39	QV . . . .
3.250	0.8021	3.40	QV . . . .
3.333	0.8256	3.42	Q V . . . .
3.417	0.8492	3.43	Q V . . . .
3.500	0.8729	3.44	Q V . . . .

3.583	0.8967	3.46	Q V	.	.	.	.
3.667	0.9206	3.47	Q V	.	.	.	.
3.750	0.9447	3.49	Q V	.	.	.	.
3.833	0.9688	3.50	Q V	.	.	.	.
3.917	0.9930	3.51	Q V	.	.	.	.
4.000	1.0173	3.53	Q V	.	.	.	.
4.083	1.0417	3.54	Q V	.	.	.	.
4.167	1.0662	3.56	Q V	.	.	.	.
4.250	1.0908	3.57	Q V	.	.	.	.
4.333	1.1156	3.59	Q V	.	.	.	.
4.417	1.1404	3.61	Q V	.	.	.	.
4.500	1.1653	3.62	Q V	.	.	.	.
4.583	1.1904	3.64	Q V	.	.	.	.
4.667	1.2156	3.65	Q V	.	.	.	.
4.750	1.2408	3.67	Q V	.	.	.	.
4.833	1.2662	3.69	Q V	.	.	.	.
4.917	1.2917	3.70	Q V	.	.	.	.
5.000	1.3174	3.72	Q V	.	.	.	.
5.083	1.3431	3.74	Q V	.	.	.	.
5.167	1.3690	3.76	Q V	.	.	.	.
5.250	1.3949	3.77	Q V	.	.	.	.
5.333	1.4210	3.79	Q V	.	.	.	.
5.417	1.4473	3.81	Q V	.	.	.	.
5.500	1.4736	3.83	Q V	.	.	.	.
5.583	1.5001	3.84	Q V	.	.	.	.
5.667	1.5267	3.86	Q V	.	.	.	.
5.750	1.5534	3.88	Q V	.	.	.	.
5.833	1.5803	3.90	Q V	.	.	.	.
5.917	1.6073	3.92	Q V	.	.	.	.
6.000	1.6345	3.94	Q V	.	.	.	.
6.083	1.6617	3.96	Q V	.	.	.	.
6.167	1.6892	3.98	Q V	.	.	.	.
6.250	1.7167	4.00	Q V	.	.	.	.
6.333	1.7444	4.02	Q V	.	.	.	.
6.417	1.7723	4.04	Q V	.	.	.	.
6.500	1.8002	4.06	Q V	.	.	.	.
6.583	1.8284	4.09	Q V	.	.	.	.
6.667	1.8567	4.11	Q V	.	.	.	.
6.750	1.8851	4.13	Q V	.	.	.	.
6.833	1.9137	4.15	Q V	.	.	.	.
6.917	1.9425	4.17	Q V	.	.	.	.
7.000	1.9714	4.20	Q V	.	.	.	.
7.083	2.0005	4.22	Q V	.	.	.	.
7.167	2.0297	4.25	Q V	.	.	.	.
7.250	2.0591	4.27	Q V	.	.	.	.
7.333	2.0887	4.30	Q V	.	.	.	.
7.417	2.1184	4.32	Q V	.	.	.	.
7.500	2.1484	4.35	Q V	.	.	.	.
7.583	2.1785	4.37	Q V	.	.	.	.
7.667	2.2088	4.40	Q V	.	.	.	.
7.750	2.2392	4.42	Q V	.	.	.	.
7.833	2.2699	4.45	Q V	.	.	.	.
7.917	2.3007	4.48	Q V	.	.	.	.
8.000	2.3317	4.51	Q V	.	.	.	.
8.083	2.3630	4.53	Q V	.	.	.	.
8.167	2.3944	4.56	Q V	.	.	.	.
8.250	2.4260	4.59	Q V	.	.	.	.
8.333	2.4578	4.62	Q V	.	.	.	.
8.417	2.4899	4.65	Q V	.	.	.	.
8.500	2.5221	4.68	Q V	.	.	.	.
8.583	2.5546	4.71	Q V	.	.	.	.
8.667	2.5873	4.75	Q V	.	.	.	.
8.750	2.6202	4.78	Q V	.	.	.	.
8.833	2.6534	4.81	Q V	.	.	.	.
8.917	2.6867	4.84	Q V	.	.	.	.
9.000	2.7203	4.88	Q V	.	.	.	.
9.083	2.7542	4.91	Q V	.	.	.	.
9.167	2.7883	4.95	Q V	.	.	.	.
9.250	2.8226	4.99	Q V	.	.	.	.
9.333	2.8572	5.02	.Q V	.	.	.	.
9.417	2.8921	5.06	.Q V	.	.	.	.
9.500	2.9272	5.10	.Q V	.	.	.	.
9.583	2.9626	5.14	.Q V	.	.	.	.

9.667	2.9983	5.18	.Q V . . . .
9.750	3.0342	5.22	.Q V . . . .
9.833	3.0705	5.26	.Q V . . . .
9.917	3.1070	5.30	.Q V . . . .
10.000	3.1438	5.35	.Q V . . . .
10.083	3.1810	5.39	.Q V . . . .
10.167	3.2184	5.44	.Q V . . . .
10.250	3.2562	5.48	.Q V . . . .
10.333	3.2943	5.53	.Q V . . . .
10.417	3.3327	5.58	.Q V . . . .
10.500	3.3715	5.63	.Q V . . . .
10.583	3.4106	5.68	.Q V . . . .
10.667	3.4501	5.73	.Q V . . . .
10.750	3.4900	5.79	.Q V . . . .
10.833	3.5302	5.84	.Q V . . . .
10.917	3.5708	5.90	.Q V . . . .
11.000	3.6118	5.96	.Q V . . . .
11.083	3.6532	6.01	.Q V. . . .
11.167	3.6951	6.08	.Q V. . . .
11.250	3.7374	6.14	.Q V. . . .
11.333	3.7801	6.20	.Q V. . . .
11.417	3.8232	6.27	.Q V. . . .
11.500	3.8669	6.34	.Q V. . . .
11.583	3.9110	6.40	.Q V. . . .
11.667	3.9556	6.48	.Q V. . . .
11.750	4.0007	6.55	.Q V. . . .
11.833	4.0463	6.63	.Q V . . . .
11.917	4.0925	6.70	.Q V . . . .
12.000	4.1392	6.79	.Q V . . . .
12.083	4.1864	6.86	.Q V . . . .
12.167	4.2338	6.88	.Q V . . . .
12.250	4.2815	6.92	.Q V . . . .
12.333	4.3296	6.99	.Q V . . . .
12.417	4.3783	7.07	.Q V . . . .
12.500	4.4277	7.17	.Q .V . . . .
12.583	4.4777	7.26	.Q .V . . . .
12.667	4.5284	7.36	.Q .V . . . .
12.750	4.5798	7.47	.Q .V . . . .
12.833	4.6320	7.58	.Q .V . . . .
12.917	4.6850	7.69	.Q .V . . . .
13.000	4.7389	7.82	.Q .V . . . .
13.083	4.7936	7.94	.Q .V . . . .
13.167	4.8493	8.08	.Q . V . . . .
13.250	4.9058	8.22	.Q . V . . . .
13.333	4.9635	8.37	.Q . V . . . .
13.417	5.0221	8.52	.Q . V . . . .
13.500	5.0819	8.68	.Q . V . . . .
13.583	5.1428	8.85	.Q . V . . . .
13.667	5.2050	9.03	.Q . V . . . .
13.750	5.2685	9.21	.Q . V . . . .
13.833	5.3333	9.42	.Q . V . . . .
13.917	5.3995	9.62	.Q . V . . . .
14.000	5.4674	9.85	.Q . V . . . .
14.083	5.5362	10.00	. Q . V . . . .
14.167	5.6038	9.81	.Q . V . . . .
14.250	5.6707	9.72	.Q . V . . . .
14.333	5.7386	9.86	.Q . V . . . .
14.417	5.8079	10.05	. Q . V . . . .
14.500	5.8790	10.33	. Q . V . . . .
14.583	5.9521	10.62	. Q . V . . . .
14.667	6.0277	10.98	. Q . V . . . .
14.750	6.1059	11.35	. Q . V . . . .
14.833	6.1871	11.80	. Q . V . . . .
14.917	6.2716	12.26	. Q . V . . . .
15.000	6.3599	12.82	. Q . V . . . .
15.083	6.4522	13.40	. Q . V . . . .
15.167	6.5495	14.12	. Q . V . . . .
15.250	6.6519	14.88	. Q . V . . . .
15.333	6.7610	15.83	. Q . V . . . .
15.417	6.8769	16.83	. Q . V . . . .
15.500	7.0013	18.06	. Q . V . . . .
15.583	7.1354	19.47	. Q . V . . . .
15.667	7.2837	21.53	. Q . V . . . .

15.750	7.4569	25.16	. Q . V . . .
15.833	7.7055	36.09	. Q . V. . .
15.917	8.0306	47.20	. Q. V. . .
16.000	8.4556	61.72	. . Q .V . .
16.083	9.0694	89.12	. . Q . V . .
16.167	10.0906	148.28	. . . V Q. .
16.250	10.9381	123.07	. . . Q V . .
16.333	11.4650	76.50	. . Q . V . .
16.417	11.8329	53.41	. Q . V. .
16.500	12.1133	40.72	. Q . . V .
16.583	12.3368	32.46	. Q . . V .
16.667	12.5209	26.72	. Q . . .V .
16.750	12.6749	22.36	. Q . . .V .
16.833	12.8044	18.81	. Q . . .V .
16.917	12.9167	16.30	. Q . . . V .
17.000	13.0185	14.78	. Q . . . V .
17.083	13.1079	12.98	. Q . . . V .
17.167	13.1896	11.87	. Q . . . V .
17.250	13.2655	11.02	. Q . . . V .
17.333	13.3365	10.32	. Q . . . V .
17.417	13.4043	9.83	.Q . . . V .
17.500	13.4691	9.42	.Q . . . V .
17.583	13.5314	9.05	.Q . . . V .
17.667	13.5914	8.71	.Q . . . V .
17.750	13.6492	8.40	.Q . . . V .
17.833	13.7051	8.11	.Q . . . V .
17.917	13.7592	7.85	.Q . . . V .
18.000	13.8116	7.61	.Q . . . V .
18.083	13.8625	7.40	.Q . . . V .
18.167	13.9125	7.25	.Q . . . V .
18.250	13.9614	7.10	.Q . . . V .
18.333	14.0092	6.94	.Q . . . V .
18.417	14.0559	6.78	.Q . . . V .
18.500	14.1016	6.63	.Q . . . V .
18.583	14.1462	6.48	.Q . . . V .
18.667	14.1899	6.34	.Q . . . V .
18.750	14.2327	6.21	.Q . . . V .
18.833	14.2746	6.08	.Q . . . V .
18.917	14.3156	5.96	.Q . . . V .
19.000	14.3559	5.85	.Q . . . V .
19.083	14.3955	5.74	.Q . . . V .
19.167	14.4343	5.64	.Q . . . V .
19.250	14.4725	5.54	.Q . . . V .
19.333	14.5100	5.45	.Q . . . V .
19.417	14.5469	5.36	.Q . . . V .
19.500	14.5832	5.27	.Q . . . V .
19.583	14.6189	5.19	.Q . . . V .
19.667	14.6540	5.11	.Q . . . V .
19.750	14.6887	5.03	.Q . . . V .
19.833	14.7228	4.96	Q . . . V .
19.917	14.7564	4.88	Q . . . V .
20.000	14.7896	4.82	Q . . . V .
20.083	14.8223	4.75	Q . . . V .
20.167	14.8546	4.69	Q . . . V .
20.250	14.8865	4.63	Q . . . V .
20.333	14.9179	4.57	Q . . . V .
20.417	14.9490	4.51	Q . . . V .
20.500	14.9796	4.45	Q . . . V .
20.583	15.0099	4.40	Q . . . V .
20.667	15.0399	4.35	Q . . . V .
20.750	15.0695	4.30	Q . . . V .
20.833	15.0987	4.25	Q . . . V .
20.917	15.1277	4.20	Q . . . V .
21.000	15.1563	4.15	Q . . . V .
21.083	15.1846	4.11	Q . . . V .
21.167	15.2126	4.07	Q . . . V .
21.250	15.2403	4.02	Q . . . V .
21.333	15.2677	3.98	Q . . . V .
21.417	15.2949	3.94	Q . . . V .
21.500	15.3217	3.90	Q . . . V .
21.583	15.3484	3.86	Q . . . V .
21.667	15.3747	3.83	Q . . . V .
21.750	15.4008	3.79	Q . . . V .

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  21.833     15.4267      3.76  Q         .         .         .       V .
  21.917     15.4523      3.72  Q         .         .         .       V .
  22.000     15.4777      3.69  Q         .         .         .       V .
  22.083     15.5029      3.65  Q         .         .         .       V .
  22.167     15.5278      3.62  Q         .         .         .       V .
  22.250     15.5526      3.59  Q         .         .         .       V .
  22.333     15.5771      3.56  Q         .         .         .       V .
  22.417     15.6014      3.53  Q         .         .         .       V .
  22.500     15.6255      3.50  Q         .         .         .       V .
  22.583     15.6494      3.47  Q         .         .         .       V .
  22.667     15.6732      3.44  Q         .         .         .       V .
  22.750     15.6967      3.42  Q         .         .         .        V.
  22.833     15.7200      3.39  Q         .         .         .        V.
  22.917     15.7432      3.36  Q         .         .         .        V.
  23.000     15.7662      3.34  Q         .         .         .        V.
  23.083     15.7890      3.31  Q         .         .         .        V.
  23.167     15.8116      3.29  Q         .         .         .        V.
  23.250     15.8341      3.26  Q         .         .         .        V.
  23.333     15.8564      3.24  Q         .         .         .        V.
  23.417     15.8786      3.22  Q         .         .         .        V.
  23.500     15.9006      3.19  Q         .         .         .        V.
  23.583     15.9224      3.17  Q         .         .         .        V.
  23.667     15.9441      3.15  Q         .         .         .        V.
  23.750     15.9656      3.13  Q         .         .         .        V.
  23.833     15.9870      3.10  Q         .         .         .        V.
  23.917     16.0082      3.08  Q         .         .         .        V.
  24.000     16.0293      3.06  Q         .         .         .        V.
  24.083     16.0491      2.88  Q         .         .         .        V.
  24.167     16.0615      1.80  Q         .         .         .        V.
  24.250     16.0683      0.98  Q         .         .         .        V.
  24.333     16.0726      0.63  Q         .         .         .        V.
  24.417     16.0756      0.43  Q         .         .         .        V.
  24.500     16.0776      0.30  Q         .         .         .        V.
  24.583     16.0790      0.20  Q         .         .         .        V.
  24.667     16.0800      0.14  Q         .         .         .        V.
  24.750     16.0806      0.09  Q         .         .         .        V.
  24.833     16.0811      0.06  Q         .         .         .        V.
  24.917     16.0814      0.04  Q         .         .         .        V.
  25.000     16.0815      0.02  Q         .         .         .        V.
  25.083     16.0816      0.01  Q         .         .         .        V.

****************************************************************************
  FLOW PROCESS FROM NODE   501.00 TO NODE   502.00 IS CODE = 3.1
----------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
============================================================================

                    INFLOW
                  (STREAM 1)
                       |
                       |
                       V                __effective depth
                 -----------            |   (and volume)
                |           |    |     |
                |           |    |....V........
                | detention |<-->|           outflow
                |   basin   |    |.........._______
                 -----------     |     ^    |  \
                       |         |  dead    |   basin outlet
                       V         | storage |
                    OUTFLOW       ---------
                  (STREAM 1)


         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	4.20	0.02	6.240
3	4.56	32.30	6.910
4	5.06	34.00	7.860
5	5.56	35.70	8.860
6	6.06	37.20	9.900
7	6.56	38.70	10.970
8	7.06	40.20	12.100
9	7.56	41.60	13.260

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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	0.16	0.00	0.00	0.0	0.001
0.167	0.000	1.23	0.00	0.01	0.0	0.010
0.250	0.000	2.04	0.00	0.02	0.0	0.024
0.333	0.000	2.39	0.00	0.03	0.0	0.040
0.417	0.000	2.59	0.00	0.04	0.0	0.058
0.500	0.000	2.73	0.00	0.05	0.0	0.077
0.583	0.000	2.83	0.00	0.06	0.0	0.096
0.667	0.000	2.91	0.00	0.08	0.0	0.116
0.750	0.000	2.96	0.00	0.09	0.0	0.137
0.833	0.000	3.00	0.00	0.11	0.0	0.157
0.917	0.000	3.03	0.00	0.12	0.0	0.178
1.000	0.000	3.06	0.00	0.13	0.0	0.199
1.083	0.000	3.08	0.00	0.15	0.0	0.221
1.167	0.000	3.10	0.00	0.16	0.0	0.242
1.250	0.000	3.11	0.00	0.18	0.0	0.263
1.333	0.000	3.13	0.00	0.19	0.0	0.285
1.417	0.000	3.14	0.00	0.21	0.0	0.306
1.500	0.000	3.15	0.00	0.22	0.0	0.328
1.583	0.000	3.16	0.00	0.24	0.0	0.350
1.667	0.000	3.17	0.00	0.25	0.0	0.372
1.750	0.000	3.18	0.00	0.26	0.0	0.394
1.833	0.000	3.19	0.00	0.28	0.0	0.416
1.917	0.000	3.20	0.00	0.29	0.0	0.438
2.000	0.000	3.22	0.00	0.31	0.0	0.460
2.083	0.000	3.23	0.00	0.32	0.0	0.482
2.167	0.000	3.24	0.00	0.34	0.0	0.504
2.250	0.000	3.25	0.00	0.35	0.0	0.527
2.333	0.000	3.26	0.00	0.37	0.0	0.549
2.417	0.000	3.27	0.00	0.38	0.0	0.572
2.500	0.000	3.29	0.00	0.40	0.0	0.594
2.583	0.000	3.30	0.00	0.42	0.0	0.617
2.667	0.000	3.31	0.00	0.43	0.0	0.640
2.750	0.000	3.32	0.00	0.45	0.0	0.663
2.833	0.000	3.34	0.00	0.46	0.0	0.686
2.917	0.000	3.35	0.00	0.48	0.0	0.709
3.000	0.000	3.36	0.00	0.49	0.0	0.732
3.083	0.000	3.38	0.00	0.51	0.0	0.755
3.167	0.000	3.39	0.00	0.52	0.0	0.778
3.250	0.000	3.40	0.00	0.54	0.0	0.802
3.333	0.000	3.42	0.00	0.56	0.0	0.825
3.417	0.000	3.43	0.00	0.57	0.0	0.849
3.500	0.000	3.44	0.00	0.59	0.0	0.873
3.583	0.000	3.46	0.00	0.60	0.0	0.896
3.667	0.000	3.47	0.00	0.62	0.0	0.920
3.750	0.000	3.49	0.00	0.64	0.0	0.944
3.833	0.000	3.50	0.00	0.65	0.0	0.968
3.917	0.000	3.51	0.00	0.67	0.0	0.992

4.000	0.000	3.53	0.00	0.68	0.0	1.017
4.083	0.000	3.54	0.00	0.70	0.0	1.041
4.167	0.000	3.56	0.00	0.72	0.0	1.066
4.250	0.000	3.57	0.00	0.73	0.0	1.090
4.333	0.000	3.59	0.00	0.75	0.0	1.115
4.417	0.000	3.61	0.00	0.77	0.0	1.140
4.500	0.000	3.62	0.00	0.78	0.0	1.165
4.583	0.000	3.64	0.00	0.80	0.0	1.190
4.667	0.000	3.65	0.00	0.82	0.0	1.215
4.750	0.000	3.67	0.00	0.83	0.0	1.240
4.833	0.000	3.69	0.00	0.85	0.0	1.265
4.917	0.000	3.70	0.00	0.87	0.0	1.291
5.000	0.000	3.72	0.00	0.89	0.0	1.317
5.083	0.000	3.74	0.00	0.90	0.0	1.342
5.167	0.000	3.76	0.00	0.92	0.0	1.368
5.250	0.000	3.77	0.00	0.94	0.0	1.394
5.333	0.000	3.79	0.00	0.96	0.0	1.420
5.417	0.000	3.81	0.00	0.97	0.0	1.446
5.500	0.000	3.83	0.00	0.99	0.0	1.473
5.583	0.000	3.84	0.00	1.01	0.0	1.499
5.667	0.000	3.86	0.00	1.03	0.0	1.526
5.750	0.000	3.88	0.00	1.04	0.0	1.552
5.833	0.000	3.90	0.00	1.06	0.0	1.579
5.917	0.000	3.92	0.00	1.08	0.0	1.606
6.000	0.000	3.94	0.00	1.10	0.0	1.633
6.083	0.000	3.96	0.00	1.12	0.0	1.661
6.167	0.000	3.98	0.00	1.14	0.0	1.688
6.250	0.000	4.00	0.00	1.15	0.0	1.715
6.333	0.000	4.02	0.00	1.17	0.0	1.743
6.417	0.000	4.04	0.00	1.19	0.0	1.771
6.500	0.000	4.06	0.00	1.21	0.0	1.799
6.583	0.000	4.09	0.00	1.23	0.0	1.827
6.667	0.000	4.11	0.00	1.25	0.0	1.855
6.750	0.000	4.13	0.00	1.27	0.0	1.884
6.833	0.000	4.15	0.00	1.29	0.0	1.912
6.917	0.000	4.17	0.00	1.31	0.0	1.941
7.000	0.000	4.20	0.00	1.33	0.0	1.970
7.083	0.000	4.22	0.00	1.35	0.0	1.999
7.167	0.000	4.25	0.00	1.36	0.0	2.028
7.250	0.000	4.27	0.00	1.38	0.0	2.057
7.333	0.000	4.30	0.00	1.40	0.0	2.087
7.417	0.000	4.32	0.00	1.42	0.0	2.117
7.500	0.000	4.35	0.00	1.44	0.0	2.146
7.583	0.000	4.37	0.00	1.46	0.0	2.176
7.667	0.000	4.40	0.00	1.49	0.0	2.207
7.750	0.000	4.42	0.00	1.51	0.0	2.237
7.833	0.000	4.45	0.00	1.53	0.0	2.268
7.917	0.000	4.48	0.00	1.55	0.0	2.299
8.000	0.000	4.51	0.00	1.57	0.0	2.329
8.083	0.000	4.53	0.00	1.59	0.0	2.361
8.167	0.000	4.56	0.00	1.61	0.0	2.392
8.250	0.000	4.59	0.00	1.63	0.0	2.424
8.333	0.000	4.62	0.00	1.65	0.0	2.455
8.417	0.000	4.65	0.00	1.67	0.0	2.487
8.500	0.000	4.68	0.00	1.70	0.0	2.520
8.583	0.000	4.71	0.00	1.72	0.0	2.552
8.667	0.000	4.75	0.00	1.74	0.0	2.585
8.750	0.000	4.78	0.00	1.76	0.0	2.617
8.833	0.000	4.81	0.00	1.78	0.0	2.651
8.917	0.000	4.84	0.00	1.81	0.0	2.684
9.000	0.000	4.88	0.00	1.83	0.0	2.717
9.083	0.000	4.91	0.00	1.85	0.0	2.751
9.167	0.000	4.95	0.00	1.87	0.0	2.785
9.250	0.000	4.99	0.00	1.90	0.0	2.820
9.333	0.000	5.02	0.00	1.92	0.0	2.854
9.417	0.000	5.06	0.00	1.94	0.0	2.889
9.500	0.000	5.10	0.00	1.97	0.0	2.924
9.583	0.000	5.14	0.00	1.99	0.0	2.959
9.667	0.000	5.18	0.00	2.02	0.0	2.995
9.750	0.000	5.22	0.00	2.04	0.0	3.031
9.833	0.000	5.26	0.00	2.06	0.0	3.067
9.917	0.000	5.30	0.00	2.09	0.0	3.103
10.000	0.000	5.35	0.00	2.11	0.0	3.140

10.083	0.000	5.39	0.00	2.14	0.0	3.177
10.167	0.000	5.44	0.00	2.16	0.0	3.215
10.250	0.000	5.48	0.00	2.19	0.0	3.252
10.333	0.000	5.53	0.00	2.21	0.0	3.290
10.417	0.000	5.58	0.00	2.24	0.0	3.329
10.500	0.000	5.63	0.00	2.27	0.0	3.367
10.583	0.000	5.68	0.00	2.29	0.0	3.406
10.667	0.000	5.73	0.00	2.32	0.0	3.446
10.750	0.000	5.79	0.00	2.35	0.0	3.486
10.833	0.000	5.84	0.00	2.37	0.0	3.526
10.917	0.000	5.90	0.00	2.40	0.0	3.566
11.000	0.000	5.96	0.00	2.43	0.0	3.607
11.083	0.000	6.01	0.00	2.46	0.0	3.649
11.167	0.000	6.08	0.00	2.48	0.0	3.690
11.250	0.000	6.14	0.00	2.51	0.0	3.733
11.333	0.000	6.20	0.00	2.54	0.0	3.775
11.417	0.000	6.27	0.00	2.57	0.0	3.818
11.500	0.000	6.34	0.00	2.60	0.0	3.862
11.583	0.000	6.40	0.00	2.63	0.0	3.906
11.667	0.000	6.48	0.00	2.66	0.0	3.950
11.750	0.000	6.55	0.00	2.69	0.0	3.995
11.833	0.000	6.63	0.00	2.72	0.0	4.041
11.917	0.000	6.70	0.00	2.75	0.0	4.087
12.000	0.000	6.79	0.00	2.78	0.0	4.134
12.083	0.000	6.86	0.00	2.81	0.0	4.181
12.167	0.000	6.88	0.00	2.85	0.0	4.228
12.250	0.000	6.92	0.00	2.88	0.0	4.276
12.333	0.000	6.99	0.00	2.91	0.0	4.324
12.417	0.000	7.07	0.00	2.94	0.0	4.372
12.500	0.000	7.17	0.00	2.98	0.0	4.422
12.583	0.000	7.26	0.00	3.01	0.0	4.471
12.667	0.000	7.36	0.00	3.04	0.0	4.522
12.750	0.000	7.47	0.00	3.08	0.0	4.573
12.833	0.000	7.58	0.00	3.11	0.0	4.625
12.917	0.000	7.69	0.00	3.15	0.0	4.678
13.000	0.000	7.82	0.00	3.19	0.0	4.732
13.083	0.000	7.94	0.00	3.22	0.0	4.787
13.167	0.000	8.08	0.00	3.26	0.0	4.842
13.250	0.000	8.22	0.00	3.30	0.0	4.899
13.333	0.000	8.37	0.00	3.34	0.0	4.956
13.417	0.000	8.52	0.00	3.38	0.0	5.015
13.500	0.000	8.68	0.00	3.42	0.0	5.075
13.583	0.000	8.85	0.00	3.46	0.0	5.135
13.667	0.000	9.03	0.00	3.50	0.0	5.197
13.750	0.000	9.21	0.00	3.54	0.0	5.261
13.833	0.000	9.42	0.00	3.58	0.0	5.325
13.917	0.000	9.62	0.00	3.63	0.0	5.392
14.000	0.000	9.85	0.00	3.67	0.0	5.459
14.083	0.000	10.00	0.00	3.72	0.0	5.528
14.167	0.000	9.81	0.00	3.77	0.0	5.595
14.250	0.000	9.72	0.00	3.81	0.0	5.662
14.333	0.000	9.86	0.00	3.86	0.0	5.730
14.417	0.000	10.05	0.00	3.90	0.0	5.799
14.500	0.000	10.33	0.00	3.95	0.0	5.870
14.583	0.000	10.62	0.00	4.00	0.0	5.943
14.667	0.000	10.98	0.00	4.05	0.0	6.019
14.750	0.000	11.35	0.00	4.10	0.0	6.097
14.833	0.000	11.80	0.00	4.16	0.0	6.178
14.917	0.000	12.26	0.00	4.21	0.5	6.259
15.000	0.000	12.82	0.00	4.25	2.6	6.329
15.083	0.000	13.40	0.00	4.28	5.6	6.383
15.167	0.000	14.12	0.00	4.30	7.9	6.425
15.250	0.000	14.88	0.00	4.32	9.8	6.460
15.333	0.000	15.83	0.00	4.33	11.4	6.491
15.417	0.000	16.83	0.00	4.35	12.8	6.519
15.500	0.000	18.06	0.00	4.36	14.1	6.546
15.583	0.000	19.47	0.00	4.38	15.4	6.574
15.667	0.000	21.53	0.00	4.40	16.9	6.606
15.750	0.000	25.16	0.00	4.42	18.7	6.650
15.833	0.000	36.09	0.00	4.47	22.1	6.747
15.917	0.000	47.20	0.00	4.54	27.7	6.881
16.000	0.000	61.72	0.00	4.65	31.8	7.087
16.083	0.000	89.12	0.00	4.86	33.0	7.474

16.167	0.000	148.28	0.00	5.26	34.0	8.261
16.250	0.000	123.07	0.00	5.56	35.2	8.866
16.333	0.000	76.50	0.00	5.70	35.9	9.146
16.417	0.000	53.41	0.00	5.75	36.2	9.265
16.500	0.000	40.72	0.00	5.77	36.3	9.295
16.583	0.000	32.46	0.00	5.76	36.3	9.268
16.667	0.000	26.72	0.00	5.72	36.2	9.203
16.750	0.000	22.36	0.00	5.68	36.1	9.108
16.833	0.000	18.81	0.00	5.62	36.0	8.990
16.917	0.000	16.30	0.00	5.56	35.8	8.856
17.000	0.000	14.78	0.00	5.49	35.6	8.712
17.083	0.000	12.98	0.00	5.41	35.3	8.559
17.167	0.000	11.87	0.00	5.33	35.1	8.399
17.250	0.000	11.02	0.00	5.25	34.8	8.235
17.333	0.000	10.32	0.00	5.16	34.5	8.069
17.417	0.000	9.83	0.00	5.08	34.2	7.901
17.500	0.000	9.42	0.00	4.99	33.9	7.732
17.583	0.000	9.05	0.00	4.90	33.6	7.563
17.667	0.000	8.71	0.00	4.81	33.3	7.393
17.750	0.000	8.40	0.00	4.73	33.0	7.224
17.833	0.000	8.11	0.00	4.64	32.7	7.054
17.917	0.000	7.85	0.00	4.55	31.9	6.889
18.000	0.000	7.61	0.00	4.47	27.9	6.749
18.083	0.000	7.40	0.00	4.42	22.1	6.648
18.167	0.000	7.25	0.00	4.38	17.9	6.574
18.250	0.000	7.10	0.00	4.35	14.8	6.521
18.333	0.000	6.94	0.00	4.33	12.6	6.482
18.417	0.000	6.78	0.00	4.31	11.0	6.453
18.500	0.000	6.63	0.00	4.30	9.8	6.431
18.583	0.000	6.48	0.00	4.29	8.9	6.415
18.667	0.000	6.34	0.00	4.29	8.2	6.403
18.750	0.000	6.21	0.00	4.28	7.6	6.393
18.833	0.000	6.08	0.00	4.28	7.2	6.385
18.917	0.000	5.96	0.00	4.27	6.9	6.379
19.000	0.000	5.85	0.00	4.27	6.6	6.374
19.083	0.000	5.74	0.00	4.27	6.4	6.370
19.167	0.000	5.64	0.00	4.27	6.2	6.366
19.250	0.000	5.54	0.00	4.27	6.0	6.363
19.333	0.000	5.45	0.00	4.26	5.9	6.360
19.417	0.000	5.36	0.00	4.26	5.7	6.357
19.500	0.000	5.27	0.00	4.26	5.6	6.355
19.583	0.000	5.19	0.00	4.26	5.5	6.353
19.667	0.000	5.11	0.00	4.26	5.4	6.351
19.750	0.000	5.03	0.00	4.26	5.3	6.349
19.833	0.000	4.96	0.00	4.26	5.2	6.347
19.917	0.000	4.88	0.00	4.26	5.1	6.345
20.000	0.000	4.82	0.00	4.26	5.1	6.344
20.083	0.000	4.75	0.00	4.25	5.0	6.342
20.167	0.000	4.69	0.00	4.25	4.9	6.341
20.250	0.000	4.63	0.00	4.25	4.8	6.339
20.333	0.000	4.57	0.00	4.25	4.8	6.338
20.417	0.000	4.51	0.00	4.25	4.7	6.336
20.500	0.000	4.45	0.00	4.25	4.6	6.335
20.583	0.000	4.40	0.00	4.25	4.6	6.334
20.667	0.000	4.35	0.00	4.25	4.5	6.333
20.750	0.000	4.30	0.00	4.25	4.5	6.332
20.833	0.000	4.25	0.00	4.25	4.4	6.331
20.917	0.000	4.20	0.00	4.25	4.4	6.329
21.000	0.000	4.15	0.00	4.25	4.3	6.328
21.083	0.000	4.11	0.00	4.25	4.3	6.327
21.167	0.000	4.07	0.00	4.25	4.2	6.326
21.250	0.000	4.02	0.00	4.25	4.2	6.325
21.333	0.000	3.98	0.00	4.25	4.1	6.325
21.417	0.000	3.94	0.00	4.24	4.1	6.324
21.500	0.000	3.90	0.00	4.24	4.0	6.323
21.583	0.000	3.86	0.00	4.24	4.0	6.322
21.667	0.000	3.83	0.00	4.24	3.9	6.321
21.750	0.000	3.79	0.00	4.24	3.9	6.320
21.833	0.000	3.76	0.00	4.24	3.9	6.320
21.917	0.000	3.72	0.00	4.24	3.8	6.319
22.000	0.000	3.69	0.00	4.24	3.8	6.318
22.083	0.000	3.65	0.00	4.24	3.8	6.317
22.167	0.000	3.62	0.00	4.24	3.7	6.317

PEAK DISCHARGE

22.250	0.000	3.59	0.00	4.24	3.7	6.316
22.333	0.000	3.56	0.00	4.24	3.7	6.315
22.417	0.000	3.53	0.00	4.24	3.6	6.315
22.500	0.000	3.50	0.00	4.24	3.6	6.314
22.583	0.000	3.47	0.00	4.24	3.6	6.313
22.667	0.000	3.44	0.00	4.24	3.5	6.313
22.750	0.000	3.42	0.00	4.24	3.5	6.312
22.833	0.000	3.39	0.00	4.24	3.5	6.311
22.917	0.000	3.36	0.00	4.24	3.4	6.311
23.000	0.000	3.34	0.00	4.24	3.4	6.310
23.083	0.000	3.31	0.00	4.24	3.4	6.310
23.167	0.000	3.29	0.00	4.24	3.4	6.309
23.250	0.000	3.26	0.00	4.24	3.3	6.309
23.333	0.000	3.24	0.00	4.24	3.3	6.308
23.417	0.000	3.22	0.00	4.24	3.3	6.308
23.500	0.000	3.19	0.00	4.24	3.3	6.307
23.583	0.000	3.17	0.00	4.24	3.2	6.307
23.667	0.000	3.15	0.00	4.24	3.2	6.306
23.750	0.000	3.13	0.00	4.24	3.2	6.306
23.833	0.000	3.10	0.00	4.24	3.2	6.305
23.917	0.000	3.08	0.00	4.23	3.1	6.305

```
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     16.082 AF
    BASIN  STORAGE =      5.031 AF (WITH      0.000 AF INITIALLY FILLED)
    OUTFLOW VOLUME =     11.053 AF
    LOSS    VOLUME =      0.000 AF
==============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
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↑

JOB #4099
BASIN #2 DETENTION VOLUME

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Discharge (cfs)	
2981.00	0.00	35,170					
			18,069	18,069	0.41	0.0	
2981.50	0.50	37,107					
			19,046	37,115	0.85	0.0	
2982.00	1.00	39,077					
			20,038	57,153	1.31	0.0	
2982.50	1.50	41,073					
			21,043	78,195	1.80	0.0	
2983.00	2.00	43,097					
			22,061	100,257	2.30	0.0	
2983.50	2.50	45,148					
			23,093	123,350	2.83	0.0	
2984.00	3.00	47,225					
			24,139	147,488	3.39	0.0	
2984.50	3.50	49,329					
			25,198	172,686	3.96	0.0	
2985.00	4.00	51,461					
			20,929	193,615	4.44	0.0	
10-YR HCOC → 2985.40	4.40	53,185					
			5,340	198,955	4.57	18.1	
2985.50	4.50	53,618					
			27,356	226,311	5.20	19.1	
2986.00	5.00	55,804					
			28,455	254,766	5.85	20.0	
2986.50	5.50	58,016					
			29,568	284,333	6.53	20.9	V=6.56 ac ft
2987.00	6.00	60,254					D=6.03'
DET. 2987.03			30,694	315,027	7.23	21.7	100^{YR} Q= 20.9 cfs
2987.50	6.50	62,520					
			31,833	346,860	7.96	22.5	
2988.00	7.00	64,813					
			32,986	379,846	8.72	23.3	
2988.50	7.50	67,132					
			34,153	413,999	9.50	24.1	
2989.00	8.00	69,479					
			35,572	449,571	10.32	24.8	
2989.50	8.50	72,808					
			38,748	488,318	11.21	25.6	
2990.00	9.00	82,183					

18" RISER

Calculations - Orifice Equation for 18" riser with an a calculated opening of 1.77 ft^2

$$Q = C \times A \times \sqrt{64.4 \times H}$$

$$Q = 0.6 \times 1.77 \sqrt{64.4 \times 6.03}$$

$$Q = 20.9 \text{ cfs}$$

A = Area Opening (1.77)
H = Height at 2987.03 (6.03 ft.)

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****************************************************************************

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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                        *
* DETENTION BASIN #2                                                      *
* HYDROGRAPH                                                              *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\DETB2.DAT
  TIME/DATE OF STUDY: 17:50 08/29/2024


****************************************************************************
  FLOW PROCESS FROM NODE   400.00 TO NODE   401.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      45.370 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.140 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.
         DESERT(UNDEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.057
         LOW LOSS FRACTION = 0.138
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.35
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.84
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.05
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.50
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  1.94
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  3.29

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.998
          30-MINUTE FACTOR = 0.998
           1-HOUR FACTOR = 0.998
           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 =  59.524


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 5.496                 30.157
        2                40.999                194.800
```

3	67.773	146.909
4	79.221	62.815
5	85.931	36.818
6	90.304	23.991
7	93.290	16.384
8	95.433	11.757
9	96.969	8.431
10	97.941	5.333
11	98.600	3.618
12	99.301	3.842
13	99.720	2.303
14	99.930	1.151
15	100.000	0.384

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.3797
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 11.0524

↑

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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

==========

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 50.0 100.0 150.0 200.0
0.083	0.0008	0.11	Q . . . .
0.167	0.0066	0.85	Q . . . .
0.250	0.0162	1.40	Q . . . .
0.333	0.0275	1.64	Q . . . .
0.417	0.0398	1.78	Q . . . .
0.500	0.0527	1.88	Q . . . .
0.583	0.0662	1.95	Q . . . .
0.667	0.0799	2.00	Q . . . .
0.750	0.0939	2.04	Q . . . .
0.833	0.1081	2.06	Q . . . .
0.917	0.1225	2.08	Q . . . .
1.000	0.1370	2.10	Q . . . .
1.083	0.1516	2.12	Q . . . .
1.167	0.1663	2.13	Q . . . .
1.250	0.1810	2.14	Q . . . .
1.333	0.1958	2.15	Q . . . .
1.417	0.2106	2.16	Q . . . .
1.500	0.2255	2.16	Q . . . .
1.583	0.2405	2.17	Q . . . .
1.667	0.2555	2.18	Q . . . .
1.750	0.2705	2.19	Q . . . .
1.833	0.2856	2.19	QV . . . .
1.917	0.3008	2.20	QV . . . .
2.000	0.3160	2.21	QV . . . .
2.083	0.3313	2.22	QV . . . .
2.167	0.3466	2.23	QV . . . .
2.250	0.3620	2.23	QV . . . .
2.333	0.3774	2.24	QV . . . .
2.417	0.3929	2.25	QV . . . .
2.500	0.4085	2.26	QV . . . .
2.583	0.4241	2.27	QV . . . .
2.667	0.4398	2.28	QV . . . .
2.750	0.4555	2.28	QV . . . .
2.833	0.4713	2.29	QV . . . .
2.917	0.4871	2.30	QV . . . .
3.000	0.5031	2.31	QV . . . .
3.083	0.5190	2.32	QV . . . .
3.167	0.5351	2.33	QV . . . .
3.250	0.5512	2.34	QV . . . .
3.333	0.5673	2.35	Q V . . . .
3.417	0.5836	2.36	Q V . . . .
3.500	0.5999	2.37	Q V . . . .

3.583	0.6162	2.38	Q	V	.	.	.	.
3.667	0.6327	2.39	Q	V	.	.	.	.
3.750	0.6492	2.40	Q	V	.	.	.	.
3.833	0.6657	2.41	Q	V	.	.	.	.
3.917	0.6824	2.42	Q	V	.	.	.	.
4.000	0.6991	2.43	Q	V	.	.	.	.
4.083	0.7159	2.44	Q	V	.	.	.	.
4.167	0.7327	2.45	Q	V	.	.	.	.
4.250	0.7496	2.46	Q	V	.	.	.	.
4.333	0.7666	2.47	Q	V	.	.	.	.
4.417	0.7837	2.48	Q	V	.	.	.	.
4.500	0.8008	2.49	Q	V	.	.	.	.
4.583	0.8180	2.50	Q	V	.	.	.	.
4.667	0.8353	2.51	Q	V	.	.	.	.
4.750	0.8527	2.52	Q	V	.	.	.	.
4.833	0.8702	2.53	Q	V	.	.	.	.
4.917	0.8877	2.54	Q	V	.	.	.	.
5.000	0.9053	2.56	Q	V	.	.	.	.
5.083	0.9230	2.57	Q	V	.	.	.	.
5.167	0.9408	2.58	Q	V	.	.	.	.
5.250	0.9586	2.59	Q	V	.	.	.	.
5.333	0.9766	2.60	Q	V	.	.	.	.
5.417	0.9946	2.62	Q	V	.	.	.	.
5.500	1.0127	2.63	Q	V	.	.	.	.
5.583	1.0309	2.64	Q	V	.	.	.	.
5.667	1.0492	2.66	Q	V	.	.	.	.
5.750	1.0675	2.67	Q	V	.	.	.	.
5.833	1.0860	2.68	Q	V	.	.	.	.
5.917	1.1046	2.69	Q	V	.	.	.	.
6.000	1.1232	2.71	Q	V	.	.	.	.
6.083	1.1420	2.72	Q	V	.	.	.	.
6.167	1.1608	2.74	Q	V	.	.	.	.
6.250	1.1797	2.75	Q	V	.	.	.	.
6.333	1.1988	2.76	Q	V	.	.	.	.
6.417	1.2179	2.78	Q	V	.	.	.	.
6.500	1.2371	2.79	Q	V	.	.	.	.
6.583	1.2565	2.81	Q	V	.	.	.	.
6.667	1.2759	2.82	Q	V	.	.	.	.
6.750	1.2955	2.84	Q	V	.	.	.	.
6.833	1.3151	2.85	Q	V	.	.	.	.
6.917	1.3349	2.87	Q	V	.	.	.	.
7.000	1.3548	2.89	Q	V	.	.	.	.
7.083	1.3747	2.90	Q	V	.	.	.	.
7.167	1.3948	2.92	Q	V	.	.	.	.
7.250	1.4150	2.93	Q	V	.	.	.	.
7.333	1.4354	2.95	Q	V	.	.	.	.
7.417	1.4558	2.97	Q	V	.	.	.	.
7.500	1.4764	2.99	Q	V	.	.	.	.
7.583	1.4971	3.00	Q	V	.	.	.	.
7.667	1.5179	3.02	Q	V	.	.	.	.
7.750	1.5388	3.04	Q	V	.	.	.	.
7.833	1.5599	3.06	Q	V	.	.	.	.
7.917	1.5811	3.08	Q	V	.	.	.	.
8.000	1.6024	3.10	Q	V	.	.	.	.
8.083	1.6239	3.12	Q	V	.	.	.	.
8.167	1.6455	3.14	Q	V	.	.	.	.
8.250	1.6672	3.16	Q	V	.	.	.	.
8.333	1.6891	3.18	Q	V	.	.	.	.
8.417	1.7111	3.20	Q	V	.	.	.	.
8.500	1.7332	3.22	Q	V	.	.	.	.
8.583	1.7556	3.24	Q	V	.	.	.	.
8.667	1.7780	3.26	Q	V	.	.	.	.
8.750	1.8006	3.28	Q	V	.	.	.	.
8.833	1.8234	3.31	Q	V	.	.	.	.
8.917	1.8463	3.33	Q	V	.	.	.	.
9.000	1.8694	3.35	Q	V	.	.	.	.
9.083	1.8927	3.38	Q	V	.	.	.	.
9.167	1.9161	3.40	Q	V	.	.	.	.
9.250	1.9397	3.43	Q	V	.	.	.	.
9.333	1.9635	3.45	Q	V	.	.	.	.
9.417	1.9875	3.48	Q	V	.	.	.	.
9.500	2.0116	3.51	Q	V	.	.	.	.
9.583	2.0359	3.53	Q	V	.	.	.	.

9.667	2.0605	3.56	Q	V	.	.	.	.
9.750	2.0852	3.59	Q	V	.	.	.	.
9.833	2.1101	3.62	Q	V	.	.	.	.
9.917	2.1352	3.64	Q	V	.	.	.	.
10.000	2.1605	3.68	Q	V	.	.	.	.
10.083	2.1860	3.71	Q	V	.	.	.	.
10.167	2.2117	3.74	Q	V	.	.	.	.
10.250	2.2377	3.77	Q	V	.	.	.	.
10.333	2.2639	3.80	Q	V	.	.	.	.
10.417	2.2903	3.83	Q	V	.	.	.	.
10.500	2.3169	3.87	Q	V	.	.	.	.
10.583	2.3438	3.90	Q	V	.	.	.	.
10.667	2.3710	3.94	Q	V	.	.	.	.
10.750	2.3984	3.98	Q	V	.	.	.	.
10.833	2.4260	4.02	Q	V	.	.	.	.
10.917	2.4539	4.05	Q	V	.	.	.	.
11.000	2.4821	4.09	Q	V	.	.	.	.
11.083	2.5106	4.13	Q	V	.	.	.	.
11.167	2.5393	4.18	Q	V	.	.	.	.
11.250	2.5684	4.22	Q	V	.	.	.	.
11.333	2.5977	4.26	Q	V	.	.	.	.
11.417	2.6274	4.31	Q	V	.	.	.	.
11.500	2.6574	4.35	Q	V	.	.	.	.
11.583	2.6877	4.40	Q	V	.	.	.	.
11.667	2.7183	4.45	Q	V	.	.	.	.
11.750	2.7493	4.50	Q	V	.	.	.	.
11.833	2.7807	4.55	Q	V	.	.	.	.
11.917	2.8124	4.61	Q	V	.	.	.	.
12.000	2.8445	4.66	Q	V	.	.	.	.
12.083	2.8770	4.71	Q	V	.	.	.	.
12.167	2.9095	4.73	Q	V	.	.	.	.
12.250	2.9423	4.75	Q	V	.	.	.	.
12.333	2.9754	4.81	Q	V	.	.	.	.
12.417	3.0089	4.86	Q	V	.	.	.	.
12.500	3.0428	4.92	Q	.V	.	.	.	.
12.583	3.0771	4.99	Q	.V	.	.	.	.
12.667	3.1120	5.06	.Q	.V	.	.	.	.
12.750	3.1473	5.13	.Q	.V	.	.	.	.
12.833	3.1832	5.21	.Q	.V	.	.	.	.
12.917	3.2196	5.29	.Q	.V	.	.	.	.
13.000	3.2566	5.37	.Q	.V	.	.	.	.
13.083	3.2942	5.46	.Q	.V	.	.	.	.
13.167	3.3324	5.55	.Q	. V	.	.	.	.
13.250	3.3713	5.65	.Q	. V	.	.	.	.
13.333	3.4109	5.75	.Q	. V	.	.	.	.
13.417	3.4512	5.85	.Q	. V	.	.	.	.
13.500	3.4923	5.97	.Q	. V	.	.	.	.
13.583	3.5341	6.08	.Q	. V	.	.	.	.
13.667	3.5769	6.20	.Q	. V	.	.	.	.
13.750	3.6205	6.33	.Q	. V	.	.	.	.
13.833	3.6650	6.47	.Q	. V	.	.	.	.
13.917	3.7105	6.61	.Q	. V	.	.	.	.
14.000	3.7571	6.77	.Q	. V	.	.	.	.
14.083	3.8044	6.87	.Q	. V	.	.	.	.
14.167	3.8508	6.73	.Q	. V	.	.	.	.
14.250	3.8968	6.67	.Q	. V	.	.	.	.
14.333	3.9433	6.76	.Q	. V	.	.	.	.
14.417	3.9908	6.90	.Q	. V	.	.	.	.
14.500	4.0396	7.09	.Q	. V	.	.	.	.
14.583	4.0898	7.28	.Q	. V	.	.	.	.
14.667	4.1417	7.53	.Q	. V	.	.	.	.
14.750	4.1953	7.78	.Q	. V	.	.	.	.
14.833	4.2510	8.09	.Q	. V	.	.	.	.
14.917	4.3089	8.41	.Q	. V	.	.	.	.
15.000	4.3695	8.80	.Q	. V	.	.	.	.
15.083	4.4329	9.20	.Q	. V	.	.	.	.
15.167	4.4996	9.69	.Q	. V	.	.	.	.
15.250	4.5699	10.21	. Q	. V	.	.	.	.
15.333	4.6447	10.86	. Q	. V	.	.	.	.
15.417	4.7243	11.55	. Q	. V	.	.	.	.
15.500	4.8098	12.41	. Q	. V	.	.	.	.
15.583	4.9019	13.38	. Q	. V	.	.	.	.
15.667	5.0039	14.81	. Q	. V	.	.	.	.

15.750	5.1231	17.31	. Q . V . . .
15.833	5.2940	24.82	. Q . V. . .
15.917	5.5176	32.47	. Q . V. . .
16.000	5.8100	42.45	. Q . .V . .
16.083	6.2322	61.30	. . Q . V . .
16.167	6.9346	101.99	. . Q V . .
16.250	7.5177	84.66	. . Q . V . .
16.333	7.8801	52.63	. Q . V . .
16.417	8.1331	36.74	. Q . . V. .
16.500	8.3259	28.00	. Q . . V .
16.583	8.4796	22.31	. Q . . V .
16.667	8.6060	18.36	. Q . . .V .
16.750	8.7118	15.36	. Q . . .V .
16.833	8.8008	12.92	. Q . . .V .
16.917	8.8778	11.19	. Q . . . V .
17.000	8.9477	10.14	. Q . . . V .
17.083	9.0091	8.91	.Q . . . V .
17.167	9.0652	8.15	.Q . . . V .
17.250	9.1173	7.57	.Q . . . V .
17.333	9.1661	7.09	.Q . . . V .
17.417	9.2126	6.76	.Q . . . V .
17.500	9.2572	6.47	.Q . . . V .
17.583	9.3000	6.21	.Q . . . V .
17.667	9.3412	5.98	.Q . . . V .
17.750	9.3809	5.77	.Q . . . V .
17.833	9.4193	5.57	.Q . . . V .
17.917	9.4565	5.39	.Q . . . V .
18.000	9.4925	5.23	.Q . . . V .
18.083	9.5275	5.08	.Q . . . V .
18.167	9.5618	4.98	Q . . . V .
18.250	9.5954	4.88	Q . . . V .
18.333	9.6283	4.77	Q . . . V .
18.417	9.6604	4.66	Q . . . V .
18.500	9.6917	4.55	Q . . . V .
18.583	9.7224	4.45	Q . . . V .
18.667	9.7524	4.36	Q . . . V .
18.750	9.7818	4.27	Q . . . V .
18.833	9.8106	4.18	Q . . . V .
18.917	9.8388	4.10	Q . . . V .
19.000	9.8665	4.02	Q . . . V .
19.083	9.8937	3.95	Q . . . V .
19.167	9.9204	3.88	Q . . . V .
19.250	9.9466	3.81	Q . . . V .
19.333	9.9724	3.74	Q . . . V .
19.417	9.9978	3.68	Q . . . V .
19.500	10.0227	3.62	Q . . . V .
19.583	10.0472	3.56	Q . . . V .
19.667	10.0714	3.51	Q . . . V .
19.750	10.0952	3.46	Q . . . V .
19.833	10.1186	3.41	Q . . . V .
19.917	10.1418	3.36	Q . . . V .
20.000	10.1646	3.31	Q . . . V .
20.083	10.1870	3.26	Q . . . V .
20.167	10.2092	3.22	Q . . . V .
20.250	10.2311	3.18	Q . . . V .
20.333	10.2527	3.14	Q . . . V .
20.417	10.2741	3.10	Q . . . V .
20.500	10.2951	3.06	Q . . . V .
20.583	10.3160	3.02	Q . . . V .
20.667	10.3365	2.99	Q . . . V .
20.750	10.3569	2.95	Q . . . V .
20.833	10.3770	2.92	Q . . . V .
20.917	10.3969	2.89	Q . . . V .
21.000	10.4165	2.86	Q . . . V .
21.083	10.4360	2.82	Q . . . V .
21.167	10.4552	2.79	Q . . . V .
21.250	10.4743	2.77	Q . . . V .
21.333	10.4931	2.74	Q . . . V .
21.417	10.5118	2.71	Q . . . V .
21.500	10.5303	2.68	Q . . . V .
21.583	10.5485	2.66	Q . . . V .
21.667	10.5667	2.63	Q . . . V .
21.750	10.5846	2.61	Q . . . V .

```
  21.833     10.6024      2.58  Q          .          .          .        V .
  21.917     10.6200      2.56  Q          .          .          .        V .
  22.000     10.6374      2.53  Q          .          .          .        V .
  22.083     10.6547      2.51  Q          .          .          .        V .
  22.167     10.6719      2.49  Q          .          .          .        V .
  22.250     10.6889      2.47  Q          .          .          .        V .
  22.333     10.7057      2.45  Q          .          .          .        V .
  22.417     10.7225      2.43  Q          .          .          .        V .
  22.500     10.7390      2.41  Q          .          .          .        V .
  22.583     10.7555      2.39  Q          .          .          .        V .
  22.667     10.7718      2.37  Q          .          .          .        V .
  22.750     10.7879      2.35  Q          .          .          .         V.
  22.833     10.8040      2.33  Q          .          .          .         V.
  22.917     10.8199      2.31  Q          .          .          .         V.
  23.000     10.8357      2.29  Q          .          .          .         V.
  23.083     10.8514      2.28  Q          .          .          .         V.
  23.167     10.8669      2.26  Q          .          .          .         V.
  23.250     10.8824      2.24  Q          .          .          .         V.
  23.333     10.8977      2.23  Q          .          .          .         V.
  23.417     10.9129      2.21  Q          .          .          .         V.
  23.500     10.9280      2.19  Q          .          .          .         V.
  23.583     10.9430      2.18  Q          .          .          .         V.
  23.667     10.9579      2.16  Q          .          .          .         V.
  23.750     10.9727      2.15  Q          .          .          .         V.
  23.833     10.9874      2.13  Q          .          .          .         V.
  23.917     11.0020      2.12  Q          .          .          .         V.
  24.000     11.0165      2.10  Q          .          .          .         V.
  24.083     11.0301      1.98  Q          .          .          .         V.
  24.167     11.0386      1.23  Q          .          .          .         V.
  24.250     11.0433      0.68  Q          .          .          .         V.
  24.333     11.0463      0.44  Q          .          .          .         V.
  24.417     11.0483      0.30  Q          .          .          .         V.
  24.500     11.0497      0.20  Q          .          .          .         V.
  24.583     11.0507      0.14  Q          .          .          .         V.
  24.667     11.0513      0.10  Q          .          .          .         V.
  24.750     11.0518      0.06  Q          .          .          .         V.
  24.833     11.0521      0.04  Q          .          .          .         V.
  24.917     11.0523      0.03  Q          .          .          .         V.
  25.000     11.0524      0.01  Q          .          .          .         V.
  25.083     11.0524      0.01  Q          .          .          .         V.

****************************************************************************
  FLOW PROCESS FROM NODE   400.00 TO NODE   401.00 IS CODE = 3.1
----------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
============================================================================

                    INFLOW
                  (STREAM 1)
                       |
                       |
                       V                __effective depth
                 -----------            |   (and volume)
                |           |    |     |
                |           |    |....V........
                | detention |<-->|           outflow
                |   basin   |    |.........._______
                 -----------     |     ^    |  \
                       |         |  dead    |   basin outlet
                       V         | storage |
                    OUTFLOW       ---------
                  (STREAM 1)


         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	4.40	0.01	4.440
3	4.50	18.10	4.570
4	5.00	19.10	5.200
5	5.50	20.00	5.850
6	6.00	20.90	6.530
7	6.50	21.70	7.230
8	7.00	22.50	7.960
9	7.50	23.30	8.720
10	8.00	24.10	9.500
11	8.50	24.80	10.320
12	9.00	25.60	11.210

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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	0.11	0.00	0.00	0.0	0.001
0.167	0.000	0.85	0.00	0.01	0.0	0.007
0.250	0.000	1.40	0.00	0.02	0.0	0.016
0.333	0.000	1.64	0.00	0.03	0.0	0.028
0.417	0.000	1.78	0.00	0.04	0.0	0.040
0.500	0.000	1.88	0.00	0.05	0.0	0.053
0.583	0.000	1.95	0.00	0.07	0.0	0.066
0.667	0.000	2.00	0.00	0.08	0.0	0.080
0.750	0.000	2.04	0.00	0.09	0.0	0.094
0.833	0.000	2.06	0.00	0.11	0.0	0.108
0.917	0.000	2.08	0.00	0.12	0.0	0.122
1.000	0.000	2.10	0.00	0.14	0.0	0.137
1.083	0.000	2.12	0.00	0.15	0.0	0.152
1.167	0.000	2.13	0.00	0.16	0.0	0.166
1.250	0.000	2.14	0.00	0.18	0.0	0.181
1.333	0.000	2.15	0.00	0.19	0.0	0.196
1.417	0.000	2.16	0.00	0.21	0.0	0.211
1.500	0.000	2.16	0.00	0.22	0.0	0.225
1.583	0.000	2.17	0.00	0.24	0.0	0.240
1.667	0.000	2.18	0.00	0.25	0.0	0.255
1.750	0.000	2.19	0.00	0.27	0.0	0.270
1.833	0.000	2.19	0.00	0.28	0.0	0.286
1.917	0.000	2.20	0.00	0.30	0.0	0.301
2.000	0.000	2.21	0.00	0.31	0.0	0.316
2.083	0.000	2.22	0.00	0.33	0.0	0.331
2.167	0.000	2.23	0.00	0.34	0.0	0.347
2.250	0.000	2.23	0.00	0.36	0.0	0.362
2.333	0.000	2.24	0.00	0.37	0.0	0.377
2.417	0.000	2.25	0.00	0.39	0.0	0.393
2.500	0.000	2.26	0.00	0.40	0.0	0.408
2.583	0.000	2.27	0.00	0.42	0.0	0.424
2.667	0.000	2.28	0.00	0.44	0.0	0.440
2.750	0.000	2.28	0.00	0.45	0.0	0.455
2.833	0.000	2.29	0.00	0.47	0.0	0.471
2.917	0.000	2.30	0.00	0.48	0.0	0.487
3.000	0.000	2.31	0.00	0.50	0.0	0.503
3.083	0.000	2.32	0.00	0.51	0.0	0.519
3.167	0.000	2.33	0.00	0.53	0.0	0.535
3.250	0.000	2.34	0.00	0.55	0.0	0.551
3.333	0.000	2.35	0.00	0.56	0.0	0.567
3.417	0.000	2.36	0.00	0.58	0.0	0.583
3.500	0.000	2.37	0.00	0.59	0.0	0.600
3.583	0.000	2.38	0.00	0.61	0.0	0.616
3.667	0.000	2.39	0.00	0.63	0.0	0.632

3.750	0.000	2.40	0.00	0.64	0.0	0.649
3.833	0.000	2.41	0.00	0.66	0.0	0.666
3.917	0.000	2.42	0.00	0.68	0.0	0.682
4.000	0.000	2.43	0.00	0.69	0.0	0.699
4.083	0.000	2.44	0.00	0.71	0.0	0.716
4.167	0.000	2.45	0.00	0.73	0.0	0.732
4.250	0.000	2.46	0.00	0.74	0.0	0.749
4.333	0.000	2.47	0.00	0.76	0.0	0.766
4.417	0.000	2.48	0.00	0.78	0.0	0.783
4.500	0.000	2.49	0.00	0.79	0.0	0.800
4.583	0.000	2.50	0.00	0.81	0.0	0.818
4.667	0.000	2.51	0.00	0.83	0.0	0.835
4.750	0.000	2.52	0.00	0.84	0.0	0.852
4.833	0.000	2.53	0.00	0.86	0.0	0.870
4.917	0.000	2.54	0.00	0.88	0.0	0.887
5.000	0.000	2.56	0.00	0.90	0.0	0.905
5.083	0.000	2.57	0.00	0.91	0.0	0.923
5.167	0.000	2.58	0.00	0.93	0.0	0.940
5.250	0.000	2.59	0.00	0.95	0.0	0.958
5.333	0.000	2.60	0.00	0.97	0.0	0.976
5.417	0.000	2.62	0.00	0.99	0.0	0.994
5.500	0.000	2.63	0.00	1.00	0.0	1.012
5.583	0.000	2.64	0.00	1.02	0.0	1.030
5.667	0.000	2.66	0.00	1.04	0.0	1.049
5.750	0.000	2.67	0.00	1.06	0.0	1.067
5.833	0.000	2.68	0.00	1.08	0.0	1.085
5.917	0.000	2.69	0.00	1.09	0.0	1.104
6.000	0.000	2.71	0.00	1.11	0.0	1.123
6.083	0.000	2.72	0.00	1.13	0.0	1.141
6.167	0.000	2.74	0.00	1.15	0.0	1.160
6.250	0.000	2.75	0.00	1.17	0.0	1.179
6.333	0.000	2.76	0.00	1.19	0.0	1.198
6.417	0.000	2.78	0.00	1.21	0.0	1.217
6.500	0.000	2.79	0.00	1.23	0.0	1.236
6.583	0.000	2.81	0.00	1.24	0.0	1.256
6.667	0.000	2.82	0.00	1.26	0.0	1.275
6.750	0.000	2.84	0.00	1.28	0.0	1.295
6.833	0.000	2.85	0.00	1.30	0.0	1.314
6.917	0.000	2.87	0.00	1.32	0.0	1.334
7.000	0.000	2.89	0.00	1.34	0.0	1.354
7.083	0.000	2.90	0.00	1.36	0.0	1.374
7.167	0.000	2.92	0.00	1.38	0.0	1.394
7.250	0.000	2.93	0.00	1.40	0.0	1.414
7.333	0.000	2.95	0.00	1.42	0.0	1.434
7.417	0.000	2.97	0.00	1.44	0.0	1.455
7.500	0.000	2.99	0.00	1.46	0.0	1.475
7.583	0.000	3.00	0.00	1.48	0.0	1.496
7.667	0.000	3.02	0.00	1.50	0.0	1.517
7.750	0.000	3.04	0.00	1.52	0.0	1.538
7.833	0.000	3.06	0.00	1.54	0.0	1.559
7.917	0.000	3.08	0.00	1.57	0.0	1.580
8.000	0.000	3.10	0.00	1.59	0.0	1.601
8.083	0.000	3.12	0.00	1.61	0.0	1.623
8.167	0.000	3.14	0.00	1.63	0.0	1.644
8.250	0.000	3.16	0.00	1.65	0.0	1.666
8.333	0.000	3.18	0.00	1.67	0.0	1.688
8.417	0.000	3.20	0.00	1.69	0.0	1.710
8.500	0.000	3.22	0.00	1.72	0.0	1.732
8.583	0.000	3.24	0.00	1.74	0.0	1.754
8.667	0.000	3.26	0.00	1.76	0.0	1.777
8.750	0.000	3.28	0.00	1.78	0.0	1.799
8.833	0.000	3.31	0.00	1.81	0.0	1.822
8.917	0.000	3.33	0.00	1.83	0.0	1.845
9.000	0.000	3.35	0.00	1.85	0.0	1.868
9.083	0.000	3.38	0.00	1.87	0.0	1.891
9.167	0.000	3.40	0.00	1.90	0.0	1.915
9.250	0.000	3.43	0.00	1.92	0.0	1.938
9.333	0.000	3.45	0.00	1.94	0.0	1.962
9.417	0.000	3.48	0.00	1.97	0.0	1.986
9.500	0.000	3.51	0.00	1.99	0.0	2.010
9.583	0.000	3.53	0.00	2.02	0.0	2.034
9.667	0.000	3.56	0.00	2.04	0.0	2.059
9.750	0.000	3.59	0.00	2.06	0.0	2.083

9.833	0.000	3.62	0.00	2.09	0.0	2.108
9.917	0.000	3.64	0.00	2.11	0.0	2.133
10.000	0.000	3.68	0.00	2.14	0.0	2.159
10.083	0.000	3.71	0.00	2.16	0.0	2.184
10.167	0.000	3.74	0.00	2.19	0.0	2.210
10.250	0.000	3.77	0.00	2.22	0.0	2.236
10.333	0.000	3.80	0.00	2.24	0.0	2.262
10.417	0.000	3.83	0.00	2.27	0.0	2.288
10.500	0.000	3.87	0.00	2.29	0.0	2.315
10.583	0.000	3.90	0.00	2.32	0.0	2.342
10.667	0.000	3.94	0.00	2.35	0.0	2.369
10.750	0.000	3.98	0.00	2.37	0.0	2.396
10.833	0.000	4.02	0.00	2.40	0.0	2.424
10.917	0.000	4.05	0.00	2.43	0.0	2.452
11.000	0.000	4.09	0.00	2.46	0.0	2.480
11.083	0.000	4.13	0.00	2.49	0.0	2.508
11.167	0.000	4.18	0.00	2.51	0.0	2.537
11.250	0.000	4.22	0.00	2.54	0.0	2.566
11.333	0.000	4.26	0.00	2.57	0.0	2.595
11.417	0.000	4.31	0.00	2.60	0.0	2.625
11.500	0.000	4.35	0.00	2.63	0.0	2.655
11.583	0.000	4.40	0.00	2.66	0.0	2.685
11.667	0.000	4.45	0.00	2.69	0.0	2.716
11.750	0.000	4.50	0.00	2.72	0.0	2.746
11.833	0.000	4.55	0.00	2.75	0.0	2.778
11.917	0.000	4.61	0.00	2.78	0.0	2.809
12.000	0.000	4.66	0.00	2.82	0.0	2.842
12.083	0.000	4.71	0.00	2.85	0.0	2.874
12.167	0.000	4.73	0.00	2.88	0.0	2.906
12.250	0.000	4.75	0.00	2.91	0.0	2.939
12.333	0.000	4.81	0.00	2.95	0.0	2.972
12.417	0.000	4.86	0.00	2.98	0.0	3.006
12.500	0.000	4.92	0.00	3.01	0.0	3.039
12.583	0.000	4.99	0.00	3.05	0.0	3.074
12.667	0.000	5.06	0.00	3.08	0.0	3.109
12.750	0.000	5.13	0.00	3.12	0.0	3.144
12.833	0.000	5.21	0.00	3.15	0.0	3.180
12.917	0.000	5.29	0.00	3.19	0.0	3.216
13.000	0.000	5.37	0.00	3.22	0.0	3.253
13.083	0.000	5.46	0.00	3.26	0.0	3.291
13.167	0.000	5.55	0.00	3.30	0.0	3.329
13.250	0.000	5.65	0.00	3.34	0.0	3.368
13.333	0.000	5.75	0.00	3.38	0.0	3.407
13.417	0.000	5.85	0.00	3.42	0.0	3.447
13.500	0.000	5.97	0.00	3.46	0.0	3.488
13.583	0.000	6.08	0.00	3.50	0.0	3.530
13.667	0.000	6.20	0.00	3.54	0.0	3.573
13.750	0.000	6.33	0.00	3.58	0.0	3.616
13.833	0.000	6.47	0.00	3.63	0.0	3.661
13.917	0.000	6.61	0.00	3.67	0.0	3.706
14.000	0.000	6.77	0.00	3.72	0.0	3.753
14.083	0.000	6.87	0.00	3.77	0.0	3.800
14.167	0.000	6.73	0.00	3.81	0.0	3.846
14.250	0.000	6.67	0.00	3.86	0.0	3.892
14.333	0.000	6.76	0.00	3.90	0.0	3.939
14.417	0.000	6.90	0.00	3.95	0.0	3.986
14.500	0.000	7.09	0.00	4.00	0.0	4.035
14.583	0.000	7.28	0.00	4.05	0.0	4.085
14.667	0.000	7.53	0.00	4.10	0.0	4.137
14.750	0.000	7.78	0.00	4.15	0.0	4.190
14.833	0.000	8.09	0.00	4.21	0.0	4.246
14.917	0.000	8.41	0.00	4.27	0.0	4.304
15.000	0.000	8.80	0.00	4.33	0.0	4.364
15.083	0.000	9.20	0.00	4.39	0.0	4.428
15.167	0.000	9.69	0.00	4.43	2.6	4.477
15.250	0.000	10.21	0.00	4.45	6.8	4.500
15.333	0.000	10.86	0.00	4.46	9.2	4.512
15.417	0.000	11.55	0.00	4.46	10.5	4.519
15.500	0.000	12.41	0.00	4.47	11.5	4.526
15.583	0.000	13.38	0.00	4.47	12.4	4.532
15.667	0.000	14.81	0.00	4.48	13.5	4.541
15.750	0.000	17.31	0.00	4.49	15.2	4.556
15.833	0.000	24.82	0.00	4.53	17.2	4.609

15.917	0.000	32.47	0.00	4.61	18.2	4.707
16.000	0.000	42.45	0.00	4.74	18.4	4.872
16.083	0.000	61.30	0.00	4.97	18.8	5.165
16.167	0.000	101.99	0.00	5.41	19.4	5.733
16.250	0.000	84.66	0.00	5.74	20.1	6.178
16.333	0.000	52.63	0.00	5.90	20.6	6.398
16.417	0.000	36.74	0.00	5.98	20.8	6.508
16.500	0.000	28.00	0.00	6.02	20.9	6.557
16.583	0.000	22.31	0.00	6.03	20.9	6.567
16.667	0.000	18.36	0.00	6.01	20.9	6.549
16.750	0.000	15.36	0.00	5.99	20.9	6.511
16.833	0.000	12.92	0.00	5.95	20.8	6.456
16.917	0.000	11.19	0.00	5.90	20.8	6.390
17.000	0.000	10.14	0.00	5.84	20.7	6.318
17.083	0.000	8.91	0.00	5.78	20.6	6.237
17.167	0.000	8.15	0.00	5.72	20.5	6.153
17.250	0.000	7.57	0.00	5.66	20.3	6.065
17.333	0.000	7.09	0.00	5.59	20.2	5.974
17.417	0.000	6.76	0.00	5.52	20.1	5.882
17.500	0.000	6.47	0.00	5.45	20.0	5.789
17.583	0.000	6.21	0.00	5.38	19.9	5.695
17.667	0.000	5.98	0.00	5.31	19.7	5.601
17.750	0.000	5.77	0.00	5.24	19.6	5.506
17.833	0.000	5.57	0.00	5.16	19.5	5.410
17.917	0.000	5.39	0.00	5.09	19.3	5.314
18.000	0.000	5.23	0.00	5.01	19.2	5.218
18.083	0.000	5.08	0.00	4.94	19.1	5.122
18.167	0.000	4.98	0.00	4.86	18.9	5.026
18.250	0.000	4.88	0.00	4.79	18.7	4.930
18.333	0.000	4.77	0.00	4.71	18.6	4.835
18.417	0.000	4.66	0.00	4.64	18.4	4.740
18.500	0.000	4.55	0.00	4.56	18.3	4.646
18.583	0.000	4.45	0.00	4.49	17.3	4.557
18.667	0.000	4.36	0.00	4.45	12.5	4.502
18.750	0.000	4.27	0.00	4.43	7.2	4.481
18.833	0.000	4.18	0.00	4.43	5.3	4.474
18.917	0.000	4.10	0.00	4.42	4.5	4.471
19.000	0.000	4.02	0.00	4.42	4.2	4.470
19.083	0.000	3.95	0.00	4.42	4.1	4.469
19.167	0.000	3.88	0.00	4.42	4.0	4.468
19.250	0.000	3.81	0.00	4.42	3.9	4.468
19.333	0.000	3.74	0.00	4.42	3.8	4.467
19.417	0.000	3.68	0.00	4.42	3.7	4.467
19.500	0.000	3.62	0.00	4.42	3.7	4.466
19.583	0.000	3.56	0.00	4.42	3.6	4.466
19.667	0.000	3.51	0.00	4.42	3.6	4.465
19.750	0.000	3.46	0.00	4.42	3.5	4.465
19.833	0.000	3.41	0.00	4.42	3.5	4.465
19.917	0.000	3.36	0.00	4.42	3.4	4.464
20.000	0.000	3.31	0.00	4.42	3.4	4.464
20.083	0.000	3.26	0.00	4.42	3.3	4.464
20.167	0.000	3.22	0.00	4.42	3.3	4.463
20.250	0.000	3.18	0.00	4.42	3.2	4.463
20.333	0.000	3.14	0.00	4.42	3.2	4.463
20.417	0.000	3.10	0.00	4.42	3.1	4.462
20.500	0.000	3.06	0.00	4.42	3.1	4.462
20.583	0.000	3.02	0.00	4.42	3.1	4.462
20.667	0.000	2.99	0.00	4.42	3.0	4.462
20.750	0.000	2.95	0.00	4.42	3.0	4.461
20.833	0.000	2.92	0.00	4.42	3.0	4.461
20.917	0.000	2.89	0.00	4.42	2.9	4.461
21.000	0.000	2.86	0.00	4.42	2.9	4.461
21.083	0.000	2.82	0.00	4.42	2.9	4.460
21.167	0.000	2.79	0.00	4.42	2.8	4.460
21.250	0.000	2.77	0.00	4.42	2.8	4.460
21.333	0.000	2.74	0.00	4.42	2.8	4.460
21.417	0.000	2.71	0.00	4.42	2.7	4.460
21.500	0.000	2.68	0.00	4.41	2.7	4.459
21.583	0.000	2.66	0.00	4.41	2.7	4.459
21.667	0.000	2.63	0.00	4.41	2.7	4.459
21.750	0.000	2.61	0.00	4.41	2.6	4.459
21.833	0.000	2.58	0.00	4.41	2.6	4.459
21.917	0.000	2.56	0.00	4.41	2.6	4.458

PEAK DISCHARGE

22.000	0.000	2.53	0.00	4.41	2.6	4.458
22.083	0.000	2.51	0.00	4.41	2.5	4.458
22.167	0.000	2.49	0.00	4.41	2.5	4.458
22.250	0.000	2.47	0.00	4.41	2.5	4.458
22.333	0.000	2.45	0.00	4.41	2.5	4.458
22.417	0.000	2.43	0.00	4.41	2.4	4.457
22.500	0.000	2.41	0.00	4.41	2.4	4.457
22.583	0.000	2.39	0.00	4.41	2.4	4.457
22.667	0.000	2.37	0.00	4.41	2.4	4.457
22.750	0.000	2.35	0.00	4.41	2.4	4.457
22.833	0.000	2.33	0.00	4.41	2.3	4.457
22.917	0.000	2.31	0.00	4.41	2.3	4.457
23.000	0.000	2.29	0.00	4.41	2.3	4.456
23.083	0.000	2.28	0.00	4.41	2.3	4.456
23.167	0.000	2.26	0.00	4.41	2.3	4.456
23.250	0.000	2.24	0.00	4.41	2.3	4.456
23.333	0.000	2.23	0.00	4.41	2.2	4.456
23.417	0.000	2.21	0.00	4.41	2.2	4.456
23.500	0.000	2.19	0.00	4.41	2.2	4.456
23.583	0.000	2.18	0.00	4.41	2.2	4.456
23.667	0.000	2.16	0.00	4.41	2.2	4.456
23.750	0.000	2.15	0.00	4.41	2.2	4.455
23.833	0.000	2.13	0.00	4.41	2.1	4.455
23.917	0.000	2.12	0.00	4.41	2.1	4.455

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 11.052 AF

BASIN STORAGE = 3.759 AF (WITH 0.000 AF INITIALLY FILLED)

OUTFLOW VOLUME = 7.295 AF

LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

↑

JOB #4099
BASIN #3 DETENTION VOLUME

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Discharge (cfs)	
2983.11	0.00	34,854					
			13,822	13,822	0.32	0.0	
2983.50	0.39	36,026					
			18,401	32,222	0.74	0.0	
2984.00	0.89	37,576					
			19,184	51,406	1.18	0.0	
2984.50	1.39	39,161					
			19,986	71,392	1.64	0.0	
2985.00	1.89	40,781					
			21,220	92,612	2.13	0.0	
10-YR HCOC → 2985.51	2.40	42,436					
			21,207	113,819	2.61	40.3	V=2.76 ac ft
2986.00	2.89	44,124					D=3.04'
DET. 2986.15			22,493	136,312	3.13	43.6	100YR Q= 41.2 cfs
2986.50	3.39	45,846					
			23,362	159,674	3.67	46.7	
2987.00	3.89	47,602					

30" RISER

Calculations - Orifice Equation for 30" riser with an a calculated opening of 4.91 ft^2

$$Q = C \times A \times \sqrt{64.4 \times H}$$

$$Q = 0.6 \times 4.91 \sqrt{64.4 \times 3.04}$$

$$Q = 41.2 \text{ cfs}$$

A = Area Opening (4.91)
H = Height at 2986.15 (3.04 ft.)

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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* TEI JOB NO. 4099                                                        *
* DETENTION BASIN #3                                                      *
* HYDROGRAPH                                                              *
 ***************************************************************************

  FILE NAME: C:\XDRIVE\4099\DETB3.DAT
  TIME/DATE OF STUDY: 08:58 08/30/2024


****************************************************************************
  FLOW PROCESS FROM NODE   300.00 TO NODE   301.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      29.790 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.160 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.
         DESERT(UNDEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.057
         LOW LOSS FRACTION = 0.138
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.35
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.84
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.05
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.50
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  1.94
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  3.29

         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 =  52.083


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 4.251                 15.314
        2                32.932                103.331
```

3	62.363	106.033
4	75.130	45.995
5	82.536	26.682
6	87.554	18.078
7	90.936	12.185
8	93.457	9.081
9	95.325	6.731
10	96.731	5.066
11	97.703	3.503
12	98.302	2.155
13	98.912	2.201
14	99.472	2.016
15	99.789	1.141
16	99.947	0.571
17	100.000	0.190

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.9057
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 7.2575

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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

==========

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	17.5	35.0	52.5	70.0
0.083	0.0004	0.06	Q	.	.	.	.
0.167	0.0035	0.45	Q	.	.	.	.
0.250	0.0093	0.85	Q	.	.	.	.
0.333	0.0163	1.02	Q	.	.	.	.
0.417	0.0241	1.12	Q	.	.	.	.
0.500	0.0323	1.20	Q	.	.	.	.
0.583	0.0409	1.25	Q	.	.	.	.
0.667	0.0497	1.28	Q	.	.	.	.
0.750	0.0587	1.31	Q	.	.	.	.
0.833	0.0680	1.34	Q	.	.	.	.
0.917	0.0773	1.35	Q	.	.	.	.
1.000	0.0867	1.37	Q	.	.	.	.
1.083	0.0962	1.38	Q	.	.	.	.
1.167	0.1058	1.39	Q	.	.	.	.
1.250	0.1154	1.40	Q	.	.	.	.
1.333	0.1251	1.41	Q	.	.	.	.
1.417	0.1348	1.41	Q	.	.	.	.
1.500	0.1446	1.42	Q	.	.	.	.
1.583	0.1544	1.42	Q	.	.	.	.
1.667	0.1643	1.43	Q	.	.	.	.
1.750	0.1741	1.43	Q	.	.	.	.
1.833	0.1840	1.44	QV	.	.	.	.
1.917	0.1940	1.44	QV	.	.	.	.
2.000	0.2040	1.45	QV	.	.	.	.
2.083	0.2140	1.45	QV	.	.	.	.
2.167	0.2240	1.46	QV	.	.	.	.
2.250	0.2341	1.46	QV	.	.	.	.
2.333	0.2442	1.47	QV	.	.	.	.
2.417	0.2544	1.48	QV	.	.	.	.
2.500	0.2646	1.48	QV	.	.	.	.
2.583	0.2748	1.49	QV	.	.	.	.
2.667	0.2851	1.49	QV	.	.	.	.
2.750	0.2954	1.50	QV	.	.	.	.
2.833	0.3058	1.50	QV	.	.	.	.
2.917	0.3162	1.51	QV	.	.	.	.
3.000	0.3266	1.52	QV	.	.	.	.
3.083	0.3371	1.52	QV	.	.	.	.
3.167	0.3476	1.53	QV	.	.	.	.
3.250	0.3582	1.53	QV	.	.	.	.
3.333	0.3688	1.54	Q V	.	.	.	.

3.417	0.3794	1.55	Q V . . . .
3.500	0.3901	1.55	Q V . . . .
3.583	0.4008	1.56	Q V . . . .
3.667	0.4116	1.56	Q V . . . .
3.750	0.4224	1.57	Q V . . . .
3.833	0.4333	1.58	Q V . . . .
3.917	0.4442	1.58	Q V . . . .
4.000	0.4551	1.59	Q V . . . .
4.083	0.4661	1.60	Q V . . . .
4.167	0.4772	1.60	Q V . . . .
4.250	0.4883	1.61	Q V . . . .
4.333	0.4994	1.62	Q V . . . .
4.417	0.5106	1.62	Q V . . . .
4.500	0.5218	1.63	Q V . . . .
4.583	0.5331	1.64	Q V . . . .
4.667	0.5445	1.65	Q V . . . .
4.750	0.5559	1.65	Q V . . . .
4.833	0.5673	1.66	Q V . . . .
4.917	0.5788	1.67	Q V . . . .
5.000	0.5903	1.68	Q V . . . .
5.083	0.6019	1.68	Q V . . . .
5.167	0.6136	1.69	Q V . . . .
5.250	0.6253	1.70	Q V . . . .
5.333	0.6370	1.71	Q V . . . .
5.417	0.6489	1.72	Q V . . . .
5.500	0.6607	1.72	Q V . . . .
5.583	0.6727	1.73	Q V . . . .
5.667	0.6846	1.74	Q V . . . .
5.750	0.6967	1.75	Q V . . . .
5.833	0.7088	1.76	.Q V . . . .
5.917	0.7210	1.77	.Q V . . . .
6.000	0.7332	1.78	.Q V . . . .
6.083	0.7455	1.78	.Q V . . . .
6.167	0.7578	1.79	.Q V . . . .
6.250	0.7702	1.80	.Q V . . . .
6.333	0.7827	1.81	.Q V . . . .
6.417	0.7952	1.82	.Q V . . . .
6.500	0.8079	1.83	.Q V . . . .
6.583	0.8205	1.84	.Q V . . . .
6.667	0.8333	1.85	.Q V . . . .
6.750	0.8461	1.86	.Q V . . . .
6.833	0.8590	1.87	.Q V . . . .
6.917	0.8719	1.88	.Q V . . . .
7.000	0.8849	1.89	.Q V . . . .
7.083	0.8980	1.90	.Q V . . . .
7.167	0.9112	1.91	.Q V . . . .
7.250	0.9244	1.92	.Q V . . . .
7.333	0.9378	1.93	.Q V . . . .
7.417	0.9512	1.95	.Q V . . . .
7.500	0.9646	1.96	.Q V . . . .
7.583	0.9782	1.97	.Q V . . . .
7.667	0.9918	1.98	.Q V . . . .
7.750	1.0055	1.99	.Q V . . . .
7.833	1.0193	2.00	.Q V . . . .
7.917	1.0332	2.02	.Q V . . . .
8.000	1.0472	2.03	.Q V . . . .
8.083	1.0613	2.04	.Q V . . . .
8.167	1.0754	2.05	.Q V . . . .
8.250	1.0896	2.07	.Q V . . . .
8.333	1.1040	2.08	.Q V . . . .
8.417	1.1184	2.09	.Q V . . . .
8.500	1.1329	2.11	.Q V . . . .
8.583	1.1475	2.12	.Q V . . . .
8.667	1.1623	2.14	.Q V . . . .
8.750	1.1771	2.15	.Q V . . . .
8.833	1.1920	2.17	.Q V . . . .
8.917	1.2070	2.18	.Q V . . . .
9.000	1.2221	2.20	.Q V . . . .
9.083	1.2374	2.21	.Q V . . . .
9.167	1.2527	2.23	.Q V . . . .
9.250	1.2682	2.24	.Q V . . . .
9.333	1.2838	2.26	.Q V . . . .
9.417	1.2994	2.28	.Q V . . . .

9.500	1.3153	2.30	.Q V . . . .
9.583	1.3312	2.31	.Q V . . . .
9.667	1.3472	2.33	.Q V . . . .
9.750	1.3634	2.35	.Q V . . . .
9.833	1.3797	2.37	.Q V . . . .
9.917	1.3962	2.39	.Q V . . . .
10.000	1.4127	2.41	.Q V . . . .
10.083	1.4294	2.43	.Q V . . . .
10.167	1.4463	2.45	.Q V . . . .
10.250	1.4633	2.47	.Q V . . . .
10.333	1.4804	2.49	.Q V . . . .
10.417	1.4977	2.51	.Q V . . . .
10.500	1.5152	2.53	.Q V . . . .
10.583	1.5328	2.56	.Q V . . . .
10.667	1.5505	2.58	.Q V . . . .
10.750	1.5685	2.60	.Q V . . . .
10.833	1.5866	2.63	.Q V . . . .
10.917	1.6048	2.65	.Q V . . . .
11.000	1.6233	2.68	.Q V . . . .
11.083	1.6419	2.70	.Q V. . . .
11.167	1.6607	2.73	.Q V. . . .
11.250	1.6797	2.76	.Q V. . . .
11.333	1.6989	2.79	.Q V. . . .
11.417	1.7183	2.82	.Q V. . . .
11.500	1.7379	2.85	.Q V. . . .
11.583	1.7578	2.88	.Q V. . . .
11.667	1.7778	2.91	.Q V. . . .
11.750	1.7981	2.94	.Q V. . . .
11.833	1.8186	2.98	.Q V . . .
11.917	1.8394	3.01	.Q V . . .
12.000	1.8604	3.05	.Q V . . .
12.083	1.8816	3.08	.Q V . . .
12.167	1.9029	3.10	.Q V . . .
12.250	1.9244	3.11	.Q V . . .
12.333	1.9460	3.14	.Q V . . .
12.417	1.9679	3.18	.Q V . . .
12.500	1.9901	3.22	.Q V . . .
12.583	2.0125	3.26	.Q .V . . .
12.667	2.0353	3.31	.Q .V . . .
12.750	2.0584	3.35	.Q .V . . .
12.833	2.0819	3.40	.Q .V . . .
12.917	2.1056	3.45	.Q .V . . .
13.000	2.1298	3.51	. Q .V . . .
13.083	2.1544	3.57	. Q .V . . .
13.167	2.1793	3.63	. Q . V . . .
13.250	2.2047	3.69	. Q . V . . .
13.333	2.2306	3.75	. Q . V . . .
13.417	2.2569	3.82	. Q . V . . .
13.500	2.2837	3.89	. Q . V . . .
13.583	2.3110	3.97	. Q . V . . .
13.667	2.3388	4.05	. Q . V . . .
13.750	2.3673	4.13	. Q . V . . .
13.833	2.3963	4.22	. Q . V . . .
13.917	2.4260	4.31	. Q . V . . .
14.000	2.4563	4.41	. Q . V . . .
14.083	2.4872	4.49	. Q . V . . .
14.167	2.5177	4.43	. Q . V . . .
14.250	2.5478	4.37	. Q . V . . .
14.333	2.5783	4.42	. Q . V . . .
14.417	2.6093	4.50	. Q . V . . .
14.500	2.6410	4.61	. Q . V . . .
14.583	2.6737	4.74	. Q . V . . .
14.667	2.7074	4.89	. Q . V . . .
14.750	2.7422	5.06	. Q . V . . .
14.833	2.7784	5.25	. Q . V . . .
14.917	2.8160	5.45	. Q . V . . .
15.000	2.8552	5.69	. Q . V . . .
15.083	2.8962	5.95	. Q . V . . .
15.167	2.9393	6.26	. Q . V . . .
15.250	2.9847	6.59	. Q . V . . .
15.333	3.0329	7.00	. Q . V . . .
15.417	3.0841	7.44	. Q . V . . .
15.500	3.1391	7.98	. Q . V . . .

15.583	3.1983	8.60	. Q . V . . .
15.667	3.2635	9.46	. Q . V . . .
15.750	3.3388	10.95	. Q . V . . .
15.833	3.4429	15.11	. Q . V . . .
15.917	3.5819	20.18	. .Q V. . .
16.000	3.7620	26.16	. . Q V . .
16.083	4.0182	37.19	. . .QV . .
16.167	4.4351	60.54	. . . V . Q .
16.250	4.8349	58.04	. . . V . Q .
16.333	5.0892	36.94	. . .Q V . .
16.417	5.2667	25.77	. . Q . V. .
16.500	5.4032	19.82	. .Q . V. .
16.583	5.5120	15.79	. Q. . V .
16.667	5.6020	13.08	. Q . . V .
16.750	5.6780	11.03	. Q . . .V .
16.833	5.7429	9.43	. Q . . .V .
16.917	5.7987	8.10	. Q . . .V .
17.000	5.8471	7.03	. Q . . . V .
17.083	5.8915	6.45	. Q . . . V .
17.167	5.9330	6.03	. Q . . . V .
17.250	5.9709	5.51	. Q . . . V .
17.333	6.0055	5.02	. Q . . . V .
17.417	6.0374	4.63	. Q . . . V .
17.500	6.0674	4.35	. Q . . . V .
17.583	6.0960	4.16	. Q . . . V .
17.667	6.1236	3.99	. Q . . . V .
17.750	6.1500	3.85	. Q . . . V .
17.833	6.1756	3.71	. Q . . . V .
17.917	6.2003	3.59	. Q . . . V .
18.000	6.2243	3.48	.Q . . . V .
18.083	6.2475	3.38	.Q . . . V .
18.167	6.2703	3.30	.Q . . . V .
18.250	6.2926	3.24	.Q . . . V .
18.333	6.3144	3.16	.Q . . . V .
18.417	6.3356	3.09	.Q . . . V .
18.500	6.3564	3.02	.Q . . . V .
18.583	6.3767	2.95	.Q . . . V .
18.667	6.3966	2.89	.Q . . . V .
18.750	6.4161	2.83	.Q . . . V .
18.833	6.4351	2.77	.Q . . . V .
18.917	6.4538	2.71	.Q . . . V .
19.000	6.4721	2.66	.Q . . . V .
19.083	6.4901	2.61	.Q . . . V .
19.167	6.5077	2.56	.Q . . . V .
19.250	6.5251	2.52	.Q . . . V .
19.333	6.5421	2.47	.Q . . . V .
19.417	6.5589	2.43	.Q . . . V .
19.500	6.5754	2.39	.Q . . . V .
19.583	6.5916	2.35	.Q . . . V .
19.667	6.6075	2.32	.Q . . . V .
19.750	6.6232	2.28	.Q . . . V .
19.833	6.6387	2.25	.Q . . . V .
19.917	6.6540	2.22	.Q . . . V .
20.000	6.6690	2.19	.Q . . . V .
20.083	6.6839	2.15	.Q . . . V .
20.167	6.6985	2.13	.Q . . . V .
20.250	6.7130	2.10	.Q . . . V .
20.333	6.7272	2.07	.Q . . . V .
20.417	6.7413	2.04	.Q . . . V .
20.500	6.7552	2.02	.Q . . . V .
20.583	6.7690	1.99	.Q . . . V .
20.667	6.7825	1.97	.Q . . . V .
20.750	6.7959	1.95	.Q . . . V .
20.833	6.8092	1.93	.Q . . . V .
20.917	6.8223	1.90	.Q . . . V .
21.000	6.8353	1.88	.Q . . . V .
21.083	6.8481	1.86	.Q . . . V .
21.167	6.8608	1.84	.Q . . . V .
21.250	6.8733	1.82	.Q . . . V .
21.333	6.8858	1.80	.Q . . . V .
21.417	6.8981	1.79	.Q . . . V .
21.500	6.9102	1.77	.Q . . . V .
21.583	6.9223	1.75	.Q . . . V .

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  21.667      6.9342      1.73  Q         .         .         .       V .
  21.750      6.9461      1.72  Q         .         .         .       V .
  21.833      6.9578      1.70  Q         .         .         .       V .
  21.917      6.9694      1.69  Q         .         .         .       V .
  22.000      6.9809      1.67  Q         .         .         .       V .
  22.083      6.9923      1.65  Q         .         .         .       V .
  22.167      7.0036      1.64  Q         .         .         .       V .
  22.250      7.0148      1.63  Q         .         .         .       V .
  22.333      7.0259      1.61  Q         .         .         .       V .
  22.417      7.0369      1.60  Q         .         .         .       V .
  22.500      7.0478      1.58  Q         .         .         .       V .
  22.583      7.0586      1.57  Q         .         .         .       V .
  22.667      7.0693      1.56  Q         .         .         .       V .
  22.750      7.0800      1.55  Q         .         .         .        V.
  22.833      7.0906      1.53  Q         .         .         .        V.
  22.917      7.1010      1.52  Q         .         .         .        V.
  23.000      7.1114      1.51  Q         .         .         .        V.
  23.083      7.1218      1.50  Q         .         .         .        V.
  23.167      7.1320      1.49  Q         .         .         .        V.
  23.250      7.1422      1.48  Q         .         .         .        V.
  23.333      7.1523      1.47  Q         .         .         .        V.
  23.417      7.1623      1.45  Q         .         .         .        V.
  23.500      7.1722      1.44  Q         .         .         .        V.
  23.583      7.1821      1.43  Q         .         .         .        V.
  23.667      7.1919      1.42  Q         .         .         .        V.
  23.750      7.2017      1.41  Q         .         .         .        V.
  23.833      7.2113      1.40  Q         .         .         .        V.
  23.917      7.2209      1.39  Q         .         .         .        V.
  24.000      7.2305      1.39  Q         .         .         .        V.
  24.083      7.2396      1.32  Q         .         .         .        V.
  24.167      7.2459      0.92  Q         .         .         .        V.
  24.250      7.2495      0.52  Q         .         .         .        V.
  24.333      7.2518      0.34  Q         .         .         .        V.
  24.417      7.2535      0.24  Q         .         .         .        V.
  24.500      7.2547      0.17  Q         .         .         .        V.
  24.583      7.2556      0.13  Q         .         .         .        V.
  24.667      7.2562      0.09  Q         .         .         .        V.
  24.750      7.2566      0.06  Q         .         .         .        V.
  24.833      7.2569      0.04  Q         .         .         .        V.
  24.917      7.2571      0.03  Q         .         .         .        V.
  25.000      7.2573      0.02  Q         .         .         .        V.
  25.083      7.2574      0.01  Q         .         .         .        V.
  25.167      7.2575      0.01  Q         .         .         .        V.

****************************************************************************
  FLOW PROCESS FROM NODE   301.00 TO NODE   302.00 IS CODE = 3.1
----------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
============================================================================

                     INFLOW
                   (STREAM 1)
                        |
                        |
                        V                 __effective depth
                  -----------             |   (and volume)
                 |           |    |    |
                 |           |    |....V........
                 | detention |<-->|           outflow
                 |   basin   |    |.........______
                  -----------     |    ^    |  \
                        |         |  dead   |   basin outlet
                        V         | storage |
                     OUTFLOW       ---------
                   (STREAM 1)


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

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	2.40	0.01	2.130
3	2.89	40.30	2.610
4	3.39	43.60	3.130
5	3.89	46.70	3.670

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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	0.06	0.00	0.00	0.0	0.000
0.167	0.000	0.45	0.00	0.00	0.0	0.003
0.250	0.000	0.85	0.00	0.01	0.0	0.009
0.333	0.000	1.02	0.00	0.02	0.0	0.016
0.417	0.000	1.12	0.00	0.03	0.0	0.024
0.500	0.000	1.20	0.00	0.04	0.0	0.032
0.583	0.000	1.25	0.00	0.05	0.0	0.041
0.667	0.000	1.28	0.00	0.06	0.0	0.050
0.750	0.000	1.31	0.00	0.07	0.0	0.059
0.833	0.000	1.34	0.00	0.08	0.0	0.068
0.917	0.000	1.35	0.00	0.09	0.0	0.077
1.000	0.000	1.37	0.00	0.10	0.0	0.087
1.083	0.000	1.38	0.00	0.11	0.0	0.096
1.167	0.000	1.39	0.00	0.12	0.0	0.106
1.250	0.000	1.40	0.00	0.13	0.0	0.115
1.333	0.000	1.41	0.00	0.14	0.0	0.125
1.417	0.000	1.41	0.00	0.15	0.0	0.135
1.500	0.000	1.42	0.00	0.16	0.0	0.145
1.583	0.000	1.42	0.00	0.17	0.0	0.154
1.667	0.000	1.43	0.00	0.19	0.0	0.164
1.750	0.000	1.43	0.00	0.20	0.0	0.174
1.833	0.000	1.44	0.00	0.21	0.0	0.184
1.917	0.000	1.44	0.00	0.22	0.0	0.194
2.000	0.000	1.45	0.00	0.23	0.0	0.204
2.083	0.000	1.45	0.00	0.24	0.0	0.214
2.167	0.000	1.46	0.00	0.25	0.0	0.224
2.250	0.000	1.46	0.00	0.26	0.0	0.234
2.333	0.000	1.47	0.00	0.28	0.0	0.244
2.417	0.000	1.48	0.00	0.29	0.0	0.254
2.500	0.000	1.48	0.00	0.30	0.0	0.264
2.583	0.000	1.49	0.00	0.31	0.0	0.275
2.667	0.000	1.49	0.00	0.32	0.0	0.285
2.750	0.000	1.50	0.00	0.33	0.0	0.295
2.833	0.000	1.50	0.00	0.34	0.0	0.306
2.917	0.000	1.51	0.00	0.36	0.0	0.316
3.000	0.000	1.52	0.00	0.37	0.0	0.326
3.083	0.000	1.52	0.00	0.38	0.0	0.337
3.167	0.000	1.53	0.00	0.39	0.0	0.347
3.250	0.000	1.53	0.00	0.40	0.0	0.358
3.333	0.000	1.54	0.00	0.42	0.0	0.369
3.417	0.000	1.55	0.00	0.43	0.0	0.379
3.500	0.000	1.55	0.00	0.44	0.0	0.390
3.583	0.000	1.56	0.00	0.45	0.0	0.401
3.667	0.000	1.56	0.00	0.46	0.0	0.411
3.750	0.000	1.57	0.00	0.48	0.0	0.422
3.833	0.000	1.58	0.00	0.49	0.0	0.433
3.917	0.000	1.58	0.00	0.50	0.0	0.444
4.000	0.000	1.59	0.00	0.51	0.0	0.455

4.083	0.000	1.60	0.00	0.52	0.0	0.466
4.167	0.000	1.60	0.00	0.54	0.0	0.477
4.250	0.000	1.61	0.00	0.55	0.0	0.488
4.333	0.000	1.62	0.00	0.56	0.0	0.499
4.417	0.000	1.62	0.00	0.57	0.0	0.510
4.500	0.000	1.63	0.00	0.59	0.0	0.521
4.583	0.000	1.64	0.00	0.60	0.0	0.533
4.667	0.000	1.65	0.00	0.61	0.0	0.544
4.750	0.000	1.65	0.00	0.63	0.0	0.555
4.833	0.000	1.66	0.00	0.64	0.0	0.567
4.917	0.000	1.67	0.00	0.65	0.0	0.578
5.000	0.000	1.68	0.00	0.66	0.0	0.590
5.083	0.000	1.68	0.00	0.68	0.0	0.601
5.167	0.000	1.69	0.00	0.69	0.0	0.613
5.250	0.000	1.70	0.00	0.70	0.0	0.625
5.333	0.000	1.71	0.00	0.72	0.0	0.636
5.417	0.000	1.72	0.00	0.73	0.0	0.648
5.500	0.000	1.72	0.00	0.74	0.0	0.660
5.583	0.000	1.73	0.00	0.76	0.0	0.672
5.667	0.000	1.74	0.00	0.77	0.0	0.684
5.750	0.000	1.75	0.00	0.78	0.0	0.696
5.833	0.000	1.76	0.00	0.80	0.0	0.708
5.917	0.000	1.77	0.00	0.81	0.0	0.720
6.000	0.000	1.78	0.00	0.83	0.0	0.732
6.083	0.000	1.78	0.00	0.84	0.0	0.745
6.167	0.000	1.79	0.00	0.85	0.0	0.757
6.250	0.000	1.80	0.00	0.87	0.0	0.769
6.333	0.000	1.81	0.00	0.88	0.0	0.782
6.417	0.000	1.82	0.00	0.89	0.0	0.794
6.500	0.000	1.83	0.00	0.91	0.0	0.807
6.583	0.000	1.84	0.00	0.92	0.0	0.819
6.667	0.000	1.85	0.00	0.94	0.0	0.832
6.750	0.000	1.86	0.00	0.95	0.0	0.845
6.833	0.000	1.87	0.00	0.97	0.0	0.858
6.917	0.000	1.88	0.00	0.98	0.0	0.871
7.000	0.000	1.89	0.00	1.00	0.0	0.884
7.083	0.000	1.90	0.00	1.01	0.0	0.897
7.167	0.000	1.91	0.00	1.03	0.0	0.910
7.250	0.000	1.92	0.00	1.04	0.0	0.923
7.333	0.000	1.93	0.00	1.06	0.0	0.936
7.417	0.000	1.95	0.00	1.07	0.0	0.950
7.500	0.000	1.96	0.00	1.09	0.0	0.963
7.583	0.000	1.97	0.00	1.10	0.0	0.977
7.667	0.000	1.98	0.00	1.12	0.0	0.990
7.750	0.000	1.99	0.00	1.13	0.0	1.004
7.833	0.000	2.00	0.00	1.15	0.0	1.018
7.917	0.000	2.02	0.00	1.16	0.0	1.032
8.000	0.000	2.03	0.00	1.18	0.0	1.046
8.083	0.000	2.04	0.00	1.19	0.0	1.060
8.167	0.000	2.05	0.00	1.21	0.0	1.074
8.250	0.000	2.07	0.00	1.23	0.0	1.088
8.333	0.000	2.08	0.00	1.24	0.0	1.102
8.417	0.000	2.09	0.00	1.26	0.0	1.117
8.500	0.000	2.11	0.00	1.27	0.0	1.131
8.583	0.000	2.12	0.00	1.29	0.0	1.146
8.667	0.000	2.14	0.00	1.31	0.0	1.160
8.750	0.000	2.15	0.00	1.32	0.0	1.175
8.833	0.000	2.17	0.00	1.34	0.0	1.190
8.917	0.000	2.18	0.00	1.36	0.0	1.205
9.000	0.000	2.20	0.00	1.37	0.0	1.220
9.083	0.000	2.21	0.00	1.39	0.0	1.235
9.167	0.000	2.23	0.00	1.41	0.0	1.251
9.250	0.000	2.24	0.00	1.43	0.0	1.266
9.333	0.000	2.26	0.00	1.44	0.0	1.281
9.417	0.000	2.28	0.00	1.46	0.0	1.297
9.500	0.000	2.30	0.00	1.48	0.0	1.313
9.583	0.000	2.31	0.00	1.50	0.0	1.329
9.667	0.000	2.33	0.00	1.52	0.0	1.345
9.750	0.000	2.35	0.00	1.53	0.0	1.361
9.833	0.000	2.37	0.00	1.55	0.0	1.377
9.917	0.000	2.39	0.00	1.57	0.0	1.394
10.000	0.000	2.41	0.00	1.59	0.0	1.410
10.083	0.000	2.43	0.00	1.61	0.0	1.427

10.167	0.000	2.45	0.00	1.63	0.0	1.444
10.250	0.000	2.47	0.00	1.65	0.0	1.460
10.333	0.000	2.49	0.00	1.66	0.0	1.478
10.417	0.000	2.51	0.00	1.68	0.0	1.495
10.500	0.000	2.53	0.00	1.70	0.0	1.512
10.583	0.000	2.56	0.00	1.72	0.0	1.530
10.667	0.000	2.58	0.00	1.74	0.0	1.547
10.750	0.000	2.60	0.00	1.76	0.0	1.565
10.833	0.000	2.63	0.00	1.78	0.0	1.583
10.917	0.000	2.65	0.00	1.80	0.0	1.602
11.000	0.000	2.68	0.00	1.83	0.0	1.620
11.083	0.000	2.70	0.00	1.85	0.0	1.639
11.167	0.000	2.73	0.00	1.87	0.0	1.657
11.250	0.000	2.76	0.00	1.89	0.0	1.676
11.333	0.000	2.79	0.00	1.91	0.0	1.695
11.417	0.000	2.82	0.00	1.93	0.0	1.715
11.500	0.000	2.85	0.00	1.95	0.0	1.734
11.583	0.000	2.88	0.00	1.98	0.0	1.754
11.667	0.000	2.91	0.00	2.00	0.0	1.774
11.750	0.000	2.94	0.00	2.02	0.0	1.794
11.833	0.000	2.98	0.00	2.04	0.0	1.815
11.917	0.000	3.01	0.00	2.07	0.0	1.835
12.000	0.000	3.05	0.00	2.09	0.0	1.856
12.083	0.000	3.08	0.00	2.12	0.0	1.877
12.167	0.000	3.10	0.00	2.14	0.0	1.899
12.250	0.000	3.11	0.00	2.16	0.0	1.920
12.333	0.000	3.14	0.00	2.19	0.0	1.942
12.417	0.000	3.18	0.00	2.21	0.0	1.964
12.500	0.000	3.22	0.00	2.24	0.0	1.986
12.583	0.000	3.26	0.00	2.26	0.0	2.008
12.667	0.000	3.31	0.00	2.29	0.0	2.031
12.750	0.000	3.35	0.00	2.31	0.0	2.054
12.833	0.000	3.40	0.00	2.34	0.0	2.077
12.917	0.000	3.45	0.00	2.37	0.0	2.101
13.000	0.000	3.51	0.00	2.39	0.0	2.125
13.083	0.000	3.57	0.00	2.42	0.6	2.145
13.167	0.000	3.63	0.00	2.43	1.8	2.158
13.250	0.000	3.69	0.00	2.44	2.6	2.165
13.333	0.000	3.75	0.00	2.44	3.1	2.169
13.417	0.000	3.82	0.00	2.44	3.4	2.172
13.500	0.000	3.89	0.00	2.44	3.6	2.174
13.583	0.000	3.97	0.00	2.45	3.8	2.175
13.667	0.000	4.05	0.00	2.45	3.9	2.177
13.750	0.000	4.13	0.00	2.45	4.0	2.178
13.833	0.000	4.22	0.00	2.45	4.1	2.179
13.917	0.000	4.31	0.00	2.45	4.2	2.180
14.000	0.000	4.41	0.00	2.45	4.2	2.181
14.083	0.000	4.49	0.00	2.45	4.3	2.182
14.167	0.000	4.43	0.00	2.45	4.4	2.182
14.250	0.000	4.37	0.00	2.45	4.4	2.182
14.333	0.000	4.42	0.00	2.45	4.4	2.182
14.417	0.000	4.50	0.00	2.45	4.4	2.183
14.500	0.000	4.61	0.00	2.45	4.5	2.184
14.583	0.000	4.74	0.00	2.46	4.6	2.185
14.667	0.000	4.89	0.00	2.46	4.7	2.186
14.750	0.000	5.06	0.00	2.46	4.8	2.188
14.833	0.000	5.25	0.00	2.46	5.0	2.190
14.917	0.000	5.45	0.00	2.46	5.1	2.192
15.000	0.000	5.69	0.00	2.47	5.3	2.195
15.083	0.000	5.95	0.00	2.47	5.6	2.197
15.167	0.000	6.26	0.00	2.47	5.8	2.201
15.250	0.000	6.59	0.00	2.48	6.1	2.204
15.333	0.000	7.00	0.00	2.48	6.4	2.208
15.417	0.000	7.44	0.00	2.48	6.8	2.213
15.500	0.000	7.98	0.00	2.49	7.2	2.218
15.583	0.000	8.60	0.00	2.50	7.7	2.225
15.667	0.000	9.46	0.00	2.50	8.3	2.233
15.750	0.000	10.95	0.00	2.52	9.1	2.245
15.833	0.000	15.11	0.00	2.55	10.9	2.274
15.917	0.000	20.18	0.00	2.59	13.9	2.317
16.000	0.000	26.16	0.00	2.65	18.1	2.373
16.083	0.000	37.19	0.00	2.74	24.2	2.463
16.167	0.000	60.54	0.00	2.92	34.2	2.644

16.250	0.000	58.04	0.00	3.04	40.9	2.762
16.333	0.000	36.94	0.00	3.01	41.2	2.733
16.417	0.000	25.77	0.00	2.91	40.8	2.630
16.500	0.000	19.82	0.00	2.79	36.4	2.516
16.583	0.000	15.79	0.00	2.70	28.7	2.427
16.667	0.000	13.08	0.00	2.64	22.3	2.364
16.750	0.000	11.03	0.00	2.59	17.7	2.318
16.833	0.000	9.43	0.00	2.56	14.3	2.284
16.917	0.000	8.10	0.00	2.53	11.8	2.258
17.000	0.000	7.03	0.00	2.51	9.9	2.238
17.083	0.000	6.45	0.00	2.50	8.5	2.224
17.167	0.000	6.03	0.00	2.49	7.5	2.214
17.250	0.000	5.51	0.00	2.48	6.7	2.206
17.333	0.000	5.02	0.00	2.47	6.1	2.199
17.417	0.000	4.63	0.00	2.46	5.5	2.192
17.500	0.000	4.35	0.00	2.46	5.1	2.188
17.583	0.000	4.16	0.00	2.46	4.7	2.184
17.667	0.000	3.99	0.00	2.45	4.4	2.181
17.750	0.000	3.85	0.00	2.45	4.2	2.179
17.833	0.000	3.71	0.00	2.45	4.0	2.177
17.917	0.000	3.59	0.00	2.45	3.8	2.175
18.000	0.000	3.48	0.00	2.44	3.7	2.173
18.083	0.000	3.38	0.00	2.44	3.6	2.172
18.167	0.000	3.30	0.00	2.44	3.5	2.171
18.250	0.000	3.24	0.00	2.44	3.4	2.170
18.333	0.000	3.16	0.00	2.44	3.3	2.169
18.417	0.000	3.09	0.00	2.44	3.2	2.168
18.500	0.000	3.02	0.00	2.44	3.1	2.167
18.583	0.000	2.95	0.00	2.44	3.1	2.166
18.667	0.000	2.89	0.00	2.44	3.0	2.165
18.750	0.000	2.83	0.00	2.44	2.9	2.164
18.833	0.000	2.77	0.00	2.43	2.9	2.164
18.917	0.000	2.71	0.00	2.43	2.8	2.163
19.000	0.000	2.66	0.00	2.43	2.8	2.162
19.083	0.000	2.61	0.00	2.43	2.7	2.162
19.167	0.000	2.56	0.00	2.43	2.7	2.161
19.250	0.000	2.52	0.00	2.43	2.6	2.161
19.333	0.000	2.47	0.00	2.43	2.6	2.160
19.417	0.000	2.43	0.00	2.43	2.5	2.159
19.500	0.000	2.39	0.00	2.43	2.5	2.159
19.583	0.000	2.35	0.00	2.43	2.4	2.159
19.667	0.000	2.32	0.00	2.43	2.4	2.158
19.750	0.000	2.28	0.00	2.43	2.3	2.158
19.833	0.000	2.25	0.00	2.43	2.3	2.157
19.917	0.000	2.22	0.00	2.43	2.3	2.157
20.000	0.000	2.19	0.00	2.43	2.2	2.156
20.083	0.000	2.15	0.00	2.43	2.2	2.156
20.167	0.000	2.13	0.00	2.43	2.2	2.156
20.250	0.000	2.10	0.00	2.43	2.1	2.155
20.333	0.000	2.07	0.00	2.43	2.1	2.155
20.417	0.000	2.04	0.00	2.43	2.1	2.155
20.500	0.000	2.02	0.00	2.42	2.1	2.154
20.583	0.000	1.99	0.00	2.42	2.0	2.154
20.667	0.000	1.97	0.00	2.42	2.0	2.154
20.750	0.000	1.95	0.00	2.42	2.0	2.153
20.833	0.000	1.93	0.00	2.42	2.0	2.153
20.917	0.000	1.90	0.00	2.42	1.9	2.153
21.000	0.000	1.88	0.00	2.42	1.9	2.153
21.083	0.000	1.86	0.00	2.42	1.9	2.152
21.167	0.000	1.84	0.00	2.42	1.9	2.152
21.250	0.000	1.82	0.00	2.42	1.9	2.152
21.333	0.000	1.80	0.00	2.42	1.8	2.152
21.417	0.000	1.79	0.00	2.42	1.8	2.151
21.500	0.000	1.77	0.00	2.42	1.8	2.151
21.583	0.000	1.75	0.00	2.42	1.8	2.151
21.667	0.000	1.73	0.00	2.42	1.8	2.151
21.750	0.000	1.72	0.00	2.42	1.7	2.151
21.833	0.000	1.70	0.00	2.42	1.7	2.150
21.917	0.000	1.69	0.00	2.42	1.7	2.150
22.000	0.000	1.67	0.00	2.42	1.7	2.150
22.083	0.000	1.65	0.00	2.42	1.7	2.150
22.167	0.000	1.64	0.00	2.42	1.7	2.150
22.250	0.000	1.63	0.00	2.42	1.7	2.149

PEAK DISCHARGE

22.333	0.000	1.61	0.00	2.42	1.6	2.149
22.417	0.000	1.60	0.00	2.42	1.6	2.149
22.500	0.000	1.58	0.00	2.42	1.6	2.149
22.583	0.000	1.57	0.00	2.42	1.6	2.149
22.667	0.000	1.56	0.00	2.42	1.6	2.149
22.750	0.000	1.55	0.00	2.42	1.6	2.148
22.833	0.000	1.53	0.00	2.42	1.6	2.148
22.917	0.000	1.52	0.00	2.42	1.5	2.148
23.000	0.000	1.51	0.00	2.42	1.5	2.148
23.083	0.000	1.50	0.00	2.42	1.5	2.148
23.167	0.000	1.49	0.00	2.42	1.5	2.148
23.250	0.000	1.48	0.00	2.42	1.5	2.148
23.333	0.000	1.47	0.00	2.42	1.5	2.147
23.417	0.000	1.45	0.00	2.42	1.5	2.147
23.500	0.000	1.44	0.00	2.42	1.5	2.147
23.583	0.000	1.43	0.00	2.42	1.5	2.147
23.667	0.000	1.42	0.00	2.42	1.4	2.147
23.750	0.000	1.41	0.00	2.42	1.4	2.147
23.833	0.000	1.40	0.00	2.42	1.4	2.147
23.917	0.000	1.39	0.00	2.42	1.4	2.147

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 7.257 AF
BASIN STORAGE = 1.504 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 5.753 AF
LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

JOB #4099
BASIN #4 DETENTION VOLUME

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)	Discharge (cfs)	
2975.67	0.00	59,843					
			20,032	20,032	0.46	0.0	
2976.00	0.33	61,563					
			31,440	51,471	1.18	0.0	
2976.50	0.83	64,195					
			32,763	84,234	1.93	0.0	
2977.00	1.33	66,857					
			34,102	118,336	2.72	0.0	
2977.50	1.83	69,551					
			35,457	153,793	3.53	0.0	
2978.00	2.33	72,277					
			36,827	190,621	4.38	0.0	
2978.50	2.83	75,032					
			38,212	228,833	5.25	0.0	
2979.00	3.33	77,816					
			21,112	249,944	5.74	0.0	
10-YR HCOC → 2979.37	3.70	36,301					
			7,601	257,545	5.91	16.7	
2979.50	3.83	80,630					
			41,026	298,571	6.85	17.7	
2980.00	4.33	83,474					
			42,455	341,026	7.83	18.7	
2980.50	4.83	86,347					
			43,900	384,926	8.84	19.7	V=9.18 ac ft D=5.49' 100YR Q= 20.0 cfs
2981.00	5.33	89,251					
DET. 2981.49			45,360	430,285	9.88	20.6	
2981.50	5.83	92,187					
			46,835	477,120	10.95	21.4	
2982.00	6.33	95,152					
			48,325	525,444	12.06	22.3	
2982.50	6.83	98,146					
			49,829	575,274	13.21	23.1	
2983.00	7.33	101,171					
			51,346	626,619	14.39	23.8	
2983.50	7.83	104,211					

18" RISER

Calculations - Orifice Equation for 18" riser with an a calculated opening of 1.77 ft^2

$$Q = C \times A \times \sqrt{64.4 \times H}$$

$$Q = 0.6 \times 1.77 \sqrt{64.4 \times 5.49}$$

$$Q = 20.0 \text{ cfs}$$

A = Area Opening (1.77)
H = Height at 2981.49 (5.49 ft.)

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****************************************************************************

              F L O O D    R O U T I N G    A N A L Y S I S
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                          Analysis prepared by:

                           THIENES ENGINEERING
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 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB NO. 4099                                                      *
* DETENTION BASIN #4                                                    *
* HYDROGRAPH                                                            *
 ************************************************************************

  FILE NAME: C:\XDRIVE\4099\DETB4.DAT
  TIME/DATE OF STUDY: 09:22 08/30/2024


****************************************************************************
  FLOW PROCESS FROM NODE   100.00 TO NODE   101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      60.690 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.160 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.
         DESERT(UNDEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.057
         LOW LOSS FRACTION = 0.138
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.35
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.84
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.05
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.50
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  1.94
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  3.29

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.997
          30-MINUTE FACTOR = 0.997
           1-HOUR FACTOR = 0.997
           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 =  52.083


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 4.251                 31.199
        2                32.932                210.512
```

3	62.363	216.017
4	75.130	93.704
5	82.536	54.358
6	87.554	36.830
7	90.936	24.823
8	93.457	18.501
9	95.325	13.714
10	96.731	10.320
11	97.703	7.136
12	98.302	4.390
13	98.912	4.484
14	99.472	4.108
15	99.789	2.325
16	99.947	1.162
17	100.000	0.387

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.8459
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 14.7836

↑

==========

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.	50.0	100.0	150.0	200.0
0.083	0.0008	0.12	Q	.	.	.	.
0.167	0.0071	0.91	Q	.	.	.	.
0.250	0.0189	1.72	Q	.	.	.	.
0.333	0.0332	2.08	Q	.	.	.	.
0.417	0.0490	2.29	Q	.	.	.	.
0.500	0.0658	2.44	Q	.	.	.	.
0.583	0.0833	2.54	Q	.	.	.	.
0.667	0.1013	2.61	Q	.	.	.	.
0.750	0.1197	2.67	Q	.	.	.	.
0.833	0.1384	2.72	Q	.	.	.	.
0.917	0.1574	2.76	Q	.	.	.	.
1.000	0.1766	2.78	Q	.	.	.	.
1.083	0.1960	2.81	Q	.	.	.	.
1.167	0.2155	2.84	Q	.	.	.	.
1.250	0.2351	2.85	Q	.	.	.	.
1.333	0.2549	2.87	Q	.	.	.	.
1.417	0.2747	2.88	Q	.	.	.	.
1.500	0.2946	2.89	Q	.	.	.	.
1.583	0.3146	2.90	Q	.	.	.	.
1.667	0.3346	2.91	Q	.	.	.	.
1.750	0.3548	2.92	Q	.	.	.	.
1.833	0.3749	2.93	QV	.	.	.	.
1.917	0.3952	2.94	QV	.	.	.	.
2.000	0.4155	2.95	QV	.	.	.	.
2.083	0.4359	2.96	QV	.	.	.	.
2.167	0.4564	2.97	QV	.	.	.	.
2.250	0.4769	2.98	QV	.	.	.	.
2.333	0.4976	3.00	QV	.	.	.	.
2.417	0.5183	3.01	QV	.	.	.	.
2.500	0.5391	3.02	QV	.	.	.	.
2.583	0.5599	3.03	QV	.	.	.	.
2.667	0.5809	3.04	QV	.	.	.	.
2.750	0.6019	3.05	QV	.	.	.	.
2.833	0.6230	3.06	QV	.	.	.	.
2.917	0.6441	3.08	QV	.	.	.	.
3.000	0.6654	3.09	QV	.	.	.	.
3.083	0.6868	3.10	QV	.	.	.	.
3.167	0.7082	3.11	QV	.	.	.	.
3.250	0.7297	3.12	QV	.	.	.	.
3.333	0.7513	3.14	Q V	.	.	.	.

3.417	0.7730	3.15	Q	V	.	.	.	.
3.500	0.7947	3.16	Q	V	.	.	.	.
3.583	0.8166	3.17	Q	V	.	.	.	.
3.667	0.8386	3.19	Q	V	.	.	.	.
3.750	0.8606	3.20	Q	V	.	.	.	.
3.833	0.8827	3.21	Q	V	.	.	.	.
3.917	0.9049	3.23	Q	V	.	.	.	.
4.000	0.9273	3.24	Q	V	.	.	.	.
4.083	0.9497	3.25	Q	V	.	.	.	.
4.167	0.9722	3.27	Q	V	.	.	.	.
4.250	0.9948	3.28	Q	V	.	.	.	.
4.333	1.0175	3.30	Q	V	.	.	.	.
4.417	1.0403	3.31	Q	V	.	.	.	.
4.500	1.0632	3.32	Q	V	.	.	.	.
4.583	1.0862	3.34	Q	V	.	.	.	.
4.667	1.1093	3.35	Q	V	.	.	.	.
4.750	1.1325	3.37	Q	V	.	.	.	.
4.833	1.1558	3.38	Q	V	.	.	.	.
4.917	1.1792	3.40	Q	V	.	.	.	.
5.000	1.2027	3.41	Q	V	.	.	.	.
5.083	1.2263	3.43	Q	V	.	.	.	.
5.167	1.2500	3.45	Q	V	.	.	.	.
5.250	1.2739	3.46	Q	V	.	.	.	.
5.333	1.2978	3.48	Q	V	.	.	.	.
5.417	1.3219	3.49	Q	V	.	.	.	.
5.500	1.3461	3.51	Q	V	.	.	.	.
5.583	1.3704	3.53	Q	V	.	.	.	.
5.667	1.3948	3.55	Q	V	.	.	.	.
5.750	1.4194	3.56	Q	V	.	.	.	.
5.833	1.4440	3.58	Q	V	.	.	.	.
5.917	1.4688	3.60	Q	V	.	.	.	.
6.000	1.4937	3.62	Q	V	.	.	.	.
6.083	1.5187	3.63	Q	V	.	.	.	.
6.167	1.5439	3.65	Q	V	.	.	.	.
6.250	1.5692	3.67	Q	V	.	.	.	.
6.333	1.5946	3.69	Q	V	.	.	.	.
6.417	1.6201	3.71	Q	V	.	.	.	.
6.500	1.6458	3.73	Q	V	.	.	.	.
6.583	1.6716	3.75	Q	V	.	.	.	.
6.667	1.6976	3.77	Q	V	.	.	.	.
6.750	1.7237	3.79	Q	V	.	.	.	.
6.833	1.7499	3.81	Q	V	.	.	.	.
6.917	1.7763	3.83	Q	V	.	.	.	.
7.000	1.8029	3.85	Q	V	.	.	.	.
7.083	1.8295	3.87	Q	V	.	.	.	.
7.167	1.8564	3.90	Q	V	.	.	.	.
7.250	1.8833	3.92	Q	V	.	.	.	.
7.333	1.9105	3.94	Q	V	.	.	.	.
7.417	1.9378	3.96	Q	V	.	.	.	.
7.500	1.9652	3.99	Q	V	.	.	.	.
7.583	1.9928	4.01	Q	V	.	.	.	.
7.667	2.0206	4.03	Q	V	.	.	.	.
7.750	2.0486	4.06	Q	V	.	.	.	.
7.833	2.0767	4.08	Q	V	.	.	.	.
7.917	2.1050	4.11	Q	V	.	.	.	.
8.000	2.1334	4.13	Q	V	.	.	.	.
8.083	2.1621	4.16	Q	V	.	.	.	.
8.167	2.1909	4.19	Q	V	.	.	.	.
8.250	2.2199	4.21	Q	V	.	.	.	.
8.333	2.2491	4.24	Q	V	.	.	.	.
8.417	2.2785	4.27	Q	V	.	.	.	.
8.500	2.3081	4.30	Q	V	.	.	.	.
8.583	2.3379	4.32	Q	V	.	.	.	.
8.667	2.3678	4.35	Q	V	.	.	.	.
8.750	2.3980	4.38	Q	V	.	.	.	.
8.833	2.4284	4.41	Q	V	.	.	.	.
8.917	2.4590	4.44	Q	V	.	.	.	.
9.000	2.4898	4.48	Q	V	.	.	.	.
9.083	2.5209	4.51	Q	V	.	.	.	.
9.167	2.5521	4.54	Q	V	.	.	.	.
9.250	2.5836	4.57	Q	V	.	.	.	.
9.333	2.6154	4.61	Q	V	.	.	.	.
9.417	2.6473	4.64	Q	V	.	.	.	.

9.500	2.6795	4.68	Q	V	.	.	.	.
9.583	2.7120	4.71	Q	V	.	.	.	.
9.667	2.7447	4.75	Q	V	.	.	.	.
9.750	2.7776	4.79	Q	V	.	.	.	.
9.833	2.8109	4.82	Q	V	.	.	.	.
9.917	2.8444	4.86	Q	V	.	.	.	.
10.000	2.8781	4.90	Q	V	.	.	.	.
10.083	2.9122	4.94	Q	V	.	.	.	.
10.167	2.9465	4.98	Q	V	.	.	.	.
10.250	2.9811	5.03	.Q	V	.	.	.	.
10.333	3.0160	5.07	.Q	V	.	.	.	.
10.417	3.0513	5.11	.Q	V	.	.	.	.
10.500	3.0868	5.16	.Q	V	.	.	.	.
10.583	3.1227	5.21	.Q	V	.	.	.	.
10.667	3.1588	5.25	.Q	V	.	.	.	.
10.750	3.1954	5.30	.Q	V	.	.	.	.
10.833	3.2322	5.35	.Q	V	.	.	.	.
10.917	3.2694	5.40	.Q	V	.	.	.	.
11.000	3.3070	5.46	.Q	V	.	.	.	.
11.083	3.3450	5.51	.Q	V	.	.	.	.
11.167	3.3833	5.57	.Q	V	.	.	.	.
11.250	3.4220	5.62	.Q	V	.	.	.	.
11.333	3.4612	5.68	.Q	V	.	.	.	.
11.417	3.5007	5.74	.Q	V	.	.	.	.
11.500	3.5407	5.80	.Q	V	.	.	.	.
11.583	3.5810	5.87	.Q	V	.	.	.	.
11.667	3.6219	5.93	.Q	V	.	.	.	.
11.750	3.6632	6.00	.Q	V	.	.	.	.
11.833	3.7050	6.07	.Q	V	.	.	.	.
11.917	3.7473	6.14	.Q	V	.	.	.	.
12.000	3.7900	6.21	.Q	V	.	.	.	.
12.083	3.8333	6.28	.Q	V	.	.	.	.
12.167	3.8768	6.31	.Q	V	.	.	.	.
12.250	3.9204	6.34	.Q	V	.	.	.	.
12.333	3.9646	6.41	.Q	V	.	.	.	.
12.417	4.0092	6.48	.Q	V	.	.	.	.
12.500	4.0544	6.56	.Q	V	.	.	.	.
12.583	4.1001	6.65	.Q	.V	.	.	.	.
12.667	4.1465	6.74	.Q	.V	.	.	.	.
12.750	4.1936	6.83	.Q	.V	.	.	.	.
12.833	4.2414	6.94	.Q	.V	.	.	.	.
12.917	4.2898	7.04	.Q	.V	.	.	.	.
13.000	4.3391	7.15	.Q	.V	.	.	.	.
13.083	4.3891	7.27	.Q	.V	.	.	.	.
13.167	4.4400	7.39	.Q	. V	.	.	.	.
13.250	4.4917	7.51	.Q	. V	.	.	.	.
13.333	4.5444	7.65	.Q	. V	.	.	.	.
13.417	4.5980	7.78	.Q	. V	.	.	.	.
13.500	4.6526	7.93	.Q	. V	.	.	.	.
13.583	4.7083	8.08	.Q	. V	.	.	.	.
13.667	4.7651	8.24	.Q	. V	.	.	.	.
13.750	4.8230	8.41	.Q	. V	.	.	.	.
13.833	4.8822	8.59	.Q	. V	.	.	.	.
13.917	4.9426	8.78	.Q	. V	.	.	.	.
14.000	5.0045	8.98	.Q	. V	.	.	.	.
14.083	5.0675	9.14	.Q	. V	.	.	.	.
14.167	5.1297	9.03	.Q	. V	.	.	.	.
14.250	5.1911	8.92	.Q	. V	.	.	.	.
14.333	5.2532	9.02	.Q	. V	.	.	.	.
14.417	5.3165	9.19	.Q	. V	.	.	.	.
14.500	5.3814	9.42	.Q	. V	.	.	.	.
14.583	5.4482	9.69	.Q	. V	.	.	.	.
14.667	5.5170	10.00	.Q	. V	.	.	.	.
14.750	5.5882	10.33	. Q	. V	.	.	.	.
14.833	5.6620	10.72	. Q	. V	.	.	.	.
14.917	5.7387	11.14	. Q	. V	.	.	.	.
15.000	5.8188	11.63	. Q	. V	.	.	.	.
15.083	5.9026	12.16	. Q	. V	.	.	.	.
15.167	5.9906	12.78	. Q	. V	.	.	.	.
15.250	6.0833	13.46	. Q	. V	.	.	.	.
15.333	6.1817	14.29	. Q	. V	.	.	.	.
15.417	6.2864	15.20	. Q	. V	.	.	.	.
15.500	6.3984	16.26	. Q	. V	.	.	.	.

15.583	6.5190	17.52	. Q . V . . .
15.667	6.6517	19.26	. Q . V . . .
15.750	6.8051	22.27	. Q . V . . .
15.833	7.0169	30.75	. Q . V . . .
15.917	7.2995	41.05	. Q . V. . .
16.000	7.6660	53.21	. Q V . .
16.083	8.1871	75.67	. Q . V . .
16.167	9.0353	123.16	. . Q . .
16.250	9.8486	118.08	. . Q V . .
16.333	10.3661	75.14	. Q . V . .
16.417	10.7271	52.42	. Q . V. .
16.500	11.0050	40.34	. Q . . V. .
16.583	11.2264	32.16	. Q . . V .
16.667	11.4100	26.65	. Q . . V .
16.750	11.5647	22.47	. Q . . .V .
16.833	11.6972	19.23	. Q . . .V .
16.917	11.8109	16.51	. Q . . .V .
17.000	11.9097	14.34	. Q . . . V .
17.083	12.0002	13.15	. Q . . . V .
17.167	12.0850	12.30	. Q . . . V .
17.250	12.1623	11.23	. Q . . . V .
17.333	12.2327	10.23	. Q . . . V .
17.417	12.2978	9.45	.Q . . . V .
17.500	12.3589	8.87	.Q . . . V .
17.583	12.4173	8.48	.Q . . . V .
17.667	12.4734	8.14	.Q . . . V .
17.750	12.5274	7.84	.Q . . . V .
17.833	12.5795	7.57	.Q . . . V .
17.917	12.6298	7.32	.Q . . . V .
18.000	12.6786	7.08	.Q . . . V .
18.083	12.7260	6.88	.Q . . . V .
18.167	12.7724	6.73	.Q . . . V .
18.250	12.8178	6.60	.Q . . . V .
18.333	12.8622	6.44	.Q . . . V .
18.417	12.9055	6.29	.Q . . . V .
18.500	12.9479	6.15	.Q . . . V .
18.583	12.9892	6.01	.Q . . . V .
18.667	13.0297	5.88	.Q . . . V .
18.750	13.0694	5.76	.Q . . . V .
18.833	13.1082	5.64	.Q . . . V .
18.917	13.1463	5.53	.Q . . . V .
19.000	13.1836	5.42	.Q . . . V .
19.083	13.2202	5.32	.Q . . . V .
19.167	13.2562	5.22	.Q . . . V .
19.250	13.2915	5.13	.Q . . . V .
19.333	13.3262	5.04	.Q . . . V .
19.417	13.3603	4.96	Q . . . V .
19.500	13.3939	4.87	Q . . . V .
19.583	13.4269	4.80	Q . . . V .
19.667	13.4594	4.72	Q . . . V .
19.750	13.4915	4.65	Q . . . V .
19.833	13.5230	4.58	Q . . . V .
19.917	13.5541	4.52	Q . . . V .
20.000	13.5848	4.45	Q . . . V .
20.083	13.6150	4.39	Q . . . V .
20.167	13.6448	4.33	Q . . . V .
20.250	13.6743	4.27	Q . . . V .
20.333	13.7033	4.22	Q . . . V .
20.417	13.7320	4.16	Q . . . V .
20.500	13.7603	4.11	Q . . . V .
20.583	13.7883	4.06	Q . . . V .
20.667	13.8160	4.01	Q . . . V .
20.750	13.8433	3.97	Q . . . V .
20.833	13.8703	3.92	Q . . . V .
20.917	13.8970	3.88	Q . . . V .
21.000	13.9234	3.84	Q . . . V .
21.083	13.9495	3.79	Q . . . V .
21.167	13.9754	3.75	Q . . . V .
21.250	14.0010	3.71	Q . . . V .
21.333	14.0263	3.68	Q . . . V .
21.417	14.0513	3.64	Q . . . V .
21.500	14.0761	3.60	Q . . . V .
21.583	14.1007	3.57	Q . . . V .

```
  21.667     14.1250      3.53  Q         .         .         .       V .
  21.750     14.1491      3.50  Q         .         .         .       V .
  21.833     14.1730      3.46  Q         .         .         .       V .
  21.917     14.1966      3.43  Q         .         .         .       V .
  22.000     14.2200      3.40  Q         .         .         .       V .
  22.083     14.2433      3.37  Q         .         .         .       V .
  22.167     14.2663      3.34  Q         .         .         .       V .
  22.250     14.2891      3.31  Q         .         .         .       V .
  22.333     14.3117      3.28  Q         .         .         .       V .
  22.417     14.3341      3.26  Q         .         .         .       V .
  22.500     14.3564      3.23  Q         .         .         .       V .
  22.583     14.3784      3.20  Q         .         .         .       V .
  22.667     14.4003      3.18  Q         .         .         .       V .
  22.750     14.4220      3.15  Q         .         .         .        V.
  22.833     14.4435      3.13  Q         .         .         .        V.
  22.917     14.4649      3.10  Q         .         .         .        V.
  23.000     14.4860      3.08  Q         .         .         .        V.
  23.083     14.5071      3.05  Q         .         .         .        V.
  23.167     14.5279      3.03  Q         .         .         .        V.
  23.250     14.5487      3.01  Q         .         .         .        V.
  23.333     14.5692      2.99  Q         .         .         .        V.
  23.417     14.5896      2.96  Q         .         .         .        V.
  23.500     14.6099      2.94  Q         .         .         .        V.
  23.583     14.6300      2.92  Q         .         .         .        V.
  23.667     14.6500      2.90  Q         .         .         .        V.
  23.750     14.6698      2.88  Q         .         .         .        V.
  23.833     14.6895      2.86  Q         .         .         .        V.
  23.917     14.7091      2.84  Q         .         .         .        V.
  24.000     14.7285      2.82  Q         .         .         .        V.
  24.083     14.7470      2.69  Q         .         .         .        V.
  24.167     14.7600      1.88  Q         .         .         .        V.
  24.250     14.7673      1.06  Q         .         .         .        V.
  24.333     14.7721      0.70  Q         .         .         .        V.
  24.417     14.7755      0.49  Q         .         .         .        V.
  24.500     14.7779      0.35  Q         .         .         .        V.
  24.583     14.7796      0.25  Q         .         .         .        V.
  24.667     14.7809      0.18  Q         .         .         .        V.
  24.750     14.7818      0.13  Q         .         .         .        V.
  24.833     14.7824      0.09  Q         .         .         .        V.
  24.917     14.7829      0.06  Q         .         .         .        V.
  25.000     14.7832      0.05  Q         .         .         .        V.
  25.083     14.7834      0.03  Q         .         .         .        V.
  25.167     14.7835      0.01  Q         .         .         .        V.
  25.250     14.7836      0.01  Q         .         .         .        V.

****************************************************************************
  FLOW PROCESS FROM NODE   100.00 TO NODE   101.00 IS CODE = 3.1
----------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
============================================================================

                     INFLOW
                   (STREAM 1)
                        |
                        |
                        V                 __effective depth
                 -----------              |   (and volume)
                |           |    |    |
                |           |    |....V........
                | detention |<-->|           outflow
                |   basin   |    |.........._______
                 -----------     |     ^     |  \
                        |        |  dead     |   basin outlet
                        V        | storage |
                     OUTFLOW      ---------
                   (STREAM 1)


        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

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	3.70	0.01	5.740
3	3.83	16.70	5.910
4	4.33	17.70	6.850
5	4.83	18.70	7.830
6	5.33	19.70	8.840
7	5.83	20.60	9.880
8	6.33	21.40	10.950
9	6.83	22.30	12.060
10	7.33	23.10	13.210
11	7.83	23.80	14.390

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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	0.12	0.00	0.00	0.0	0.001
0.167	0.000	0.91	0.00	0.00	0.0	0.007
0.250	0.000	1.72	0.00	0.01	0.0	0.019
0.333	0.000	2.08	0.00	0.02	0.0	0.033
0.417	0.000	2.29	0.00	0.03	0.0	0.049
0.500	0.000	2.44	0.00	0.04	0.0	0.066
0.583	0.000	2.54	0.00	0.05	0.0	0.083
0.667	0.000	2.61	0.00	0.07	0.0	0.101
0.750	0.000	2.67	0.00	0.08	0.0	0.120
0.833	0.000	2.72	0.00	0.09	0.0	0.138
0.917	0.000	2.76	0.00	0.10	0.0	0.157
1.000	0.000	2.78	0.00	0.11	0.0	0.177
1.083	0.000	2.81	0.00	0.13	0.0	0.196
1.167	0.000	2.84	0.00	0.14	0.0	0.215
1.250	0.000	2.85	0.00	0.15	0.0	0.235
1.333	0.000	2.87	0.00	0.16	0.0	0.255
1.417	0.000	2.88	0.00	0.18	0.0	0.275
1.500	0.000	2.89	0.00	0.19	0.0	0.295
1.583	0.000	2.90	0.00	0.20	0.0	0.315
1.667	0.000	2.91	0.00	0.22	0.0	0.335
1.750	0.000	2.92	0.00	0.23	0.0	0.355
1.833	0.000	2.93	0.00	0.24	0.0	0.375
1.917	0.000	2.94	0.00	0.25	0.0	0.395
2.000	0.000	2.95	0.00	0.27	0.0	0.415
2.083	0.000	2.96	0.00	0.28	0.0	0.436
2.167	0.000	2.97	0.00	0.29	0.0	0.456
2.250	0.000	2.98	0.00	0.31	0.0	0.477
2.333	0.000	3.00	0.00	0.32	0.0	0.497
2.417	0.000	3.01	0.00	0.33	0.0	0.518
2.500	0.000	3.02	0.00	0.35	0.0	0.539
2.583	0.000	3.03	0.00	0.36	0.0	0.560
2.667	0.000	3.04	0.00	0.37	0.0	0.581
2.750	0.000	3.05	0.00	0.39	0.0	0.602
2.833	0.000	3.06	0.00	0.40	0.0	0.623
2.917	0.000	3.08	0.00	0.42	0.0	0.644
3.000	0.000	3.09	0.00	0.43	0.0	0.665
3.083	0.000	3.10	0.00	0.44	0.0	0.687
3.167	0.000	3.11	0.00	0.46	0.0	0.708
3.250	0.000	3.12	0.00	0.47	0.0	0.730
3.333	0.000	3.14	0.00	0.48	0.0	0.751
3.417	0.000	3.15	0.00	0.50	0.0	0.773

3.500	0.000	3.16	0.00	0.51	0.0	0.795
3.583	0.000	3.17	0.00	0.53	0.0	0.816
3.667	0.000	3.19	0.00	0.54	0.0	0.838
3.750	0.000	3.20	0.00	0.55	0.0	0.860
3.833	0.000	3.21	0.00	0.57	0.0	0.882
3.917	0.000	3.23	0.00	0.58	0.0	0.905
4.000	0.000	3.24	0.00	0.60	0.0	0.927
4.083	0.000	3.25	0.00	0.61	0.0	0.949
4.167	0.000	3.27	0.00	0.63	0.0	0.972
4.250	0.000	3.28	0.00	0.64	0.0	0.994
4.333	0.000	3.30	0.00	0.66	0.0	1.017
4.417	0.000	3.31	0.00	0.67	0.0	1.040
4.500	0.000	3.32	0.00	0.69	0.0	1.063
4.583	0.000	3.34	0.00	0.70	0.0	1.086
4.667	0.000	3.35	0.00	0.71	0.0	1.109
4.750	0.000	3.37	0.00	0.73	0.0	1.132
4.833	0.000	3.38	0.00	0.74	0.0	1.155
4.917	0.000	3.40	0.00	0.76	0.0	1.179
5.000	0.000	3.41	0.00	0.77	0.0	1.202
5.083	0.000	3.43	0.00	0.79	0.0	1.226
5.167	0.000	3.45	0.00	0.81	0.0	1.250
5.250	0.000	3.46	0.00	0.82	0.0	1.273
5.333	0.000	3.48	0.00	0.84	0.0	1.297
5.417	0.000	3.49	0.00	0.85	0.0	1.321
5.500	0.000	3.51	0.00	0.87	0.0	1.346
5.583	0.000	3.53	0.00	0.88	0.0	1.370
5.667	0.000	3.55	0.00	0.90	0.0	1.394
5.750	0.000	3.56	0.00	0.91	0.0	1.419
5.833	0.000	3.58	0.00	0.93	0.0	1.443
5.917	0.000	3.60	0.00	0.95	0.0	1.468
6.000	0.000	3.62	0.00	0.96	0.0	1.493
6.083	0.000	3.63	0.00	0.98	0.0	1.518
6.167	0.000	3.65	0.00	0.99	0.0	1.543
6.250	0.000	3.67	0.00	1.01	0.0	1.568
6.333	0.000	3.69	0.00	1.03	0.0	1.594
6.417	0.000	3.71	0.00	1.04	0.0	1.619
6.500	0.000	3.73	0.00	1.06	0.0	1.645
6.583	0.000	3.75	0.00	1.08	0.0	1.671
6.667	0.000	3.77	0.00	1.09	0.0	1.697
6.750	0.000	3.79	0.00	1.11	0.0	1.723
6.833	0.000	3.81	0.00	1.13	0.0	1.749
6.917	0.000	3.83	0.00	1.14	0.0	1.775
7.000	0.000	3.85	0.00	1.16	0.0	1.802
7.083	0.000	3.87	0.00	1.18	0.0	1.829
7.167	0.000	3.90	0.00	1.20	0.0	1.855
7.250	0.000	3.92	0.00	1.21	0.0	1.882
7.333	0.000	3.94	0.00	1.23	0.0	1.909
7.417	0.000	3.96	0.00	1.25	0.0	1.937
7.500	0.000	3.99	0.00	1.27	0.0	1.964
7.583	0.000	4.01	0.00	1.28	0.0	1.992
7.667	0.000	4.03	0.00	1.30	0.0	2.020
7.750	0.000	4.06	0.00	1.32	0.0	2.047
7.833	0.000	4.08	0.00	1.34	0.0	2.076
7.917	0.000	4.11	0.00	1.36	0.0	2.104
8.000	0.000	4.13	0.00	1.37	0.0	2.132
8.083	0.000	4.16	0.00	1.39	0.0	2.161
8.167	0.000	4.19	0.00	1.41	0.0	2.190
8.250	0.000	4.21	0.00	1.43	0.0	2.219
8.333	0.000	4.24	0.00	1.45	0.0	2.248
8.417	0.000	4.27	0.00	1.47	0.0	2.277
8.500	0.000	4.30	0.00	1.49	0.0	2.307
8.583	0.000	4.32	0.00	1.51	0.0	2.336
8.667	0.000	4.35	0.00	1.53	0.0	2.366
8.750	0.000	4.38	0.00	1.54	0.0	2.397
8.833	0.000	4.41	0.00	1.56	0.0	2.427
8.917	0.000	4.44	0.00	1.58	0.0	2.457
9.000	0.000	4.48	0.00	1.60	0.0	2.488
9.083	0.000	4.51	0.00	1.62	0.0	2.519
9.167	0.000	4.54	0.00	1.64	0.0	2.550
9.250	0.000	4.57	0.00	1.66	0.0	2.582
9.333	0.000	4.61	0.00	1.68	0.0	2.614
9.417	0.000	4.64	0.00	1.71	0.0	2.646
9.500	0.000	4.68	0.00	1.73	0.0	2.678

9.583	0.000	4.71	0.00	1.75	0.0	2.710
9.667	0.000	4.75	0.00	1.77	0.0	2.743
9.750	0.000	4.79	0.00	1.79	0.0	2.776
9.833	0.000	4.82	0.00	1.81	0.0	2.809
9.917	0.000	4.86	0.00	1.83	0.0	2.842
10.000	0.000	4.90	0.00	1.85	0.0	2.876
10.083	0.000	4.94	0.00	1.88	0.0	2.910
10.167	0.000	4.98	0.00	1.90	0.0	2.944
10.250	0.000	5.03	0.00	1.92	0.0	2.979
10.333	0.000	5.07	0.00	1.94	0.0	3.014
10.417	0.000	5.11	0.00	1.97	0.0	3.049
10.500	0.000	5.16	0.00	1.99	0.0	3.085
10.583	0.000	5.21	0.00	2.01	0.0	3.120
10.667	0.000	5.25	0.00	2.03	0.0	3.157
10.750	0.000	5.30	0.00	2.06	0.0	3.193
10.833	0.000	5.35	0.00	2.08	0.0	3.230
10.917	0.000	5.40	0.00	2.11	0.0	3.267
11.000	0.000	5.46	0.00	2.13	0.0	3.305
11.083	0.000	5.51	0.00	2.15	0.0	3.342
11.167	0.000	5.57	0.00	2.18	0.0	3.381
11.250	0.000	5.62	0.00	2.20	0.0	3.419
11.333	0.000	5.68	0.00	2.23	0.0	3.458
11.417	0.000	5.74	0.00	2.25	0.0	3.498
11.500	0.000	5.80	0.00	2.28	0.0	3.538
11.583	0.000	5.87	0.00	2.31	0.0	3.578
11.667	0.000	5.93	0.00	2.33	0.0	3.619
11.750	0.000	6.00	0.00	2.36	0.0	3.660
11.833	0.000	6.07	0.00	2.39	0.0	3.702
11.917	0.000	6.14	0.00	2.41	0.0	3.744
12.000	0.000	6.21	0.00	2.44	0.0	3.787
12.083	0.000	6.28	0.00	2.47	0.0	3.830
12.167	0.000	6.31	0.00	2.50	0.0	3.874
12.250	0.000	6.34	0.00	2.53	0.0	3.917
12.333	0.000	6.41	0.00	2.55	0.0	3.961
12.417	0.000	6.48	0.00	2.58	0.0	4.006
12.500	0.000	6.56	0.00	2.61	0.0	4.051
12.583	0.000	6.65	0.00	2.64	0.0	4.097
12.667	0.000	6.74	0.00	2.67	0.0	4.143
12.750	0.000	6.83	0.00	2.70	0.0	4.190
12.833	0.000	6.94	0.00	2.73	0.0	4.238
12.917	0.000	7.04	0.00	2.76	0.0	4.286
13.000	0.000	7.15	0.00	2.79	0.0	4.335
13.083	0.000	7.27	0.00	2.83	0.0	4.385
13.167	0.000	7.39	0.00	2.86	0.0	4.436
13.250	0.000	7.51	0.00	2.89	0.0	4.488
13.333	0.000	7.65	0.00	2.93	0.0	4.540
13.417	0.000	7.78	0.00	2.96	0.0	4.594
13.500	0.000	7.93	0.00	3.00	0.0	4.649
13.583	0.000	8.08	0.00	3.03	0.0	4.704
13.667	0.000	8.24	0.00	3.07	0.0	4.761
13.750	0.000	8.41	0.00	3.11	0.0	4.819
13.833	0.000	8.59	0.00	3.14	0.0	4.878
13.917	0.000	8.78	0.00	3.18	0.0	4.938
14.000	0.000	8.98	0.00	3.22	0.0	5.000
14.083	0.000	9.14	0.00	3.26	0.0	5.063
14.167	0.000	9.03	0.00	3.30	0.0	5.125
14.250	0.000	8.92	0.00	3.34	0.0	5.186
14.333	0.000	9.02	0.00	3.38	0.0	5.249
14.417	0.000	9.19	0.00	3.42	0.0	5.312
14.500	0.000	9.42	0.00	3.47	0.0	5.377
14.583	0.000	9.69	0.00	3.51	0.0	5.443
14.667	0.000	10.00	0.00	3.55	0.0	5.512
14.750	0.000	10.33	0.00	3.60	0.0	5.583
14.833	0.000	10.72	0.00	3.65	0.0	5.657
14.917	0.000	11.14	0.00	3.70	0.0	5.734
15.000	0.000	11.63	0.00	3.74	2.7	5.795
15.083	0.000	12.16	0.00	3.77	7.1	5.830
15.167	0.000	12.78	0.00	3.78	9.8	5.850
15.250	0.000	13.46	0.00	3.79	11.5	5.864
15.333	0.000	14.29	0.00	3.80	12.7	5.875
15.417	0.000	15.20	0.00	3.81	13.7	5.885
15.500	0.000	16.26	0.00	3.82	14.7	5.895
15.583	0.000	17.52	0.00	3.83	15.8	5.907

15.667	0.000	19.26	0.00	3.84	16.6	5.926
15.750	0.000	22.27	0.00	3.86	16.7	5.964
15.833	0.000	30.75	0.00	3.91	16.8	6.060
15.917	0.000	41.05	0.00	4.00	16.9	6.226
16.000	0.000	53.21	0.00	4.13	17.2	6.474
16.083	0.000	75.67	0.00	4.34	17.5	6.874
16.167	0.000	123.16	0.00	4.71	18.1	7.598
16.250	0.000	118.08	0.00	5.05	18.8	8.282
16.333	0.000	75.14	0.00	5.24	19.3	8.666
16.417	0.000	52.42	0.00	5.35	19.6	8.892
16.500	0.000	40.34	0.00	5.42	19.8	9.033
16.583	0.000	32.16	0.00	5.46	19.9	9.118
16.667	0.000	26.65	0.00	5.49	20.0	9.164
16.750	0.000	22.47	0.00	5.49	20.0	9.181
16.833	0.000	19.23	0.00	5.49	20.0	9.176
16.917	0.000	16.51	0.00	5.48	20.0	9.152
17.000	0.000	14.34	0.00	5.46	20.0	9.113
17.083	0.000	13.15	0.00	5.44	19.9	9.067
17.167	0.000	12.30	0.00	5.41	19.9	9.014
17.250	0.000	11.23	0.00	5.39	19.8	8.955
17.333	0.000	10.23	0.00	5.35	19.8	8.889
17.417	0.000	9.45	0.00	5.32	19.7	8.819
17.500	0.000	8.87	0.00	5.28	19.6	8.745
17.583	0.000	8.48	0.00	5.24	19.6	8.668
17.667	0.000	8.14	0.00	5.21	19.5	8.590
17.750	0.000	7.84	0.00	5.17	19.4	8.510
17.833	0.000	7.57	0.00	5.13	19.3	8.429
17.917	0.000	7.32	0.00	5.09	19.3	8.347
18.000	0.000	7.08	0.00	5.04	19.2	8.264
18.083	0.000	6.88	0.00	5.00	19.1	8.180
18.167	0.000	6.73	0.00	4.96	19.0	8.095
18.250	0.000	6.60	0.00	4.92	18.9	8.010
18.333	0.000	6.44	0.00	4.88	18.8	7.925
18.417	0.000	6.29	0.00	4.83	18.8	7.839
18.500	0.000	6.15	0.00	4.79	18.7	7.753
18.583	0.000	6.01	0.00	4.75	18.6	7.666
18.667	0.000	5.88	0.00	4.70	18.5	7.580
18.750	0.000	5.76	0.00	4.66	18.4	7.493
18.833	0.000	5.64	0.00	4.61	18.3	7.405
18.917	0.000	5.53	0.00	4.57	18.2	7.318
19.000	0.000	5.42	0.00	4.52	18.1	7.230
19.083	0.000	5.32	0.00	4.48	18.0	7.143
19.167	0.000	5.22	0.00	4.43	18.0	7.055
19.250	0.000	5.13	0.00	4.39	17.9	6.967
19.333	0.000	5.04	0.00	4.35	17.8	6.879
19.417	0.000	4.96	0.00	4.30	17.7	6.792
19.500	0.000	4.87	0.00	4.25	17.6	6.704
19.583	0.000	4.80	0.00	4.21	17.5	6.617
19.667	0.000	4.72	0.00	4.16	17.4	6.529
19.750	0.000	4.65	0.00	4.11	17.3	6.442
19.833	0.000	4.58	0.00	4.07	17.2	6.355
19.917	0.000	4.52	0.00	4.02	17.1	6.268
20.000	0.000	4.45	0.00	3.97	17.0	6.182
20.083	0.000	4.39	0.00	3.93	16.9	6.095
20.167	0.000	4.33	0.00	3.88	16.9	6.009
20.250	0.000	4.27	0.00	3.84	16.8	5.923
20.333	0.000	4.22	0.00	3.79	14.0	5.855
20.417	0.000	4.16	0.00	3.76	9.5	5.818
20.500	0.000	4.11	0.00	3.75	6.8	5.800
20.583	0.000	4.06	0.00	3.74	5.4	5.791
20.667	0.000	4.01	0.00	3.73	4.7	5.786
20.750	0.000	3.97	0.00	3.73	4.4	5.783
20.833	0.000	3.92	0.00	3.73	4.1	5.781
20.917	0.000	3.88	0.00	3.73	4.0	5.780
21.000	0.000	3.84	0.00	3.73	3.9	5.780
21.083	0.000	3.79	0.00	3.73	3.9	5.779
21.167	0.000	3.75	0.00	3.73	3.8	5.779
21.250	0.000	3.71	0.00	3.73	3.8	5.778
21.333	0.000	3.68	0.00	3.73	3.7	5.778
21.417	0.000	3.64	0.00	3.73	3.7	5.777
21.500	0.000	3.60	0.00	3.73	3.7	5.777
21.583	0.000	3.57	0.00	3.73	3.6	5.777
21.667	0.000	3.53	0.00	3.73	3.6	5.776

PEAK DISCHARGE

21.750	0.000	3.50	0.00	3.73	3.5	5.776
21.833	0.000	3.46	0.00	3.73	3.5	5.776
21.917	0.000	3.43	0.00	3.73	3.5	5.775
22.000	0.000	3.40	0.00	3.73	3.4	5.775
22.083	0.000	3.37	0.00	3.73	3.4	5.775
22.167	0.000	3.34	0.00	3.73	3.4	5.774
22.250	0.000	3.31	0.00	3.73	3.4	5.774
22.333	0.000	3.28	0.00	3.73	3.3	5.774
22.417	0.000	3.26	0.00	3.73	3.3	5.773
22.500	0.000	3.23	0.00	3.73	3.3	5.773
22.583	0.000	3.20	0.00	3.73	3.2	5.773
22.667	0.000	3.18	0.00	3.72	3.2	5.773
22.750	0.000	3.15	0.00	3.72	3.2	5.772
22.833	0.000	3.13	0.00	3.72	3.2	5.772
22.917	0.000	3.10	0.00	3.72	3.1	5.772
23.000	0.000	3.08	0.00	3.72	3.1	5.771
23.083	0.000	3.05	0.00	3.72	3.1	5.771
23.167	0.000	3.03	0.00	3.72	3.1	5.771
23.250	0.000	3.01	0.00	3.72	3.0	5.771
23.333	0.000	2.99	0.00	3.72	3.0	5.771
23.417	0.000	2.96	0.00	3.72	3.0	5.770
23.500	0.000	2.94	0.00	3.72	3.0	5.770
23.583	0.000	2.92	0.00	3.72	3.0	5.770
23.667	0.000	2.90	0.00	3.72	2.9	5.770
23.750	0.000	2.88	0.00	3.72	2.9	5.769
23.833	0.000	2.86	0.00	3.72	2.9	5.769
23.917	0.000	2.84	0.00	3.72	2.9	5.769

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 14.784 AF

BASIN STORAGE = 5.047 AF (WITH 0.000 AF INITIALLY FILLED)

OUTFLOW VOLUME = 9.738 AF

LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

SEE OFFSITE HYDROLOGY MAP (SHT. 1) FOR LOCATION.

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_____________________________________________________________________________
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-----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:31 05/17/2022
=============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - EAST CHANNEL 1
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    10.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.027300
    UNIFORM FLOW(CFS) =       55.00
    MANNINGS FRICTION FACTOR = 0.0300
=============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   0.78
    FLOW TOP-WIDTH(FEET) =        12.34
    FLOW AREA(SQUARE FEET) =           8.71
    HYDRAULIC DEPTH(FEET) =     0.71
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     6.31
    UNIFORM FROUDE NUMBER =    1.324
    PRESSURE + MOMENTUM(POUNDS) =          877.42
    AVERAGED VELOCITY HEAD(FEET) =      0.619
    SPECIFIC ENERGY(FEET) =      1.399
=============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        12.80
    CRITICAL FLOW AREA(SQUARE FEET) =          10.64
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     0.83
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     5.17
    CRITICAL DEPTH(FEET) =     0.93
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =          848.10
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.415
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      1.348
=============================================================================

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - EAST CHANNEL 2
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    10.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.027300
```

```
    UNIFORM FLOW(CFS) =      110.00
    MANNINGS FRICTION FACTOR = 0.0300
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   1.17
    FLOW TOP-WIDTH(FEET) =        13.51
    FLOW AREA(SQUARE FEET) =          13.74
    HYDRAULIC DEPTH(FEET) =     1.02
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.00
    UNIFORM FROUDE NUMBER =    1.398
    PRESSURE + MOMENTUM(POUNDS) =         2182.64
    AVERAGED VELOCITY HEAD(FEET) =      0.995
    SPECIFIC ENERGY(FEET) =      2.164
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        14.32
    CRITICAL FLOW AREA(SQUARE FEET) =          17.53
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     1.22
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     6.28
    CRITICAL DEPTH(FEET) =     1.44
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         2079.24
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.612
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      2.053
==============================================================================

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - EAST CHANNEL 3
******************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
------------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    10.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.027300
    UNIFORM FLOW(CFS) =      170.00
    MANNINGS FRICTION FACTOR = 0.0300
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   1.50
    FLOW TOP-WIDTH(FEET) =        14.51
    FLOW AREA(SQUARE FEET) =          18.45
    HYDRAULIC DEPTH(FEET) =     1.27
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.22
    UNIFORM FROUDE NUMBER =    1.441
    PRESSURE + MOMENTUM(POUNDS) =         3849.08
    AVERAGED VELOCITY HEAD(FEET) =      1.319
    SPECIFIC ENERGY(FEET) =      2.824
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        15.65
    CRITICAL FLOW AREA(SQUARE FEET) =          24.14
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     1.54
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     7.04
    CRITICAL DEPTH(FEET) =     1.88
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         3633.75
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.770
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      2.653
==============================================================================
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-----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:40 05/17/2022
=============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - CHANNEL 4
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    10.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.019200
    UNIFORM FLOW(CFS) =      230.00
    MANNINGS FRICTION FACTOR = 0.0300
=============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   1.98
    FLOW TOP-WIDTH(FEET) =        15.93
    FLOW AREA(SQUARE FEET) =          25.65
    HYDRAULIC DEPTH(FEET) =     1.61
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.97
    UNIFORM FROUDE NUMBER =    1.246
    PRESSURE + MOMENTUM(POUNDS) =         5459.08
    AVERAGED VELOCITY HEAD(FEET) =      1.249
    SPECIFIC ENERGY(FEET) =      3.227
=============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        16.77
    CRITICAL FLOW AREA(SQUARE FEET) =          30.20
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     1.80
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     7.61
    CRITICAL DEPTH(FEET) =     2.26
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         5341.33
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.900
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      3.157
=============================================================================

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - CHANNEL 5
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    10.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.019200
```

```
    UNIFORM FLOW(CFS) =      295.00
    MANNINGS FRICTION FACTOR = 0.0300
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   2.27
    FLOW TOP-WIDTH(FEET) =        16.81
    FLOW AREA(SQUARE FEET) =          30.46
    HYDRAULIC DEPTH(FEET) =     1.81
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.69
    UNIFORM FROUDE NUMBER =    1.268
    PRESSURE + MOMENTUM(POUNDS) =         7512.91
    AVERAGED VELOCITY HEAD(FEET) =      1.457
    SPECIFIC ENERGY(FEET) =      3.728
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        17.84
    CRITICAL FLOW AREA(SQUARE FEET) =          36.39
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.04
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.11
    CRITICAL DEPTH(FEET) =     2.61
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         7323.61
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.020
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      3.634
==============================================================================

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - CHANNEL 6
******************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
------------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    10.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.015600
    UNIFORM FLOW(CFS) =      360.00
    MANNINGS FRICTION FACTOR = 0.0300
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   2.69
    FLOW TOP-WIDTH(FEET) =        18.06
    FLOW AREA(SQUARE FEET) =          37.71
    HYDRAULIC DEPTH(FEET) =     2.09
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.55
    UNIFORM FROUDE NUMBER =    1.164
    PRESSURE + MOMENTUM(POUNDS) =         9519.35
    AVERAGED VELOCITY HEAD(FEET) =      1.415
    SPECIFIC ENERGY(FEET) =      4.103
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        18.81
    CRITICAL FLOW AREA(SQUARE FEET) =          42.29
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.25
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.51
    CRITICAL DEPTH(FEET) =     2.94
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         9417.84
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.125
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      4.061
==============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:47 05/17/2022
============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - WEST CHANNEL 7
****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.009200
    UNIFORM FLOW(CFS) =      470.00
    MANNINGS FRICTION FACTOR = 0.0300
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   2.55
    FLOW TOP-WIDTH(FEET) =        27.65
    FLOW AREA(SQUARE FEET) =          60.76
    HYDRAULIC DEPTH(FEET) =     2.20
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     7.74
    UNIFORM FROUDE NUMBER =    0.920
    PRESSURE + MOMENTUM(POUNDS) =        11621.11
    AVERAGED VELOCITY HEAD(FEET) =      0.929
    SPECIFIC ENERGY(FEET) =      3.479
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        27.26
    CRITICAL FLOW AREA(SQUARE FEET) =          57.22
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.10
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.21
    CRITICAL DEPTH(FEET) =     2.42
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =        11582.50
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.048
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      3.469
============================================================================

 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  GUSTINE - WEST CHANNEL 8
****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.009200
```

```
    UNIFORM FLOW(CFS) =      580.00
    MANNINGS FRICTION FACTOR = 0.0300
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   2.88
    FLOW TOP-WIDTH(FEET) =        28.63
    FLOW AREA(SQUARE FEET) =          69.99
    HYDRAULIC DEPTH(FEET) =     2.44
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.29
    UNIFORM FROUDE NUMBER =    0.934
    PRESSURE + MOMENTUM(POUNDS) =        15227.40
    AVERAGED VELOCITY HEAD(FEET) =      1.066
    SPECIFIC ENERGY(FEET) =      3.945
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        28.28
    CRITICAL FLOW AREA(SQUARE FEET) =          66.62
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.36
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.71
    CRITICAL DEPTH(FEET) =     2.76
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =        15193.84
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.177
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      3.937
==============================================================================
```

SEE OFFSITE HYDROLOGY MAP (SHT. 1) FOR LOCATION.

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:10 05/17/2022
============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  CENTRAL CH1
****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.001300
    UNIFORM FLOW(CFS) =      150.00
    MANNINGS FRICTION FACTOR = 0.0300
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   2.32
    FLOW TOP-WIDTH(FEET) =        26.95
    FLOW AREA(SQUARE FEET) =          54.40
    HYDRAULIC DEPTH(FEET) =     2.02
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     2.76
    UNIFORM FROUDE NUMBER =    0.342
    PRESSURE + MOMENTUM(POUNDS) =         4540.94
    AVERAGED VELOCITY HEAD(FEET) =      0.118
    SPECIFIC ENERGY(FEET) =      2.435
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        23.51
    CRITICAL FLOW AREA(SQUARE FEET) =          25.44
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     1.08
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     5.90
    CRITICAL DEPTH(FEET) =     1.17
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         2617.20
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.540
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      1.709
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 10:03 05/17/2022
============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  CENTRAL - CH2
****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.027800
    UNIFORM FLOW(CFS) =      285.00
    MANNINGS FRICTION FACTOR = 0.0300
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   1.38
    FLOW TOP-WIDTH(FEET) =        24.13
    FLOW AREA(SQUARE FEET) =          30.34
    HYDRAULIC DEPTH(FEET) =     1.26
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.39
    UNIFORM FROUDE NUMBER =    1.476
    PRESSURE + MOMENTUM(POUNDS) =         6449.14
    AVERAGED VELOCITY HEAD(FEET) =      1.370
    SPECIFIC ENERGY(FEET) =      2.745
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        25.30
    CRITICAL FLOW AREA(SQUARE FEET) =          39.99
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     1.58
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     7.13
    CRITICAL DEPTH(FEET) =     1.77
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         6053.25
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.789
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      2.554
============================================================================
```

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-----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:13 05/17/2022
=============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  CENTRAL - CH3
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.017900
    UNIFORM FLOW(CFS) =      700.00
    MANNINGS FRICTION FACTOR = 0.0300
=============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   2.65
    FLOW TOP-WIDTH(FEET) =        27.94
    FLOW AREA(SQUARE FEET) =          63.41
    HYDRAULIC DEPTH(FEET) =     2.27
    FLOW AVERAGE VELOCITY(FEET/SEC.) =    11.04
    UNIFORM FROUDE NUMBER =    1.291
    PRESSURE + MOMENTUM(POUNDS) =        19920.34
    AVERAGED VELOCITY HEAD(FEET) =      1.892
    SPECIFIC ENERGY(FEET) =      4.538
=============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        29.29
    CRITICAL FLOW AREA(SQUARE FEET) =          76.36
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.61
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.17
    CRITICAL DEPTH(FEET) =     3.10
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =        19352.54
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.305
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      4.403
=============================================================================
```

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-----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:15 05/17/2022
=============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  CENTRAL - CH4
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.009300
    UNIFORM FLOW(CFS) =      700.00
    MANNINGS FRICTION FACTOR = 0.0300
=============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   3.19
    FLOW TOP-WIDTH(FEET) =        29.58
    FLOW AREA(SQUARE FEET) =          79.21
    HYDRAULIC DEPTH(FEET) =     2.68
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     8.84
    UNIFORM FROUDE NUMBER =    0.952
    PRESSURE + MOMENTUM(POUNDS) =        19374.93
    AVERAGED VELOCITY HEAD(FEET) =      1.213
    SPECIFIC ENERGY(FEET) =      4.408
=============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        29.29
    CRITICAL FLOW AREA(SQUARE FEET) =          76.36
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.61
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.17
    CRITICAL DEPTH(FEET) =     3.10
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =        19352.54
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.305
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      4.403
=============================================================================
```
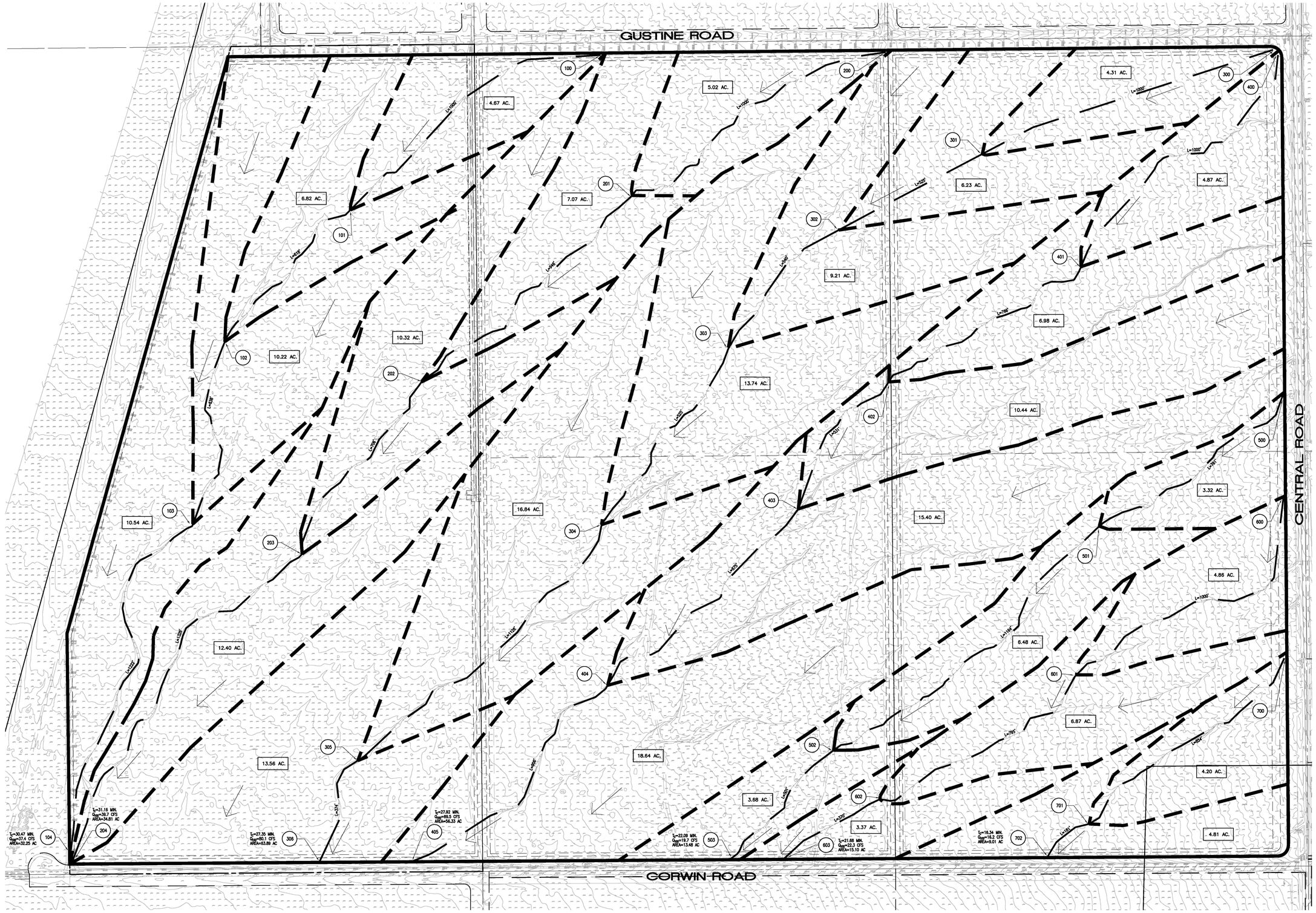
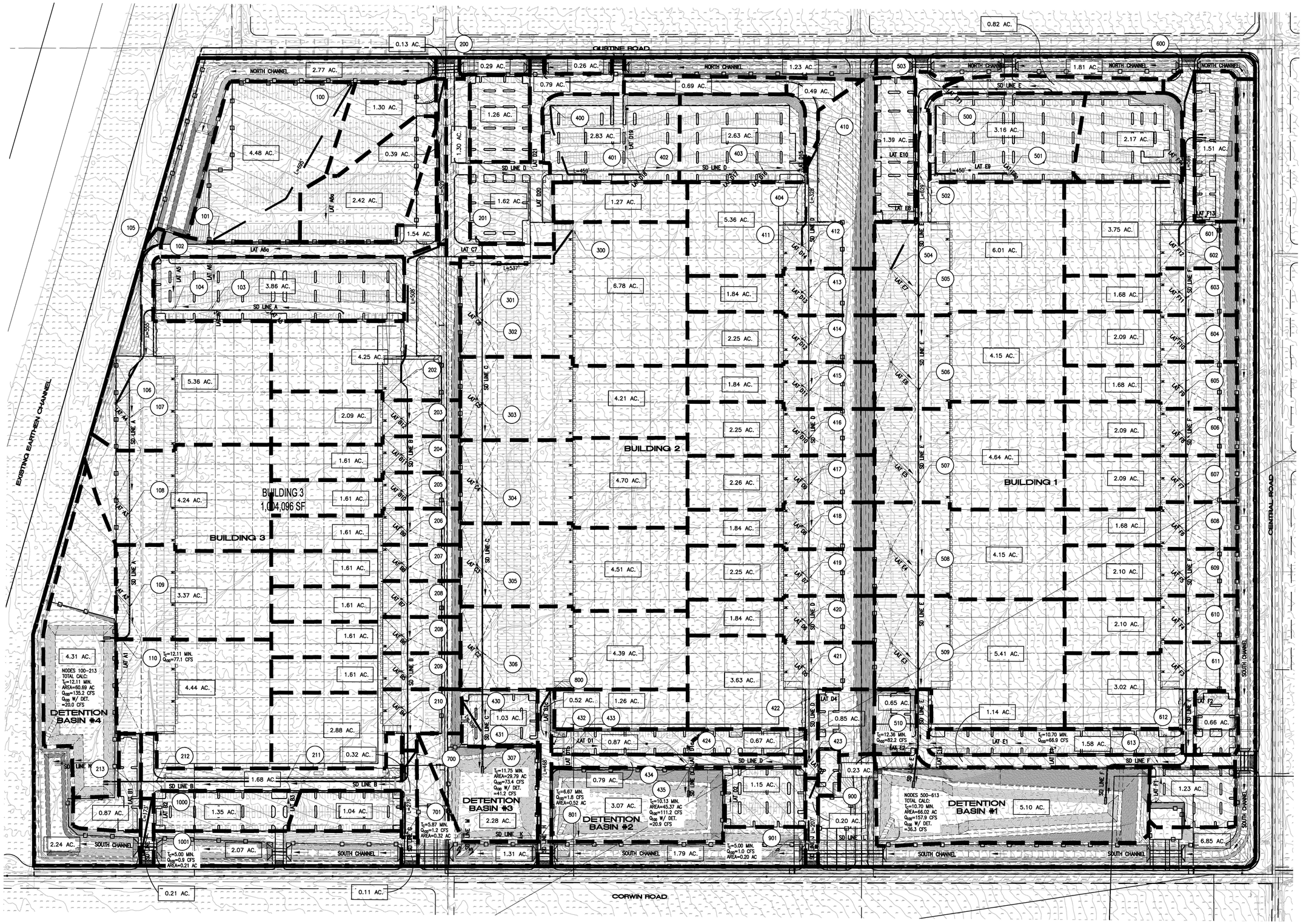
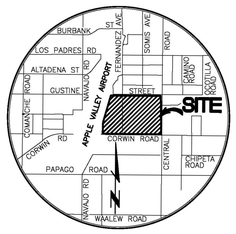

```
_____________________________________________________________________________
*****************************************************************************
                 HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
         (C) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                           Analysis prepared by:



-----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 09:18 05/17/2022
=============================================================================
 Problem Descriptions:
  TEI JOB NO. 4099
  PROPOSED CHANNEL
  CENTRAL - CH5
*****************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
-----------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.50
            Z2(HORIZONTAL/VERTICAL) =    1.50
    BASEWIDTH(FEET) =    20.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.005000
    UNIFORM FLOW(CFS) =      700.00
    MANNINGS FRICTION FACTOR = 0.0300
=============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   3.81
    FLOW TOP-WIDTH(FEET) =        31.44
    FLOW AREA(SQUARE FEET) =          98.06
    HYDRAULIC DEPTH(FEET) =     3.12
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     7.14
    UNIFORM FROUDE NUMBER =    0.712
    PRESSURE + MOMENTUM(POUNDS) =        20484.00
    AVERAGED VELOCITY HEAD(FEET) =      0.791
    SPECIFIC ENERGY(FEET) =      4.604
=============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
-----------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =        29.29
    CRITICAL FLOW AREA(SQUARE FEET) =          76.36
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     2.61
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     9.17
    CRITICAL DEPTH(FEET) =     3.10
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =        19352.54
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      1.305
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      4.403
=============================================================================
```

APPENDIX D

HYDROLOGY MAPS


GUSTINE ROAD
CORWIN ROAD
CENTRAL ROAD
100
101
102
103
104
200
201
202
203
204
300
301
302
303
304
305
400
401
402
403
404
405
500
501
502
503
600
601
602
603
700
701
702
4.67 AC.
5.02 AC.
4.31 AC.
6.82 AC.
7.07 AC.
6.23 AC.
4.87 AC.
9.21 AC.
10.32 AC.
10.22 AC.
6.98 AC.
13.74 AC.
10.44 AC.
10.54 AC.
16.84 AC.
15.40 AC.
3.32 AC.
4.86 AC.
12.40 AC.
6.48 AC.
13.56 AC.
18.64 AC.
6.87 AC.
3.68 AC.
4.20 AC.
3.37 AC.
4.81 AC.
L=1000'
L=1320'
L=1080'
L=1040'
L=1060'
L=1200'
L=1100'
L=1120'
L=1180'
L=1160'
L=1140'
L=1220'
L=1240'
L=1260'
L=1280'
L=1300'
L=1320'
L=1340'
L=1360'
L=1380'
L=1400'
L=1420'
L=1440'
L=1460'
L=1480'
L=1500'
L=1520'
L=1540'
L=1560'
L=1580'
L=1600'
L=1620'
L=1640'
L=1660'
L=1680'
L=1700'
L=1720'
L=1740'
L=1760'
L=1780'
L=1800'
L=1820'
L=1840'
L=1860'
L=1880'
L=1900'
L=1920'
L=1940'
L=1960'
L=1980'
L=2000'





VICINITY MAP

N.T.S.

LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 4.10 AC. — SUBAREA AREA
- 100 — NODE NUMBER
- PIPE/CHANNEL FLOW DIRECTION

0 60 120 240 360

SCALE:1"= 120'

SOIL TYPE: "C"
RAINFALL: 1.05"

TOPOGRAPHIC SURVEY AND MAPPING SOURCE:
- THIENES ENGINEERING, INC. 4/5/2022
- CENTRAL COAST AERIAL MAPPING 3/30/2022

Last Update: 9/5/24
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CITY OF APPLE VALLEY

PUBLIC WORKS DEPARTMENT

PROPOSED CONDITION HYDROLOGY MAP

APPLE VALLEY ASSEMBLAGE

SW CORNER OF QUSTINE ROAD AND CENTRAL ROAD

PREPARED FOR:

LAKE CREEK INDUSTRIAL LLC
1302 BRITNEY CROSS ROAD
SANTA ANA, CA 92705
PHONE: (949) 910-4616

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14-3349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by		Approved by	Date
Date			
Checked by			
Date			
Designed by		Public Works Director	R.C.E. XXXXX
Date			
Checked by			
Date		Sheet 1 of 1 Sheets	

4099/1 OF 1 SHEET

LOS PADRES RD

FERNANDEZ

CENTRAL RD

DUNSMUIR ST

ALTADENA ST

PAUCHASKA RD

Mojave Deser

EARLIMONT ST

GUSTINE ST

SOMS AVE

CAMINO RD

CORW

Apple Valley Airport

SEE MATCHLINE SHEET 2

NORTH CH7

NORTH CH4

NORTH CH1

SOUTH CH1

SOUTH CH2

SOUTH CH5

SOUTH CH4

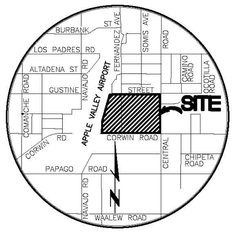
SOUTH CH3

SEE ONSITE HYDROLOGY MAP

BUILDING 3
1,004,096 SF

Node	Area	Land use
105	30.08 AC.	BARREN
	0.76 AC.	RESIDENTIAL
106	1.86 AC.	RESIDENTIAL
	37.82 AC.	BARREN
107	41.93 AC.	
206	30.30 AC.	BARREN
	4.70 AC.	RESIDENTIAL
305	23.67 AC.	
207	35.25 AC.	BARREN
	1.00 AC.	RESIDENTIAL
108	32.83 AC.	
208	T_c=30.32 MIN. Q_{100}=213.6 CFS AREA=169.60 AC	
306	T_c=27.95 MIN. Q_{100}=184.0 CFS AREA=138.40 AC	
405	T_c=24.13 MIN. Q_{100}=161.2 CFS AREA=109.70 AC	
	30.32 AC.	BARREN
	7.58 AC.	RESIDENTIAL
406	21.51 AC.	BARREN
	0.13 AC.	RESIDENTIAL
	20.43 AC.	BARREN
	9.45 AC.	RESIDENTIAL
506	90.75 AC.	BARREN
	0.85 AC.	RESIDENTIAL
407	48.27 AC.	
408	T_c=24.91 MIN. Q_{100}=184.4 CFS AREA=128.20 AC	
507		
508	T_c=20.84 MIN. Q_{100}=507.1 CFS AREA=313.00 AC	

L=1618'
L=2400'
L=2036'
L=2092'
L=1575'
L=2364'
L=1103'
L=4820'
L=1919'
L=1727'
L=979'
L=2378'
L=774'



VICINITY MAP
N.T.S.

LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 4.10 AC. — SUBAREA AREA
- 100 — NODE NUMBER

SOIL TYPE: "C"
RAINFALL: 1.05"

0 100 200 400 600
SCALE:1"= 200'

Last Update: 9/5/24
O:\4000--4099\4099\4099-HYD-OFFSITE.dwg

CITY OF APPLE VALLEY
PUBLIC WORKS DEPARTMENT

OFFSITE CONDITION HYDROLOGY MAP

APPLE VALLEY ASSEMBLAGE

SW CORNER OF QUSTINE ROAD AND CENTRAL ROAD

PREPARED FOR:
LAKE CREEK INDUSTRIAL LLC
1302 BRITNEY CROSS ROAD
SANTA ANA, CA 92705
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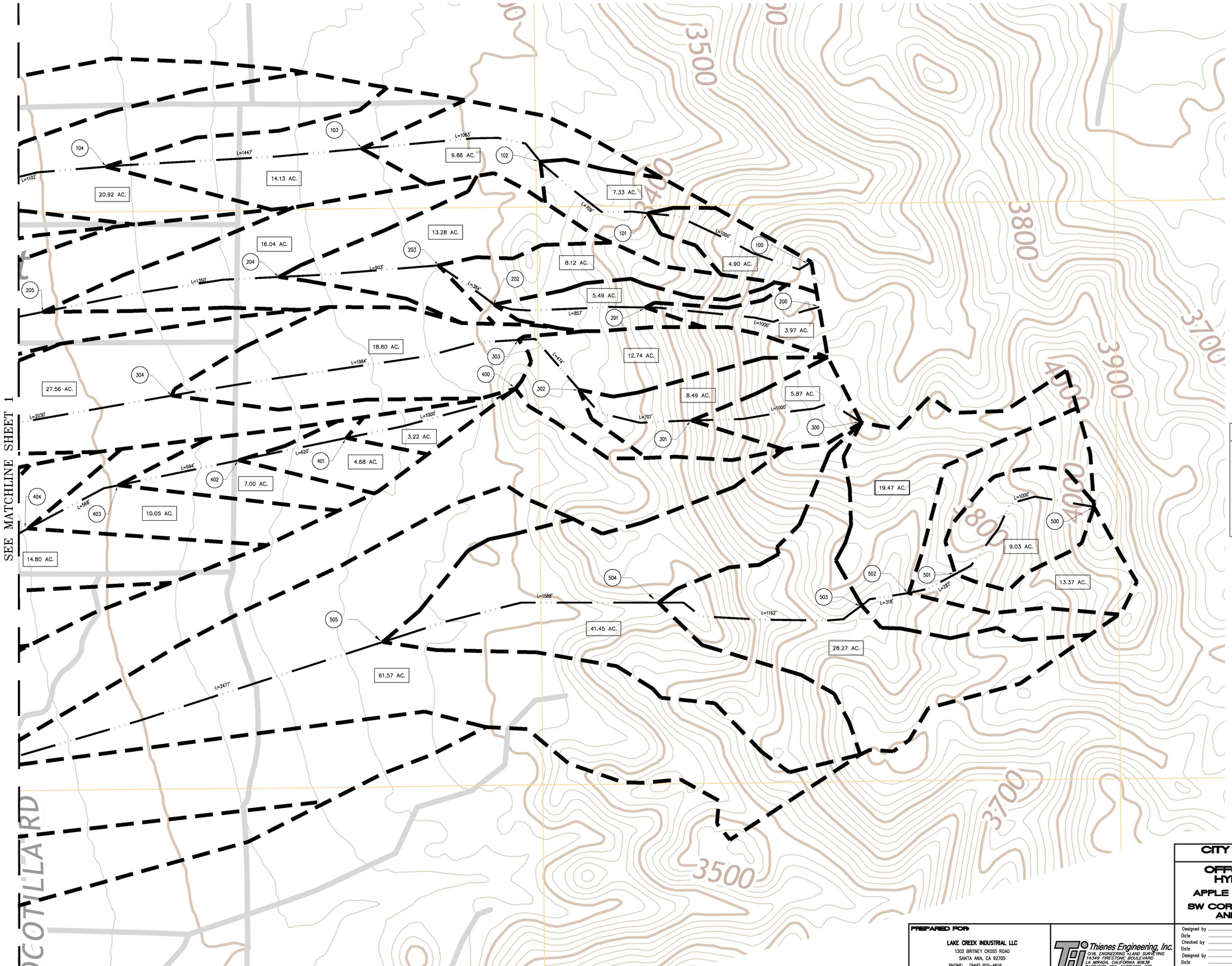
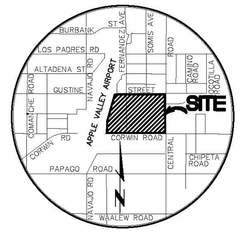
Designed by
Date
Checked by
Date
Designed by
Date
Checked by
Date

Approved by Date
Public Works Director R.C.E. XXXXX

Sheet 1 of 2 Sheets

4099/1 OF 2 SHEET





VICINITY MAP

N.T.S.

LEGEND

	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	FLOW PATH
4.10 AC.	SUBAREA AREA
100	NODE NUMBER

0 100 200 400 600

SCALE: 1"= 200'

Last Update: 8/2/22
Q:\4000-4099\4099\4099H1D-OFFSITE.dwg

CITY OF APPLE VALLEY

PUBLIC WORKS DEPARTMENT

OFFSITE CONDITION HYDROLOGY MAP

APPLE VALLEY ASSEMBLAGE

SW CORNER OF GUSTINE ROAD AND CENTRAL ROAD

PREPARED FOR:

LAKE CREEK INDUSTRIAL LLC
1302 BRITNEY CROSS ROAD
SANTA ANA, CA 92705
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Designed by	Approved by Date
Date	
Checked by	
Date	
Designed by	Public Works Director R.C.E. XXXXX
Date	
Checked by	
Date	Sheet 2 of 2 Sheets

4099/2 OF 2 SHEET