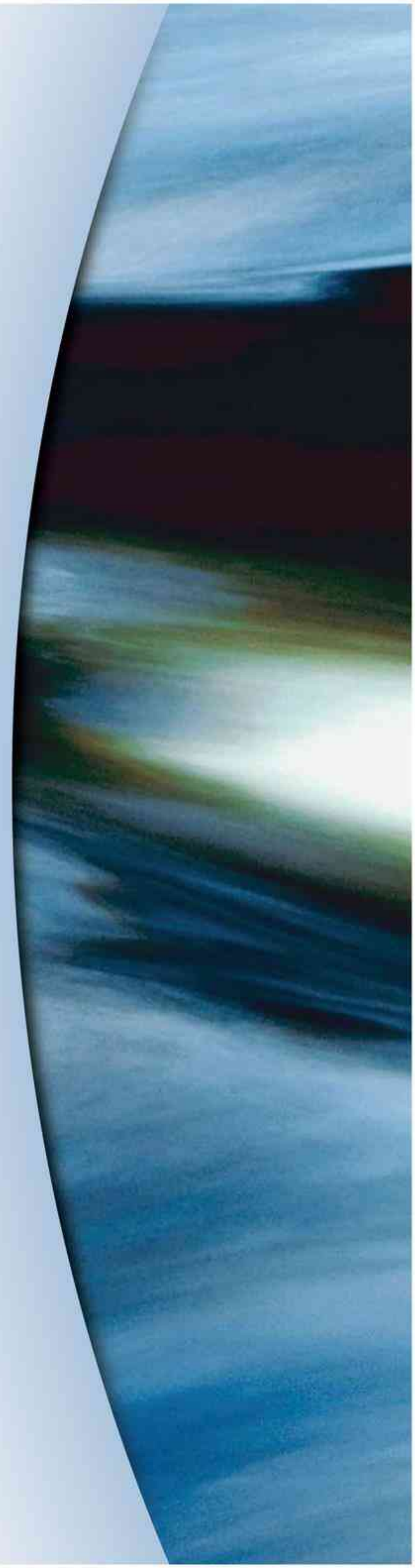

HYDROLOGY AND HYDRAULICS REPORT

VERANO-Rio Vista Village

TTM 38709 & 38710

Cathedral City, CA

Prepared For
NCP Verano, LLC
690 E Green Street, Suite 200
Pasadena, CA 91101
ph.(323) 874-8000

Prepared By

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Project Manager:
Steve Ellis, PE.

Date Prepared: June 2023
Revised 1 :
Job Number : 4090-01

full circle thinking®

HYDROLOGY AND HYDRAULICS REPORT

VERANO - RIO VISTA VILLAGE
TTM 38709 & 38710

City of Cathedral City, CA 92234
Riverside County

Prepared for:

NCP VERANO, LLC
690 E Green Street, Suite 200
Pasadena, CA 91101
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Prepared by:

FUSCOE ENGINEERING, INC.
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Tel. 909-581-0676

REGISTERED PROFESSIONAL ENGINEER
RAY P. ERILLO
NO. C 74963
EXP. 12/31/23

Date Prepared: June 2023
Revision 1 :
Revision 2 :

Table of Contents

1.0 INTRODUCTION

1.1 GEOGRAPHIC SETTING

The proposed Verano project will be part of the master planned community named Rio Vista Village at Cathedral City, California. This report focuses on the portion of the Verano project (herein known as the "project") that is located within Drainage area "D" as identified in the Rio Vista Village Master Plan Drainage Report Tract 28639-1 for Rio Vista Village, dated May 2001. The project encompasses TTM 38709 and TTM 38710. The total project site is approximately 12.84 acres with a net disturbed area of 12.84 acres. It is bounded by an empty lot to the north, Rio Guadalupe Rd to the west, Avenida Quintana to the east, and Rio Rosalia Dr to the south.

The project site is vacant and undeveloped under its existing conditions. Adjacent development surrounding the area site includes single family residences, a stormwater channel, and undeveloped areas. See Figure 1 below for the project location map.

There is no existing storm drain system on site. There are existing Retention Basins C and D located in between Rio Vista Dr that will be utilized for this project. The proposed project consists of the construction of various buildings, landscape areas, drive aisles, sidewalks, parking areas, wall, water quality BMPs and wet/dry utilities.

1.2 PURPOSE OF THIS REPORT

The purpose of this report is to accomplish the following objective:

To determine hydrologic impacts resulting from the proposed development. Impacts are determined based on the comparison between the pre-development condition and the post-development condition. This hydrology report will also provide the peak flow rates for 10-year and 100-year at 24hr duration for post development condition and determine if the proposed storm drain system will be sufficient to convey the runoff generated by the proposed improvements. 100yr-24Hr Storm frequency unit Hydrograph will be used to calculate the runoff volume generated at post condition. Post development condition will also utilize the pro-rated volume provided for the existing retention basin, D, as shown on the previously approved Master WQMP (M-WQMP) for Rio Vista Village. This will be considered in evaluating the peak flow rate after retention.

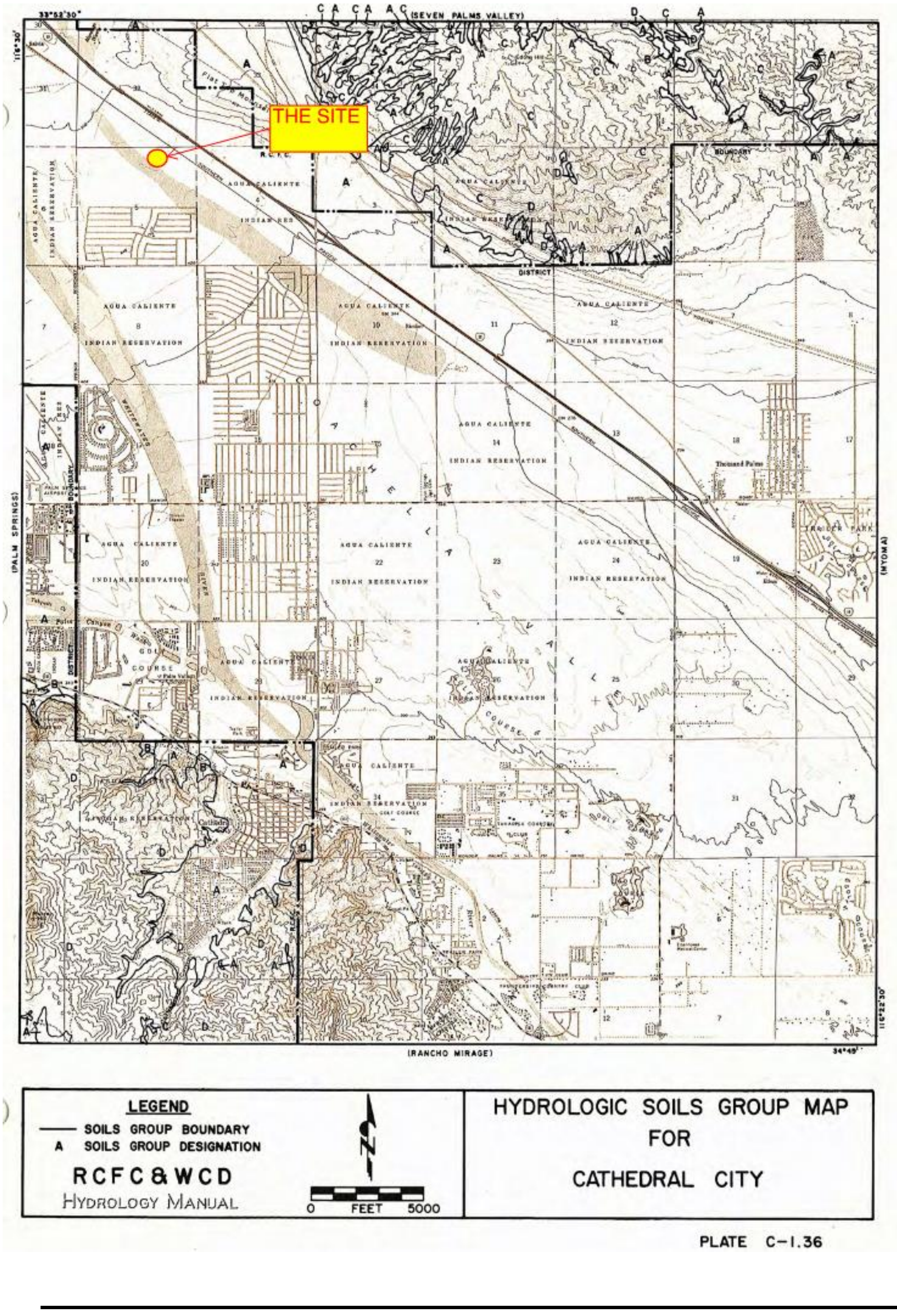
1.3 REFERENCES

- Riverside County Flood Control and Water Conservation District (RCFC & WCD) Hydrology Manual
- Approved Drainage Report, Tract 28639-1, Rio Vista Village report dated May 4, 2001

1.4 PROJECT SITE LOCATION MAP

Figure 1

1.5 HYDROLOGIC SOILS GROUP MAP FOR CATHEDRAL CITY



2.0 PRE-DEVELOPMENT CONDITION

2.1 PRE-DEVELOPMENT TOPOGRAPHY

The project site is vacant and undeveloped under existing conditions. Adjacent land uses include single family residences and undeveloped property. The pre-development drainage area is approximately 12.84 acres. The overall property moderately slopes downward to the southerly direction towards the existing retention basins.

2.2 PRE-DEVELOPMENT DRAINAGE SYSTEM

The existing site is an undeveloped property with no storm drain system within the site. The project site is located within Drainage area "D" as identified in the Rio Vista Village Master Plan Drainage Report Tract 28639-1 for Rio Vista Village, dated May 2001. The storm runoff from the site sheet flows towards the southerly direction to the existing retention basin "D" located between Rio Vista Drive. These runoffs will be part of the Whitewater watershed area which will drain to Whitewater River then to the Coachella Valley Storm Water Channel.

3.0 POST DEVELOPMENT CONDITION

3.1 POST DEVELOPMENT

The proposed development includes single-family residences, landscape areas, parking lots, and drive aisles. This proposed development will increase the impervious area of the site to 65%. The post-development drainage area for this development is approximately 12.84 acres. This development will utilize the existing Retention Basin D for treatment control as well as to address flood control requirements. Per the M-WQMP, the Retention Basin "D" was designed with the capacity to retain for the 100-year, 24-hour storm event. This means the design of the existing basins exceed the current NPDES WQMP requirements per Cathedral City Municipal Code Title 8 § 8.24.070 requiring a minimum storage for 100yr-3Hr duration storm event. The Autodesk Civil3D Hydraflow Unit Hydrograph and RCFC & WCD data was utilized to calculate this. Runoff from the proposed development site will sheet flow through the curb and gutters to 3 locations and then to the on-site storm drain system and eventually to the existing retention basin D.

In addition, the improvements will also include installation of appropriate drainage facilities, other dry and wet utilities, and LID BMPs to mitigate water quality objectives.

3.2 PROPOSED DRAINAGE FACILITY

This post development condition will have three drainage areas as shown on the Post Development Drainage Maps. Drainage areas P-A, P-B and P-C will drain to three respective locations and then to the existing storm drain systems which will ultimately flow towards the existing Retention Basin "D". Discharge peak flow rates will be calculated per 100yr-24hr storm event. The capacity of the street and catch basins will also be designed per 100-yr storm event. Proposed development must also peak flow rate must not exceed pre-development condition at 100yr-24h4 storm frequency. This will be achieved by the utilization of the existing retention basins.

Proposed drainage structures and pipes are shown in the Hydrology Maps in Appendix 5.

4.0 HYDROLOGY AND HYDRAULIC STUDY

4.1 METHODOLOGY

This study was prepared in conformance with the Riverside County Hydrology Manual. Autodesk Civil3D Hydraflow Unit Hydrograph Calculator with the rainfall intensity and precipitation data from RCFC & WCD was used to determine the hydrograph volume based on 100-year, 24hr storm duration. Soil type "A" was used for the site per the RCFC & WCD Hydrologic Soil Map for Cathedral City (Plate C-1.36) Methodology and supportive data for the hydrologic calculations may be found in this report, and in the "Riverside County Flood Control and Water Conservation District Hydrology Manual".

The results of the analysis are included in this report in Appendix 2 and 4.

5.0 RESULTS AND CONCLUSIONS

The purpose of this drainage analysis is to identify the need to keep the post-development runoff volume and peak flow rate the same as the pre-development condition by utilizing the existing retention basin. Riverside County Flood Control District and Water Conservation District requires that the difference in runoff hydrograph volume between the "post-developed" condition and the "pre-developed" condition for the 100hr-24hr storm frequency must be detained on-site. The rainfall volume for the pre-developed condition is 55, 837 C.F. for drainage area EX-A. The post developed rainfall volume is 95,590 C.F. for drainage area P-A. Hence, the difference in pre and post developed runoff volume is 39,753 C.F. Meanwhile, per the M-WQMP the pro-rated volume provided by the existing retention basin was calculated to be 51,183 C.F. for Retention Basin D, which is adequate to meet flood control requirements. Furthermore, it was noted that the pre-development peak flow was 7.98 cfs, compared to the total post-development peak flow of 17.32 cfs at 100yr-24hr storm frequency. Lastly, it has been determined that the proposed storm drain system can convey runoff generated at 100-year storm events. Therefore, the proposed development meets the WQMP and flood requirements for this project and will not result in an adverse effect to the community.

EXISTING CONDITIONS 10YR-24HR & 100YR-24HR STORM EVENT

ID	Area (acre)	Tc, min	Q10 (cfs)	Q100 (cfs)
EX-A	12.84	55.6	0.91	7.98
TOTAL	**12.84**			

PROPOSED CONDITIONS 10YR-24HR & 100YR-24HR STORM EVENT

ID	Area (acre)	Tc, min	Q10 (cfs)	Q100 (cfs)
P-A	0.46	11.5	0.40	1.36
P-B	7.29	57.1	2.37	8.63
P-C	5.09	41.2	2.02	7.33
TOTAL	**12.84**		**4.79**	**17.32**

REQUIRED STORAGE USING UNIT HYDROGRAPH:

(100 YR-24HR)	Runoff Volume	Remarks
Pre-Development Condition	55,837 cu. ft.	
Post Development Condition	95,590 cu. ft.	
DIFFERENCE – PRE vs POST CONDITION	**39,753** cu. ft.	
TOTAL PROVIDED STORAGE RETENTION BASIN D – (PER M-WQMP FOR RIO VISTA VILLAGE: 100YR-24HR)	**2.42 Ac-ft** **105,415 cu. ft.**	
*** PRO-RATED VOLUME STORAGE AT RETENTION BASIN D PER M-WQMP FOR RIO VISTA VILLAGE**	**51,183 cu. ft.**	**Adequate**

PRE VS POST DEVELOPMENT CONDITION AFTER RETENTION (100YR-24HR)

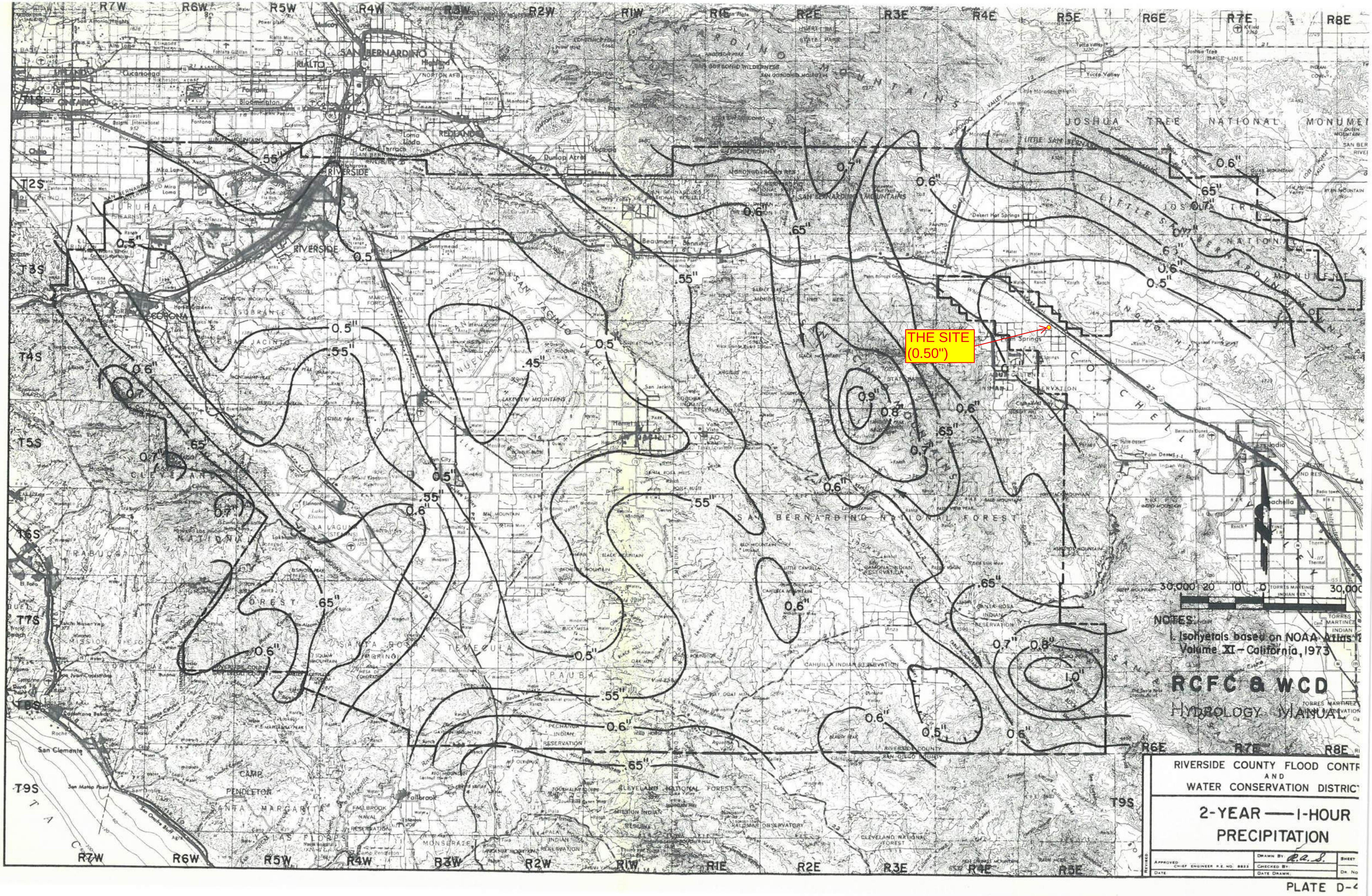
PRE-CONSTRUCTION VS POST-CONSTRUCTION FLOW SUMMURY BEFORE AND AFTER RETENTION					
Discharge Location	**Total Pre-Development Flow Rate, Q100**	**Total Post-Development Flow Rate (No Retention), Q100**	**Pro-rated Retention Volume Provided**	**Total Post-Development Flow Rate (After Retention), Q100**	**Conclusion**
Existing Retention Basin D	**7.98 cfs**	**17.32 cfs**	**51,183 cu.ft.**	**3.46 cfs**	**Post development flow decreased.**

6.0 APPENDICES

Appendix 1	*Riverside County Flood Control Hydrology Manual Excepts.*
Appendix 2	*Unit Hydrograph: Pre and Post Development Conditions for 10yr- and 100yr-24Hr*
Appendix 3	*RCFC & WCD Hydrologic Soil Map (Plate C-1.36)*
Appendix 4	*Autodesk CIVIL3D Hydraflow Unit Hydrograph Calculations (STORAGE) 100yr-24Hr*
Appendix 5	*Hydrology Maps-Pre and Post Development Hydrology Map/ SD-Catch Basin Exhibit*
Appendix 6	*Excerpts from Approved Master Drainage Report for Tract 28639-1- Rio Vista Village dated May 4, 2001 (For Reference Only)*
Appendix 7	*Supporting Documents*

APPENDIX 1

RIVERSIDE COUNTY FLOOD CONTROL HYDROLOGY MANUAL EXCEPTS.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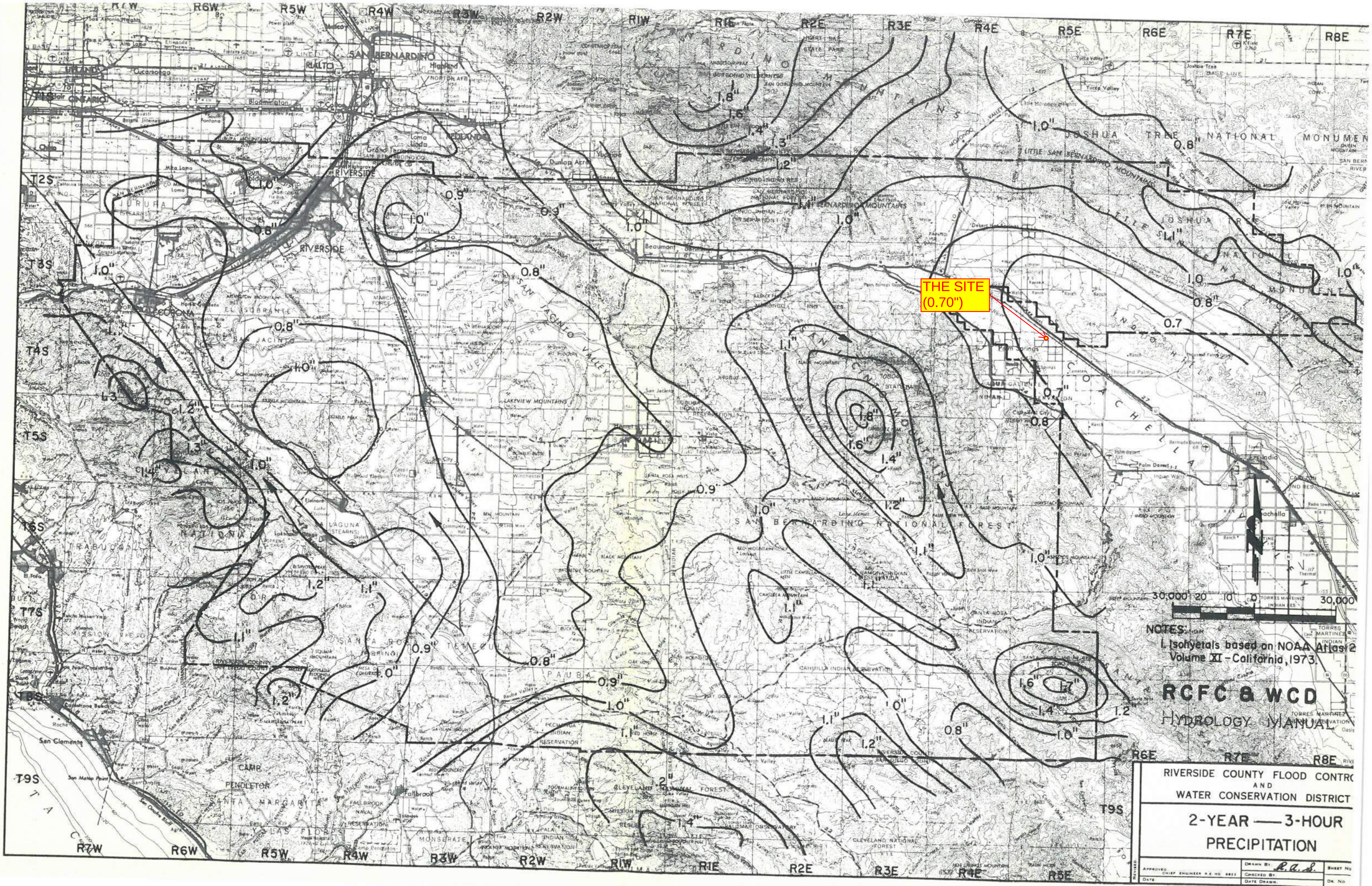
NOTES:
1. Isohyetals based on NOAA Atlas 2
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4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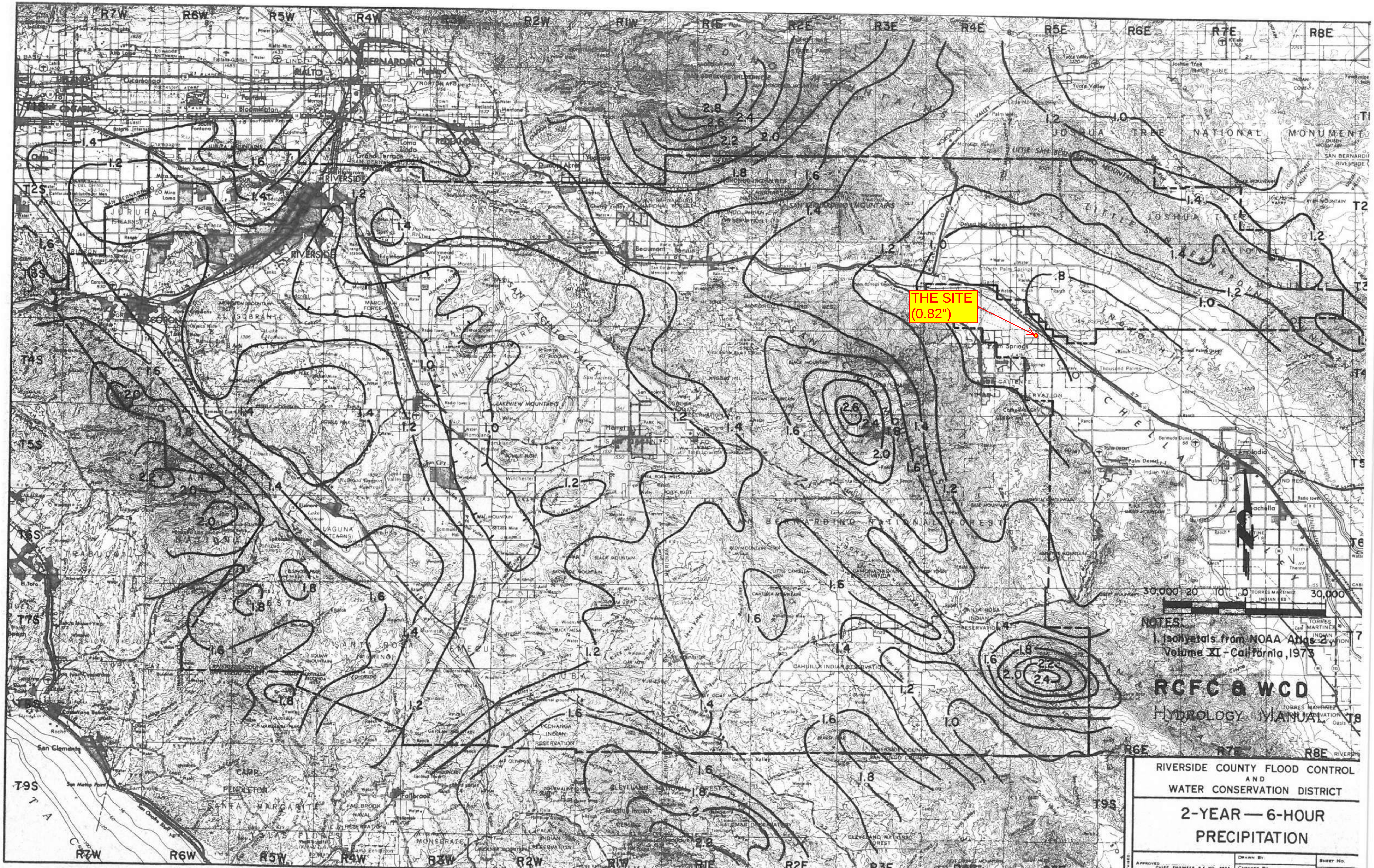
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTRO
AND
WATER CONSERVATION DISTRICT
2-YEAR — 3-HOUR
PRECIPITATION
30,000 20 10 0 30,000
SAN BERNARDINO
RIVERSIDE
CORONA
Palm Springs
SAN BERNARDINO NATIONAL FOREST
JOSHUA TREE NATIONAL MONUMENT
COACHELLA
TEMECULA

PLATE E-5.1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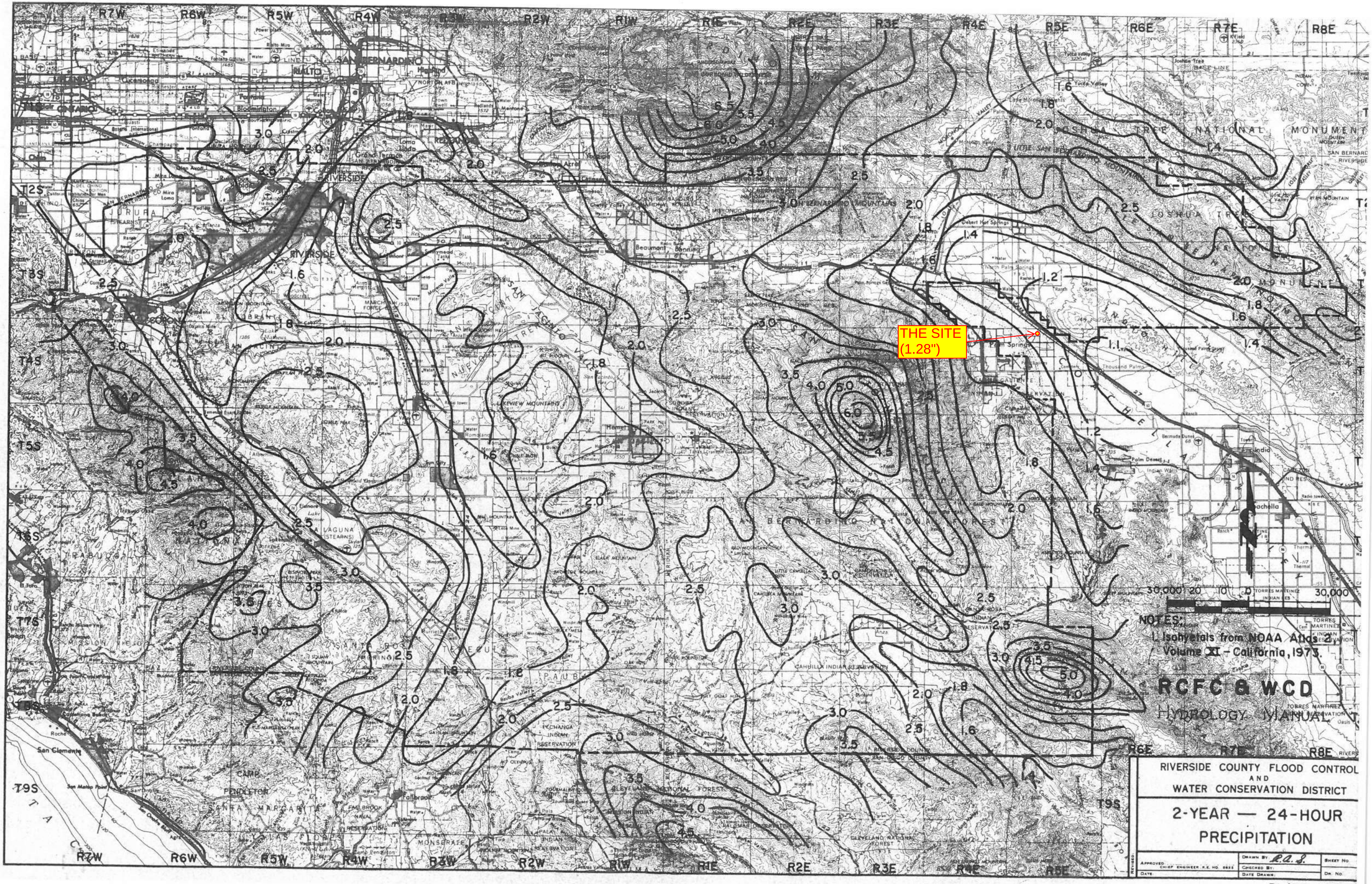
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
SAN BERNARDINO
RIVERSIDE
Palm Springs
Palm Desert
Indio
Coachella
San Clemente
Fallbrook
Hemet
Beaumont
Banning

PLATE E-5.3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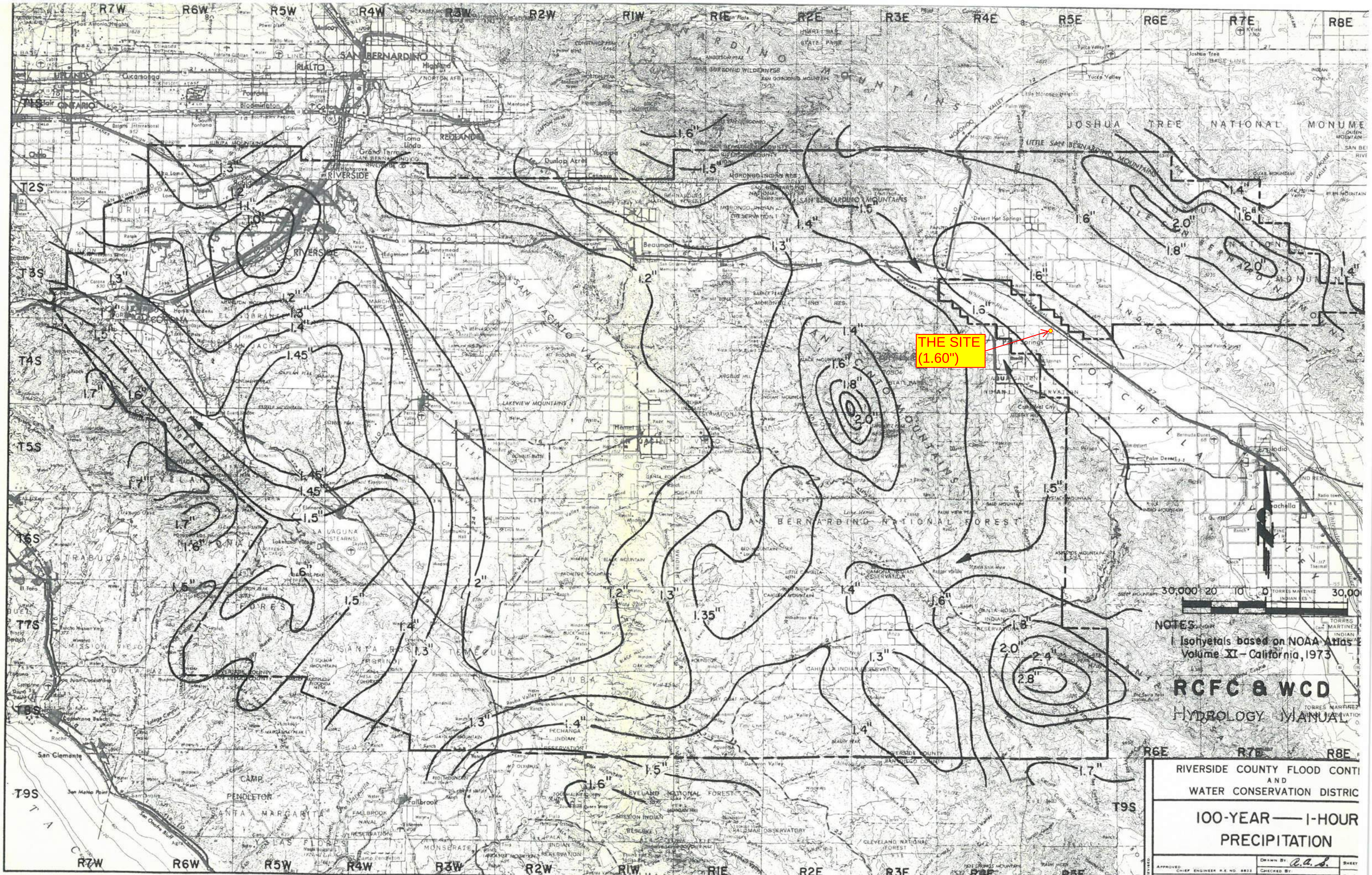
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR
PRECIPITATION
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
SAN BERNARDINO
RIVERSIDE
Palm Springs
Palm Desert
Indio
Coachella
Hemet
Fallbrook
San Clemente

PLATE E-5.5


THE SITE
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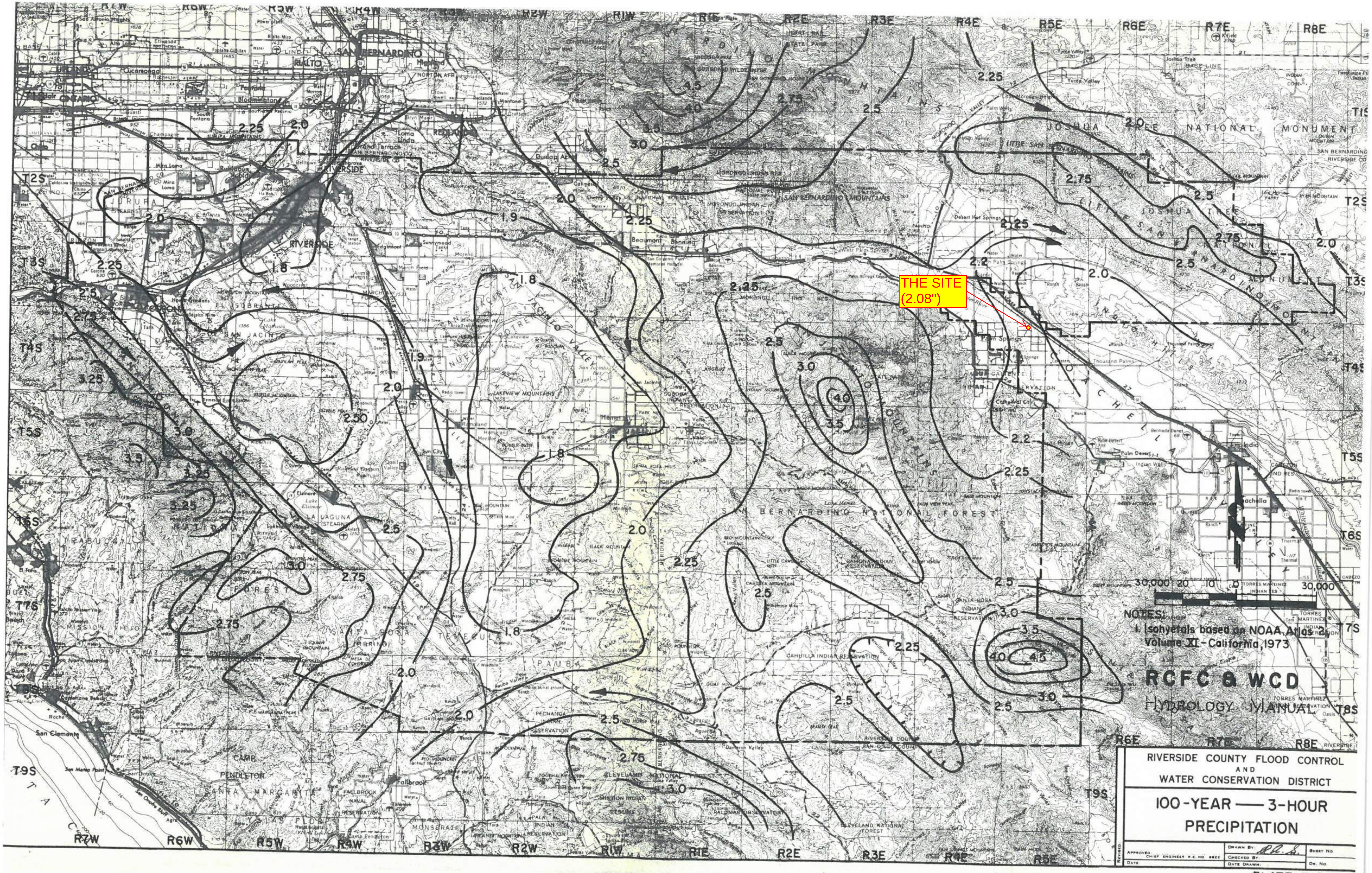
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
SAN BERNARDINO MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
SAN JACINTO MOUNTAINS
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
COACHELLA
RIVERSIDE
SAN BERNARDINO
REDLANDS
TEMECULA
SANTA ROSA
PAUBA
SANTA MARGARITA
PENDLETON
MISSION VIEJO
TRABUCO
ELSINORE
PERRIS
HEMET
BEAUMONT
Palm Springs
Palm Desert
Indio
Fallbrook
San Clemente
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S
30,000 20 10 0 30,000

PLATE D-4


THE SITE
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RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION
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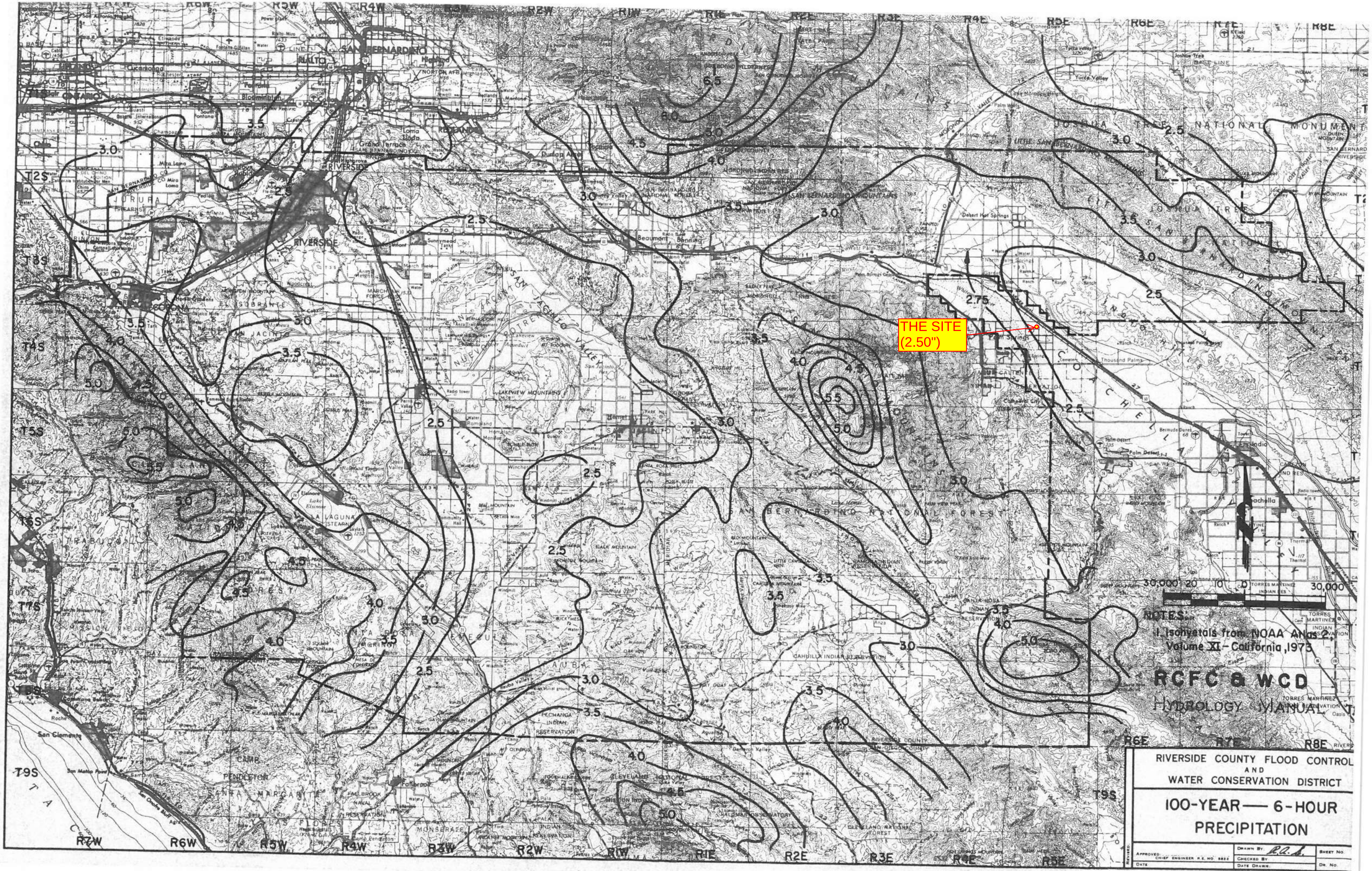
RCFC & WCD
HYDROLOGY MANUAL
SAN BERNARDINO NATIONAL FOREST
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO MOUNTAINS
RIVERSIDE
SAN BERNARDINO
Beaumont
Banning
Hemet
Indio
Coachella
Palm Springs
Palm Desert
Cathedral City
Desert Hot Springs
Thousand Palms
San Clemente
Fallbrook
CAMP PENDLETON
30,000 20 10 0 30,000

PLATE E-5.2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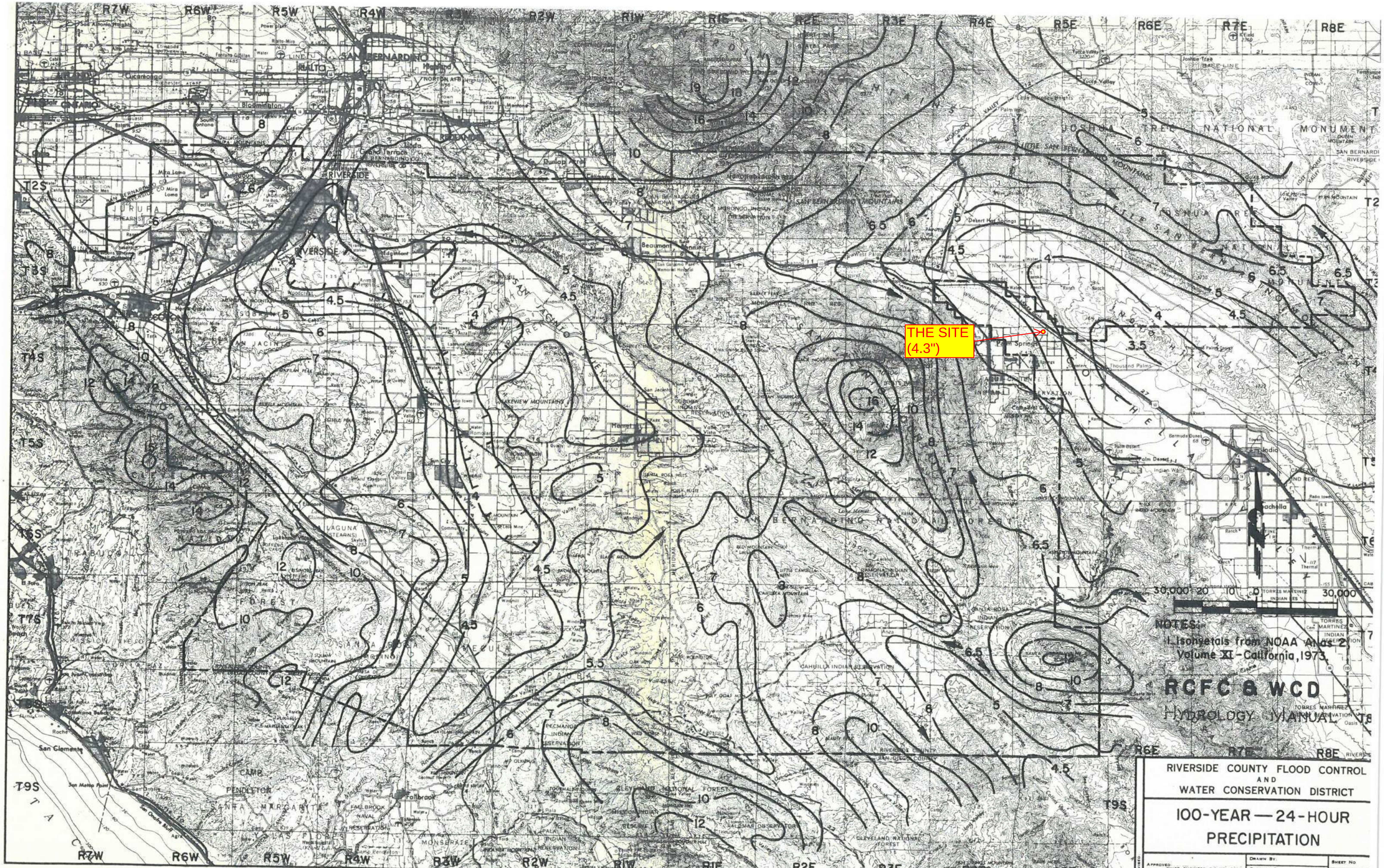
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR
PRECIPITATION
30,000 20 10 0 30,000

PLATE E-5.4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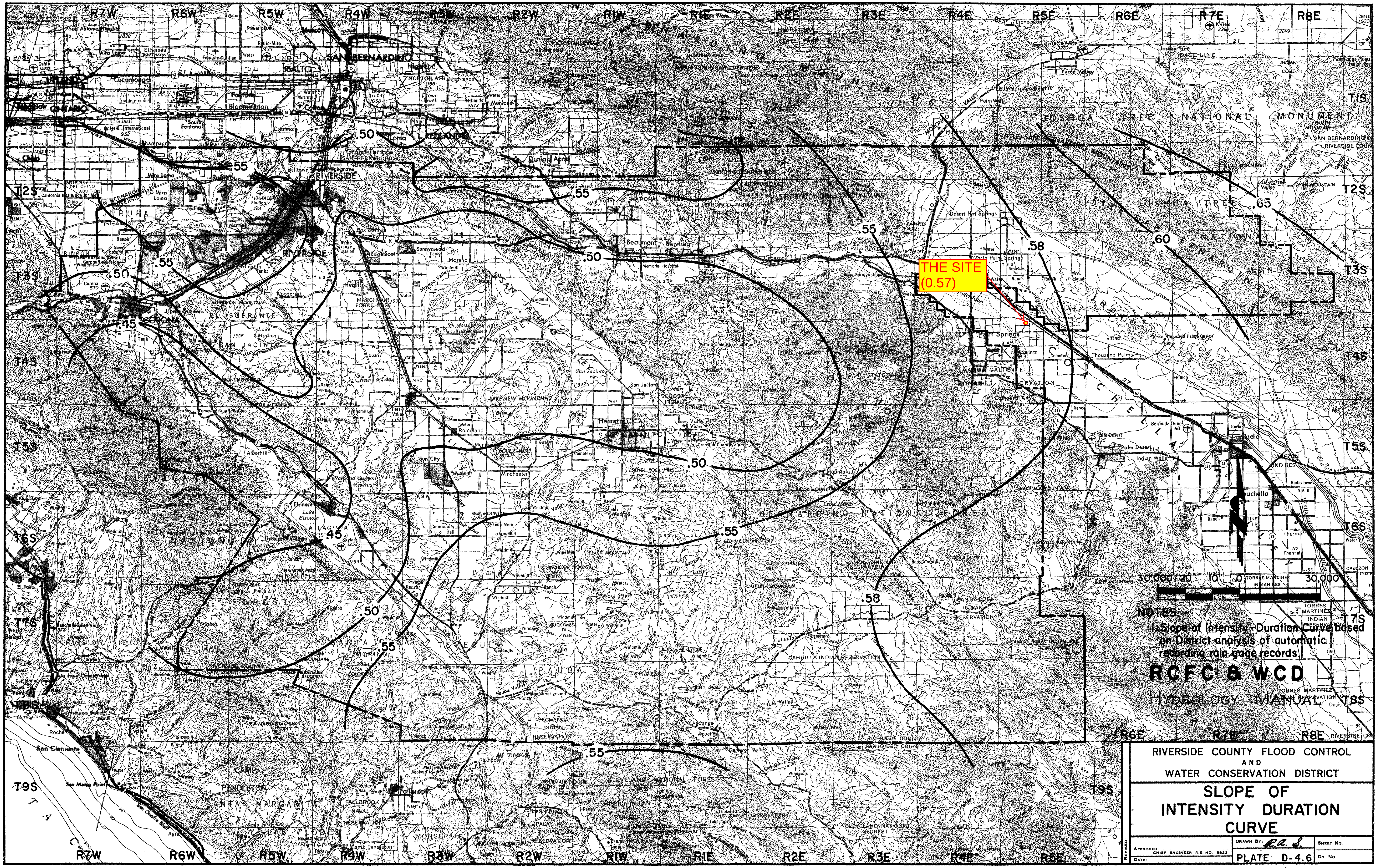
Volume XI - California, 1973.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
SAN BERNARDINO
RIVERSIDE
Palm Springs
Beaumont
Hemet
Indio
Coachella
San Clemente
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S

PLATE E-5.6


THE SITE
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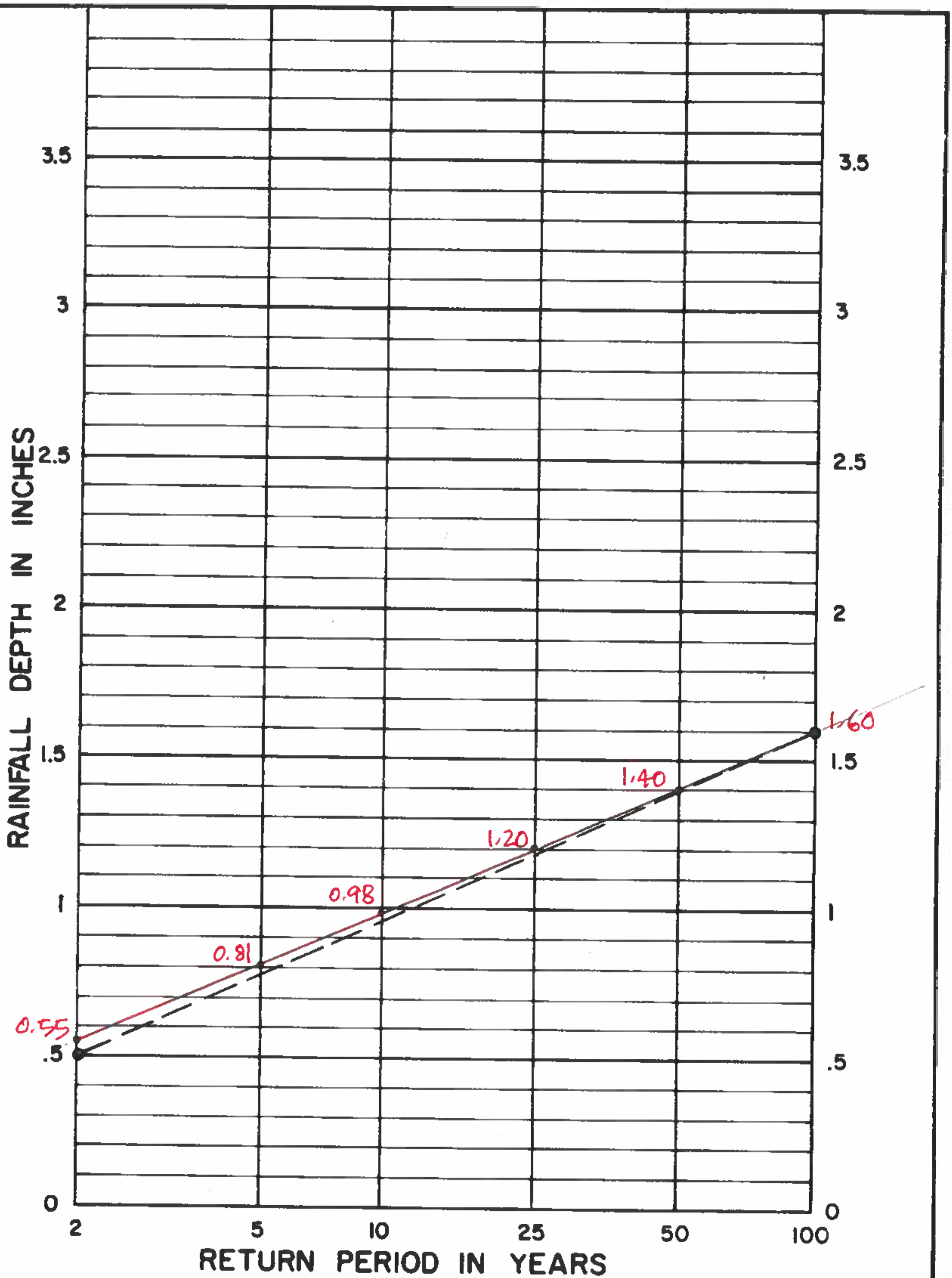
NOTES:
1. Slope of Intensity-Duration Curve based on District analysis of automatic recording rain gage records.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SLOPE OF
INTENSITY DURATION
CURVE
PLATE D-4.6
.45
.50
.55
.58
.60
.65
SAN BERNARDINO
RIVERSIDE
PALM SPRINGS
JOSHUA TREE NATIONAL MONUMENT
SAN JACINTO MOUNTAINS
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST



NOTE:

1. For intermediate return periods plot 2-year and 100-year one hour values from maps, then connect points and read value for desired return period. For example given 2-year one hour = .50" and 100-year one hour = 1.60", 25-year one hour = 1.18"

Reference: NOAA Atlas 2, Volume XI-California, 1973.

RCFC & WCD

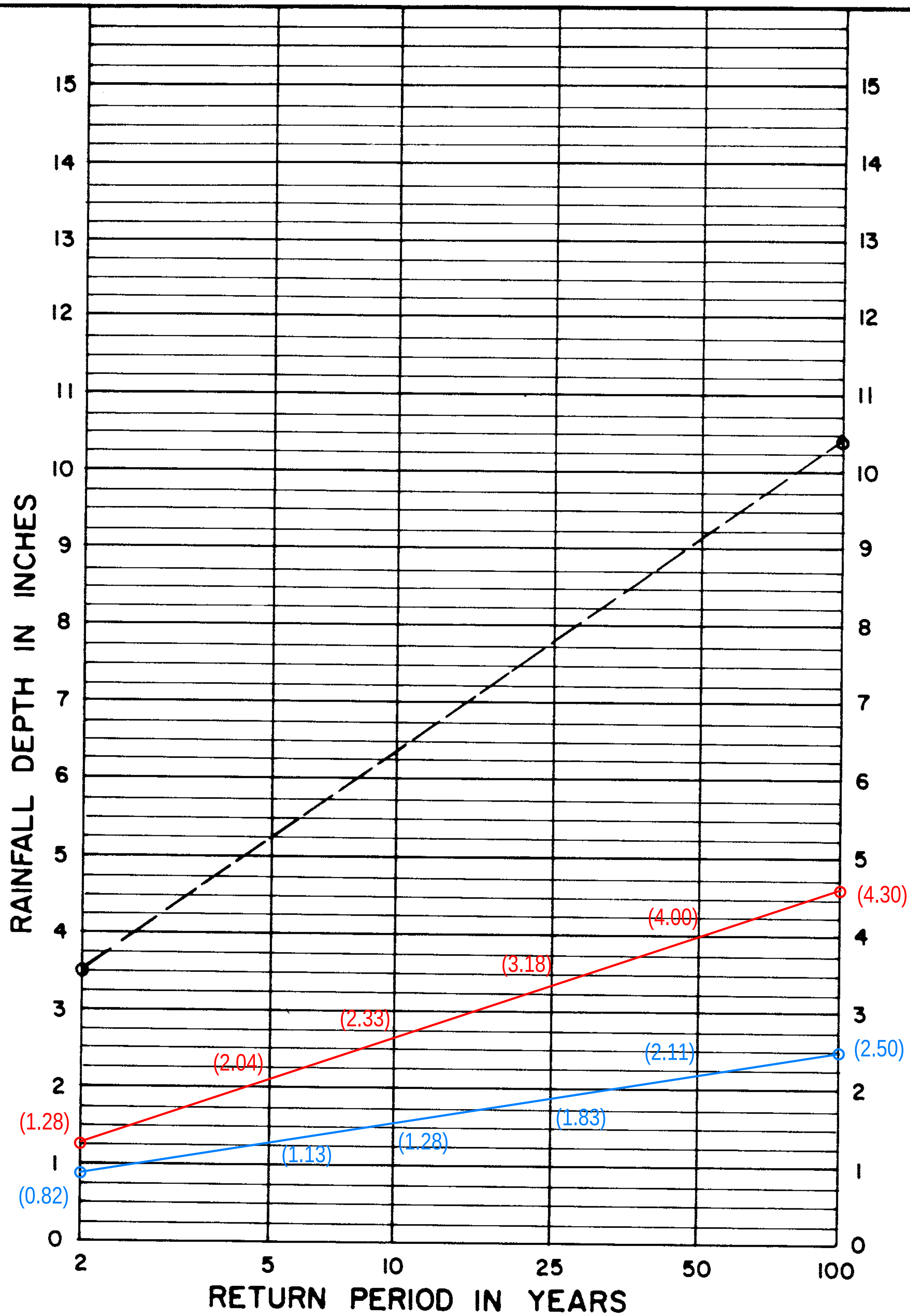
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

VERANO - CATHEDRAL CITY, CA

(ONE HOUR VALUES)

PLATE D-4.5



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA Atlas 2, Volume XI - California, 1973.

RCFC & WCD

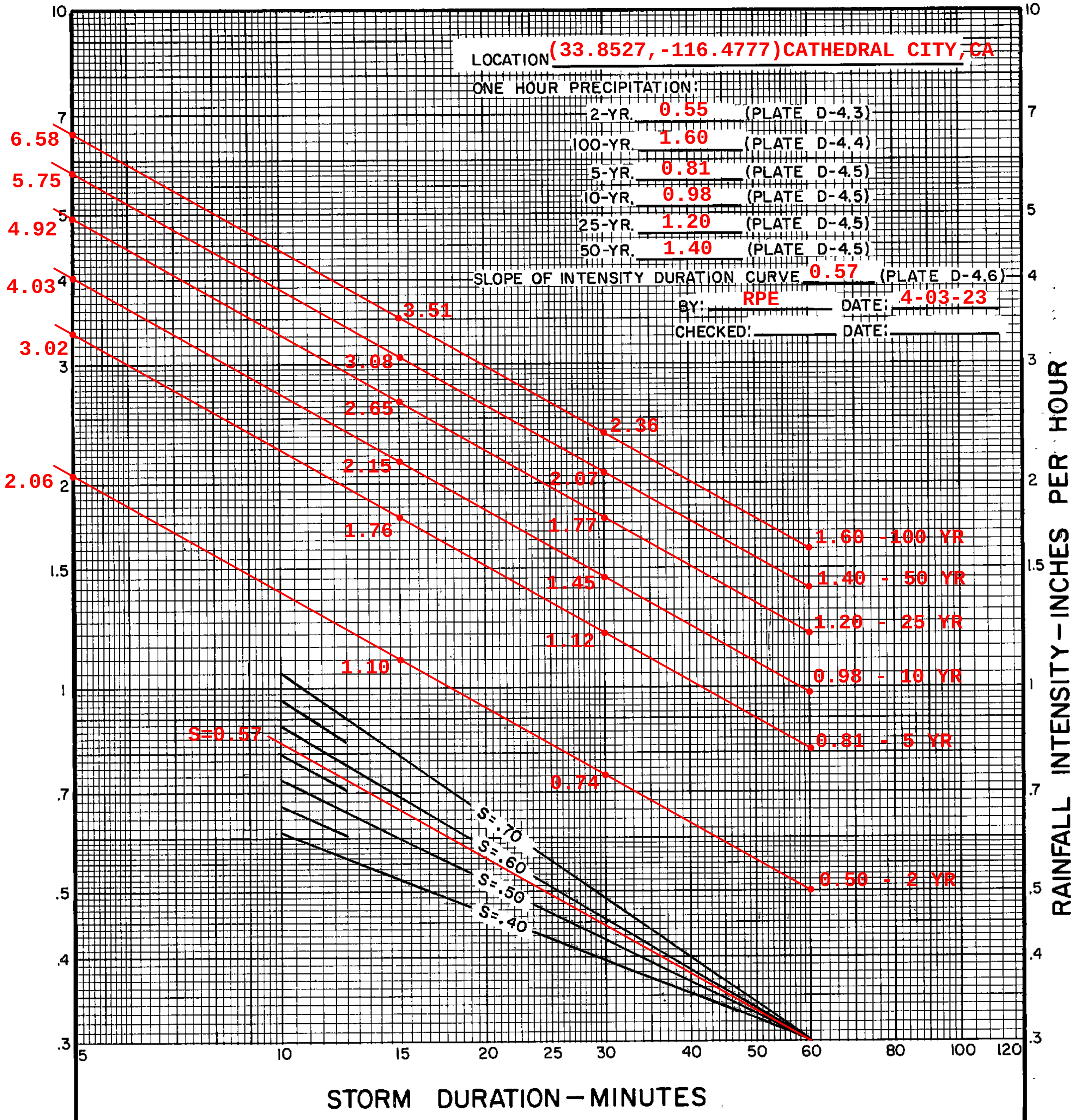
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

VERANO-CATHEDRAL CITY, CA (24-HOUR VALUES)

(6-HOUR VALUES)

PLATE E-5.7



RCFC & WCD

HYDROLOGY MANUAL

INTENSITY—DURATION CURVES CALCULATION SHEET

RAINFALL INTENSITY-INCHES PER HOUR

CATHEDRAL CITY			CHERRY VALLEY			CORONA			DESERT HOT SPRINGS			ELSINORE - WILDOMAR		
DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	4.14	6.76	5	3.65	5.49	5	3.10	4.78	5	4.39	6.76	5	3.23	4.94
6	3.73	6.08	6	3.30	4.97	6	2.84	4.38	6	3.95	6.08	6	2.96	4.53
7	3.41	5.56	7	3.03	4.56	7	2.64	4.07	7	3.62	5.56	7	2.75	4.21
8	3.15	5.15	8	2.82	4.24	8	2.47	3.81	8	3.35	5.15	8	2.58	3.95
9	2.95	4.81	9	2.64	3.97	9	2.34	3.60	9	3.13	4.81	9	2.44	3.73
10	2.77	4.52	10	2.49	3.75	10	2.22	3.43	10	2.94	4.52	10	2.32	3.54
11	2.62	4.28	11	2.36	3.56	11	2.12	3.27	11	2.78	4.28	11	2.21	3.39
12	2.49	4.07	12	2.25	3.39	12	2.04	3.14	12	2.65	4.07	12	2.12	3.25
13	2.38	3.88	13	2.16	3.25	13	1.96	3.02	13	2.53	3.88	13	2.04	3.13
14	2.28	3.72	14	2.07	3.12	14	1.89	2.92	14	2.42	3.72	14	1.97	3.02
15	2.19	3.58	15	1.99	3.00	15	1.83	2.82	15	2.32	3.58	15	1.91	2.92
16	2.11	3.44	16	1.92	2.90	16	1.77	2.73	16	2.24	3.44	16	1.85	2.83
17	2.04	3.32	17	1.86	2.80	17	1.72	2.66	17	2.16	3.32	17	1.80	2.75
18	1.97	3.22	18	1.80	2.71	18	1.68	2.58	18	2.09	3.22	18	1.75	2.67
19	1.91	3.12	19	1.75	2.64	19	1.63	2.52	19	2.03	3.12	19	1.70	2.60
20	1.85	3.03	20	1.70	2.56	20	1.59	2.46	20	1.97	3.03	20	1.66	2.54
22	1.75	2.86	22	1.61	2.43	22	1.52	2.35	22	1.86	2.86	22	1.59	2.43
24	1.67	2.72	24	1.54	2.32	24	1.46	2.25	24	1.77	2.72	24	1.52	2.33
26	1.59	2.60	26	1.47	2.22	26	1.40	2.17	26	1.69	2.60	26	1.46	2.24
28	1.52	2.49	28	1.41	2.13	28	1.36	2.09	28	1.62	2.49	28	1.41	2.16
30	1.46	2.39	30	1.36	2.05	30	1.31	2.02	30	1.55	2.39	30	1.37	2.09
32	1.41	2.30	32	1.31	1.98	32	1.27	1.96	32	1.50	2.30	32	1.33	2.03
34	1.36	2.22	34	1.27	1.91	34	1.23	1.90	34	1.45	2.22	34	1.29	1.97
36	1.32	2.15	36	1.23	1.85	36	1.20	1.85	36	1.40	2.15	36	1.25	1.92
38	1.28	2.09	38	1.20	1.80	38	1.17	1.81	38	1.36	2.09	38	1.22	1.87
40	1.24	2.02	40	1.16	1.75	40	1.14	1.76	40	1.32	2.02	40	1.19	1.82
45	1.16	1.89	45	1.09	1.64	45	1.08	1.66	45	1.23	1.89	45	1.13	1.72
50	1.09	1.78	50	1.03	1.55	50	1.03	1.58	50	1.16	1.78	50	1.07	1.64
55	1.03	1.68	55	.99	1.47	55	.98	1.51	55	1.09	1.68	55	1.02	1.56
60	.98	1.60	60	.93	1.40	60	.94	1.45	60	1.04	1.60	60	.98	1.50
65	.94	1.53	65	.89	1.34	65	.90	1.40	65	.99	1.53	65	.94	1.44
70	.90	1.46	70	.85	1.29	70	.87	1.35	70	.95	1.46	70	.91	1.39
75	.86	1.41	75	.82	1.24	75	.84	1.30	75	.91	1.41	75	.88	1.35
80	.83	1.35	80	.79	1.20	80	.82	1.26	80	.88	1.35	80	.85	1.31
85	.80	1.31	85	.77	1.16	85	.80	1.23	85	.85	1.31	85	.83	1.27
SLOPE = .580			SLOPE = .550			SLOPE = .480			SLOPE = .580			SLOPE = .480		

RCFC & WCD

HYDROLOGY MANUAL

STANDARD
INTENSITY-DURATION
CURVES DATA

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD
HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

Local land use authority	Ordinance	Requirement
Coachella	Ordinance #1014 Municipal Code Section 13.16.110	To minimize the discharge and transport of pollutants, the city requires all new development and redevelopment projects identified as a Priority Project under the newly implemented NPDES permit No. CAS617002 to retain 100% of the stormwater from the 100 year, 24-hour duration storm in order to prevent any deterioration of the water quality which would impair the subsequent or competing uses of water. Projects that retain and infiltrate 100% of the rainfall conditions specified in Section F.1.c.v.4 of the NPDES permit are deemed to comply with the Treatment Control BMP requirements found in that section of the NPDES permit. The NPDES permit establishes acceptable methods and standards for controlling stormwater runoff volumes, rates, and pollutant loading including but not limited to the following: A. Increase Permeable Areas, Avoid placing impervious surfaces in highly porous soil areas; incorporate landscaping and open space into the project design; use porous materials for or near driveways and walkways; incorporate retention basins that can infiltrate Stormwater onsite; and avoid placing pavement and other impervious surfaces in low lying areas. B. Direct Runoff to Permeable Areas. Direct Stormwater runoff away from impermeable areas to swales, berms, green strip filters, gravel beds, and French drains; install rain gutters and orient them toward permeable areas; modify the grade of the property to divert flow to permeable areas and minimize the amount of stormwater runoff leaving the property and when designing curbs, berms and other structures, avoid designs which isolate permeable or landscaped areas. C. Maximize Stormwater Storage for Reuse. Use retention structures, surface areas, cisterns, or other structures to store stormwater
Cathedral City	Municipal Code – Title 8 § 8.24.070	A. Except as noted below, development of all land within the city must include provisions for the management of stormwater runoff from the property which is to be developed. This management shall consist of constructing stormwater storage facilities, which includes detention basins. As a minimum, all development will make provisions to store runoff from rainfall events up to and including the one-hundred-year, three-hour duration event. If a suitable outlet for a detention basin is not available, or if engineering analysis indicates that available outlet systems would be overtaxed by detention basin outflow, a retention basin shall be constructed in lieu of a detention basin. B. The requirement for construction of a detention basin or a retention basin may be waived in the following cases: 1. The runoff has been included in a storage facility at another location. This may include storage facilities proposed as part of the Cathedral City Storm Drain Master Plan; 2. An application for a building permit to construct a single-family residential structure; 3. Development which will drain directly into a floodway or watercourse drainage channel which has been determined by the project review manager, using engineering analyses provided by the development, to have the capacity and be constructed to handle the additional runoff flow without increasing the potential for flood damage on any other downstream property. 4. Development of a parcel under one-half acre in an area where it can be demonstrated by engineering analyses that no significant increase in the potential for flood damage will be created by the development.

APPENDIX 2

UNIT HYDROGRAPH: PRE AND POST DEVELOPMENT CONDITIONS, 10YR- AND 100YR-24HR

<u>UNIT HYDROGRAPH</u>
PRE-DEVELOPMENT 10YR- AND 100YR-24HR

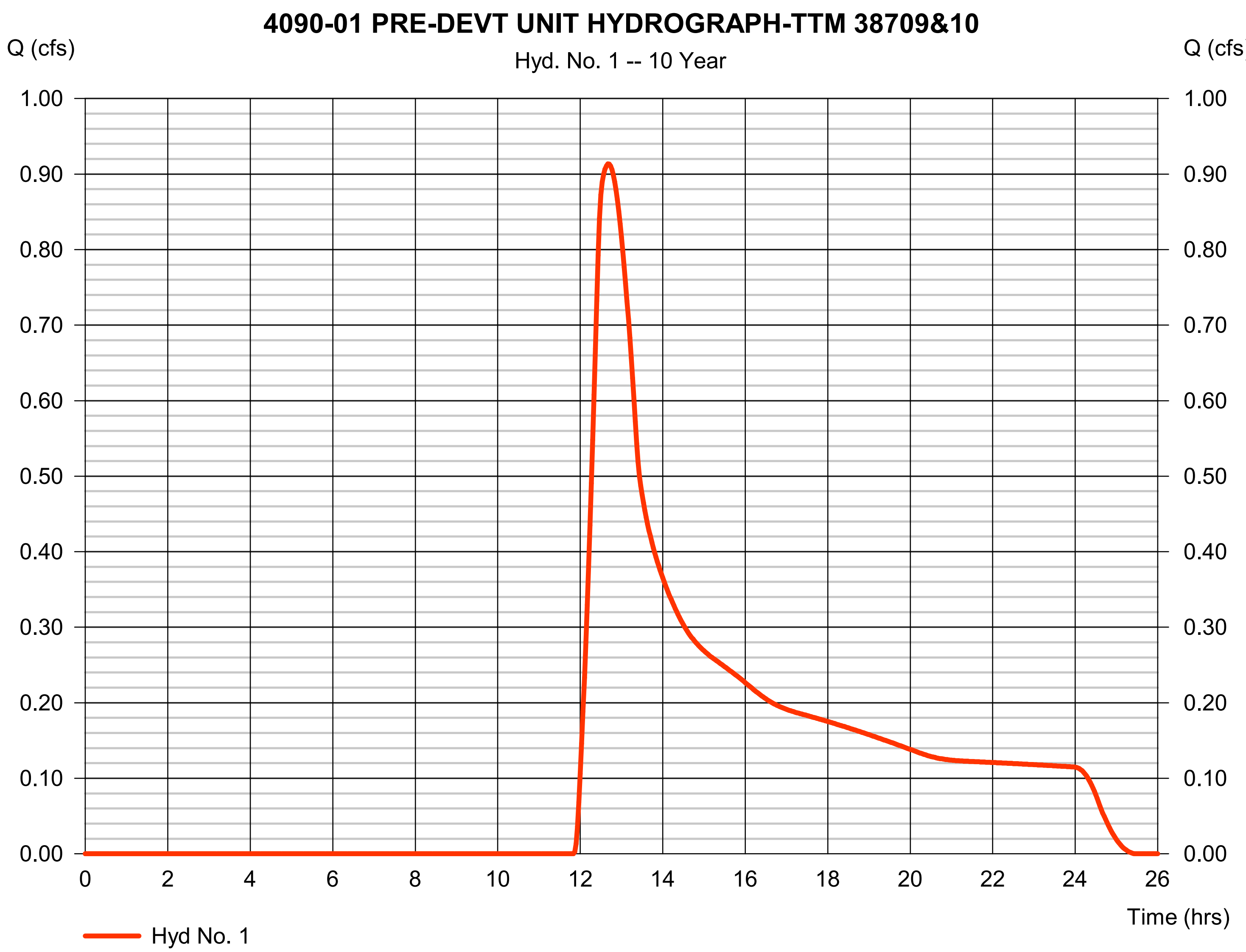
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 1

4090-01 PRE-DEVT UNIT HYDROGRAPH-TTM 38709&10

Hydrograph type	= SCS Runoff	Peak discharge	= 0.913 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.67 hrs
Time interval	= 2 min	Hyd. volume	= 10,943 cuft
Drainage area	= 12.840 ac	Curve number	= 65
Basin Slope	= 1.0 %	Hydraulic length	= 1195 ft
Tc method	= LAG	Time of conc. (Tc)	= 55.65 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



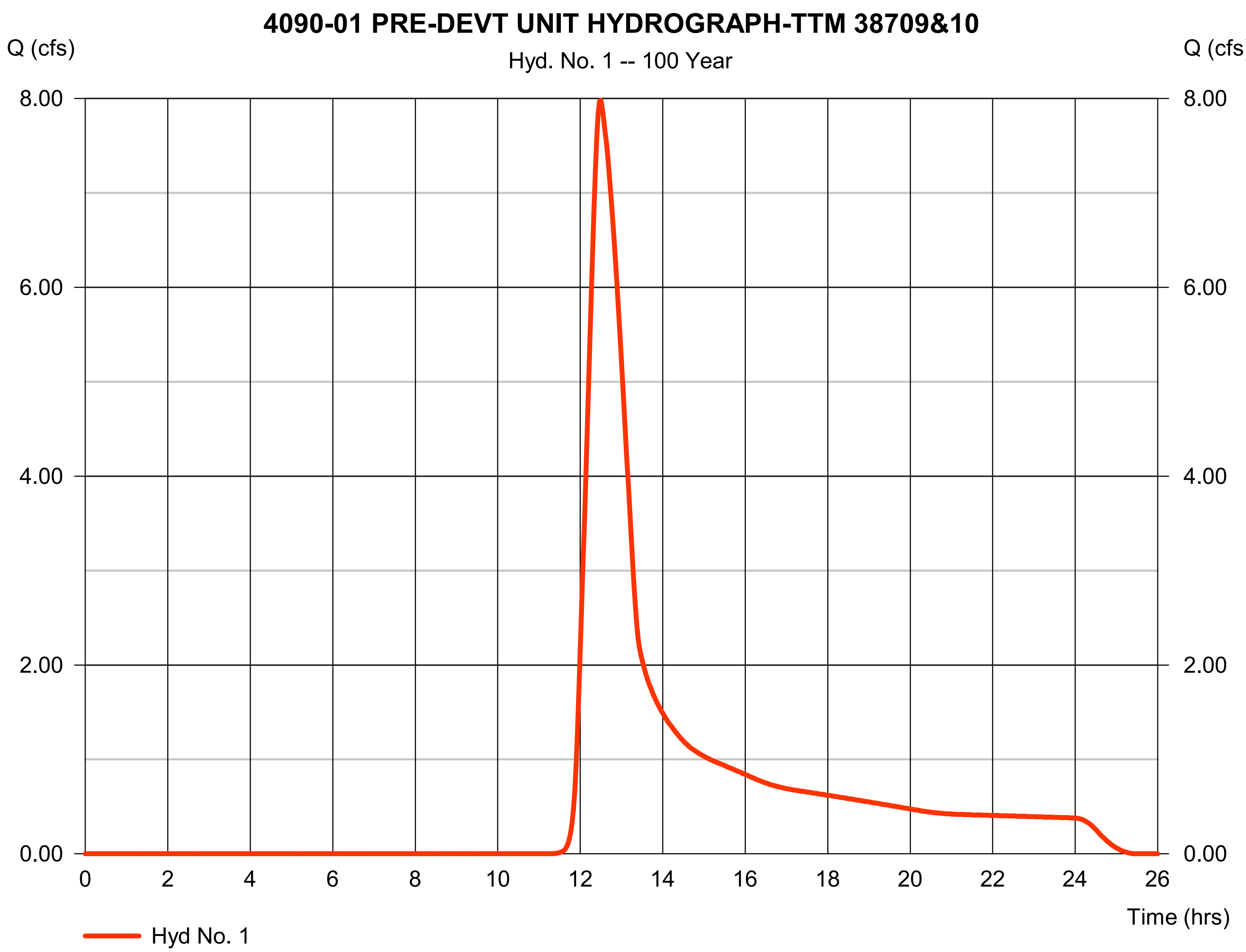
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 1

4090-01 PRE-DEVT UNIT HYDROGRAPH-TTM 38709&10

Hydrograph type	= SCS Runoff	Peak discharge	= 7.980 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.50 hrs
Time interval	= 2 min	Hyd. volume	= 55,837 cuft
Drainage area	= 12.840 ac	Curve number	= 65
Basin Slope	= 1.0 %	Hydraulic length	= 1195 ft
Tc method	= LAG	Time of conc. (Tc)	= 55.65 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38709 & 38710\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

UNIT HYDROGRAPH
POST-DEVELOPMENT 10YR- AND 100YR-24HR

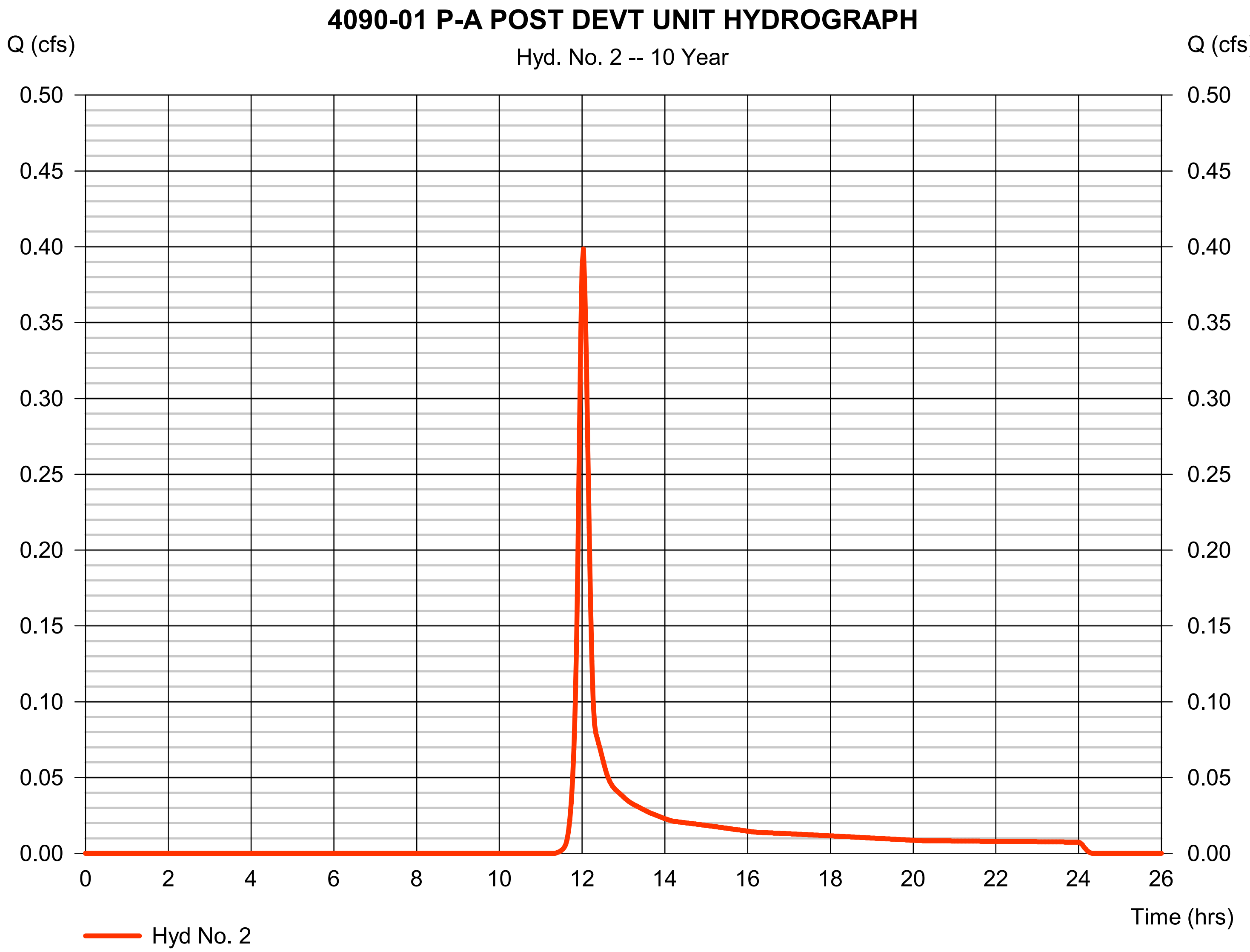
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 2

4090-01 P-A POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.399 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 1,095 cuft
Drainage area	= 0.460 ac	Curve number	= 77
Basin Slope	= 1.5 %	Hydraulic length	= 316 ft
Tc method	= LAG	Time of conc. (Tc)	= 11.52 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



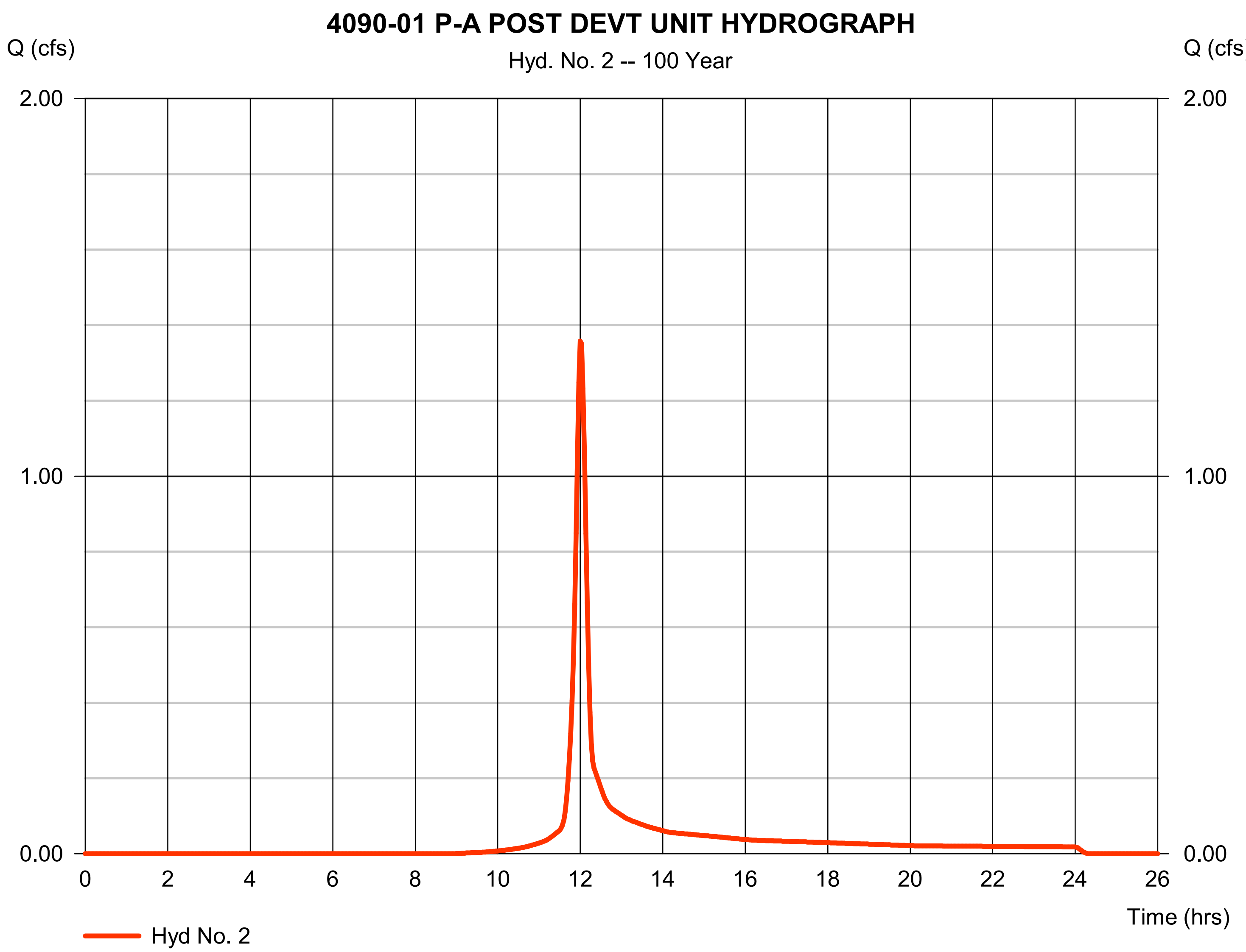
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 2

4090-01 P-A POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.358 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 3,529 cuft
Drainage area	= 0.460 ac	Curve number	= 77
Basin Slope	= 1.5 %	Hydraulic length	= 316 ft
Tc method	= LAG	Time of conc. (Tc)	= 11.52 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

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Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

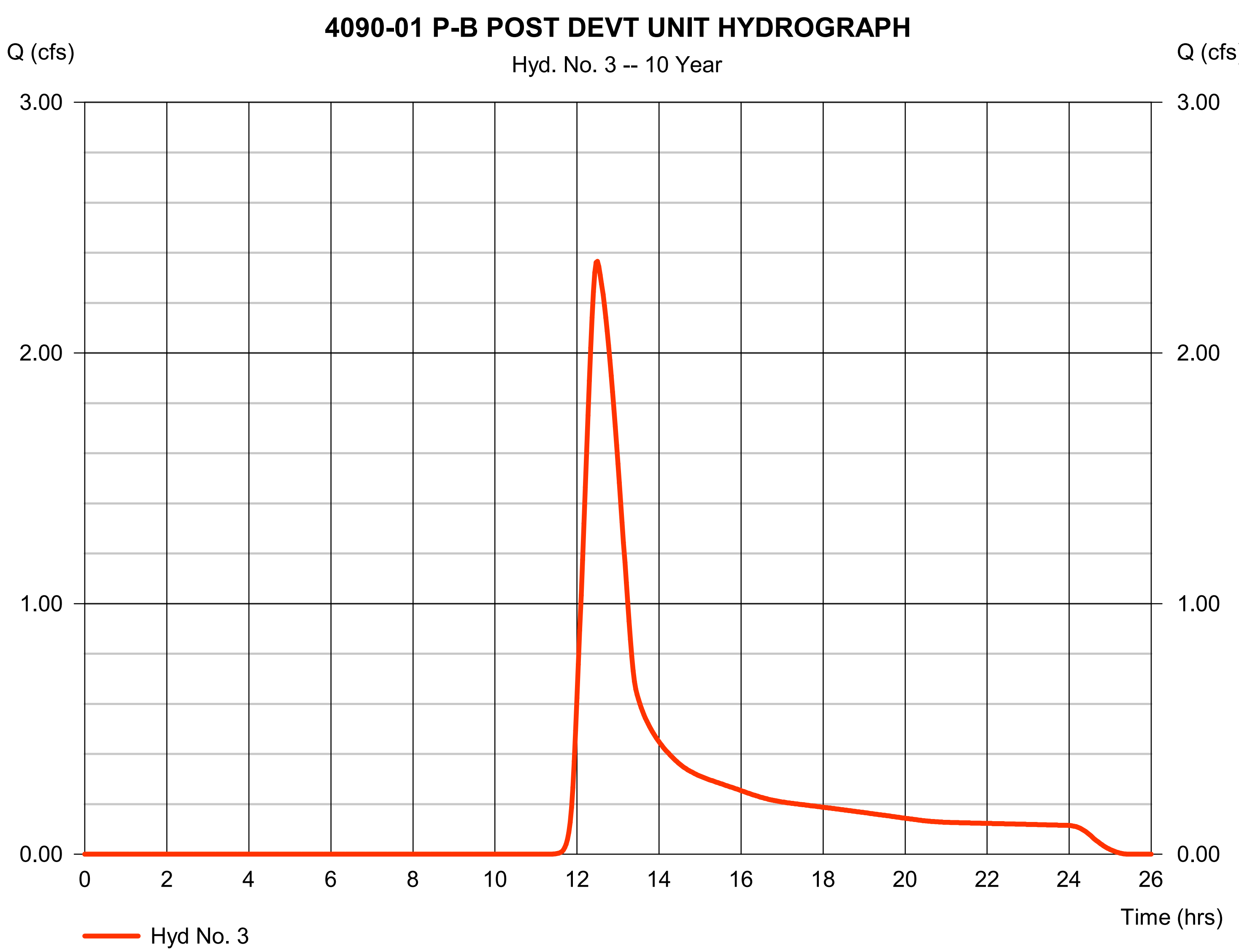
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 3

4090-01 P-B POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 2.366 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.50 hrs
Time interval	= 2 min	Hyd. volume	= 16,708 cuft
Drainage area	= 7.290 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 1804 ft
Tc method	= LAG	Time of conc. (Tc)	= 57.07 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



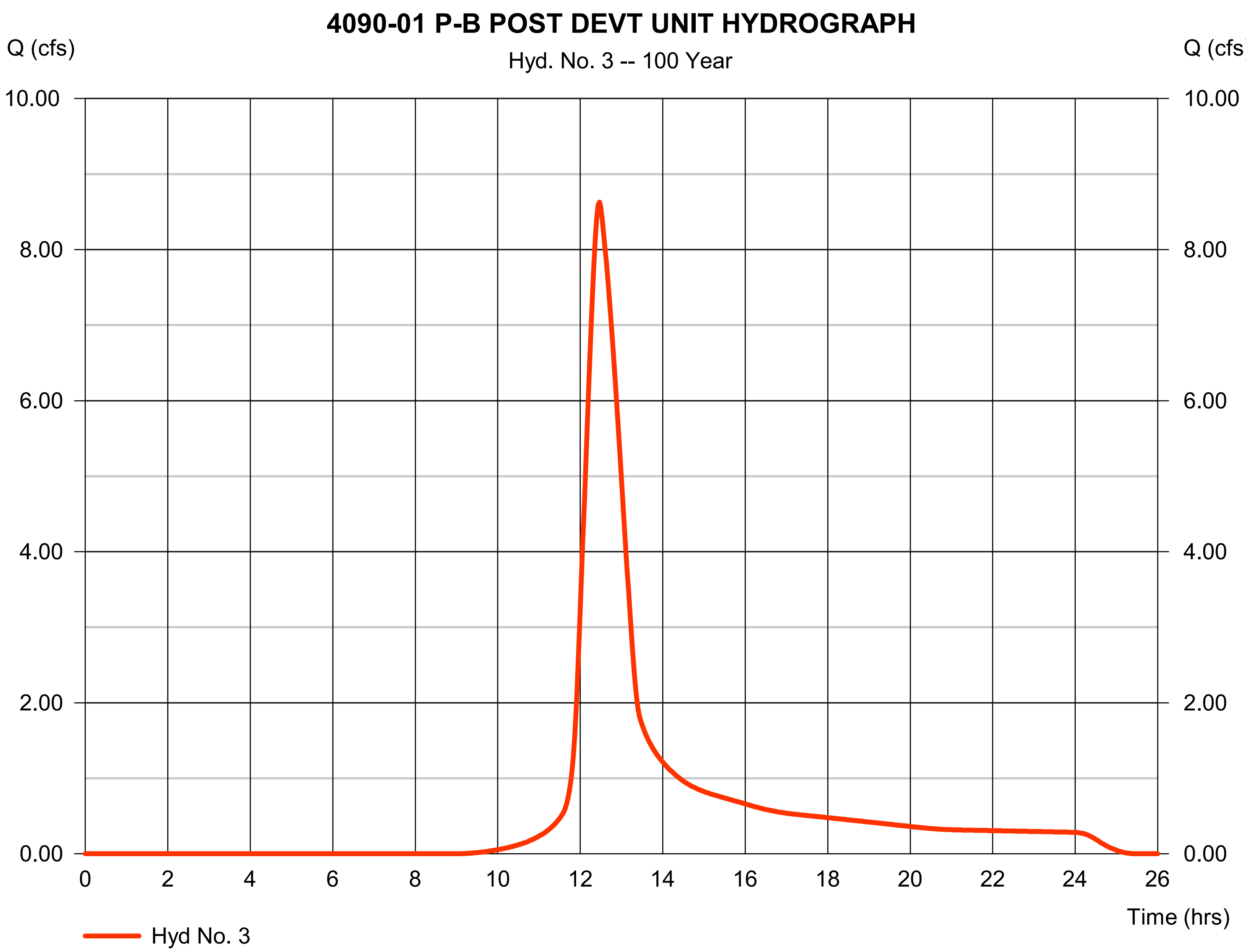
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 3

4090-01 P-B POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 8.629 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.47 hrs
Time interval	= 2 min	Hyd. volume	= 53,832 cuft
Drainage area	= 7.290 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 1804 ft
Tc method	= LAG	Time of conc. (Tc)	= 57.07 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38709 & 38710\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

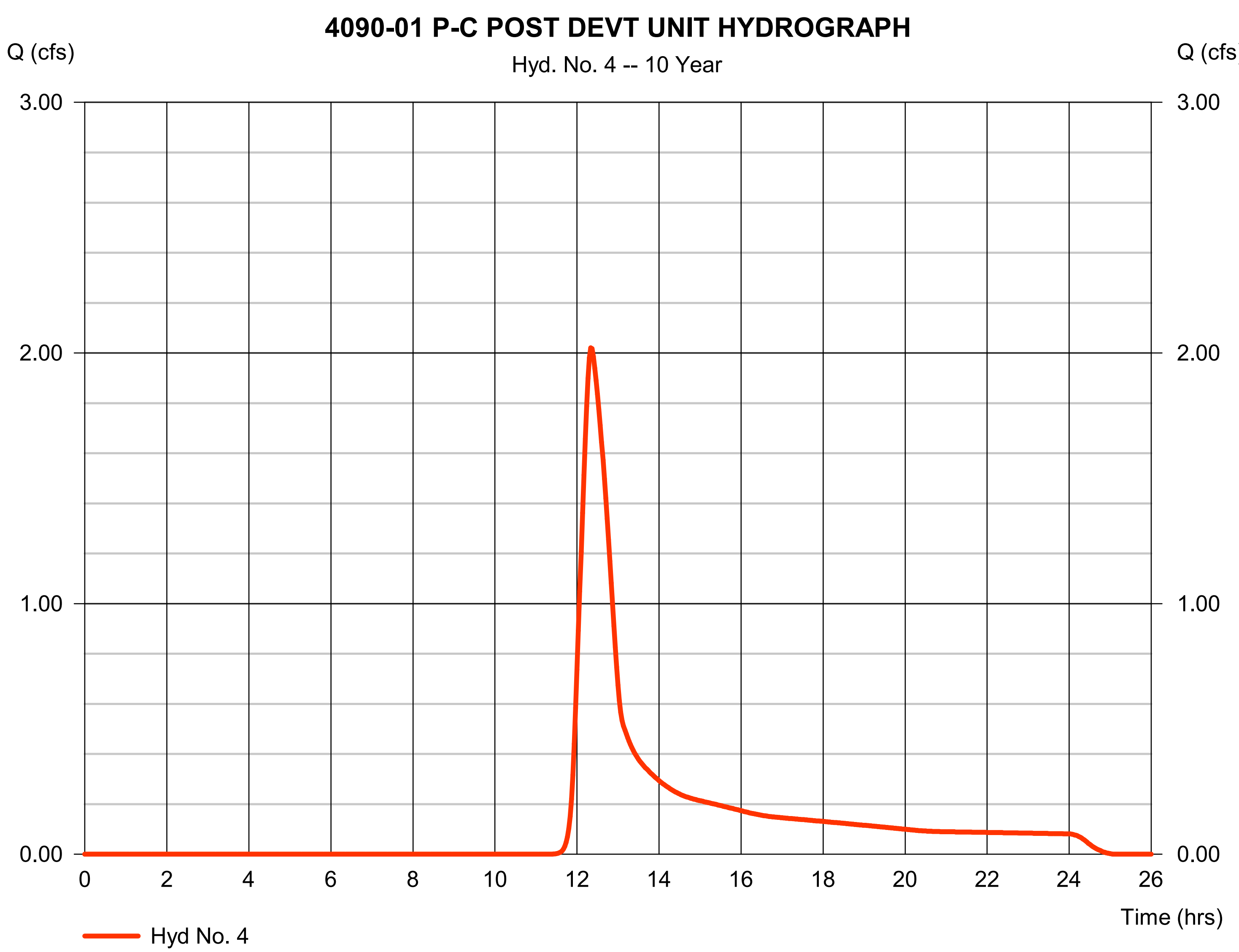
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 4

4090-01 P-C POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 2.020 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 11,865 cuft
Drainage area	= 5.090 ac	Curve number	= 77
Basin Slope	= 1.1 %	Hydraulic length	= 1277 ft
Tc method	= LAG	Time of conc. (Tc)	= 41.20 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



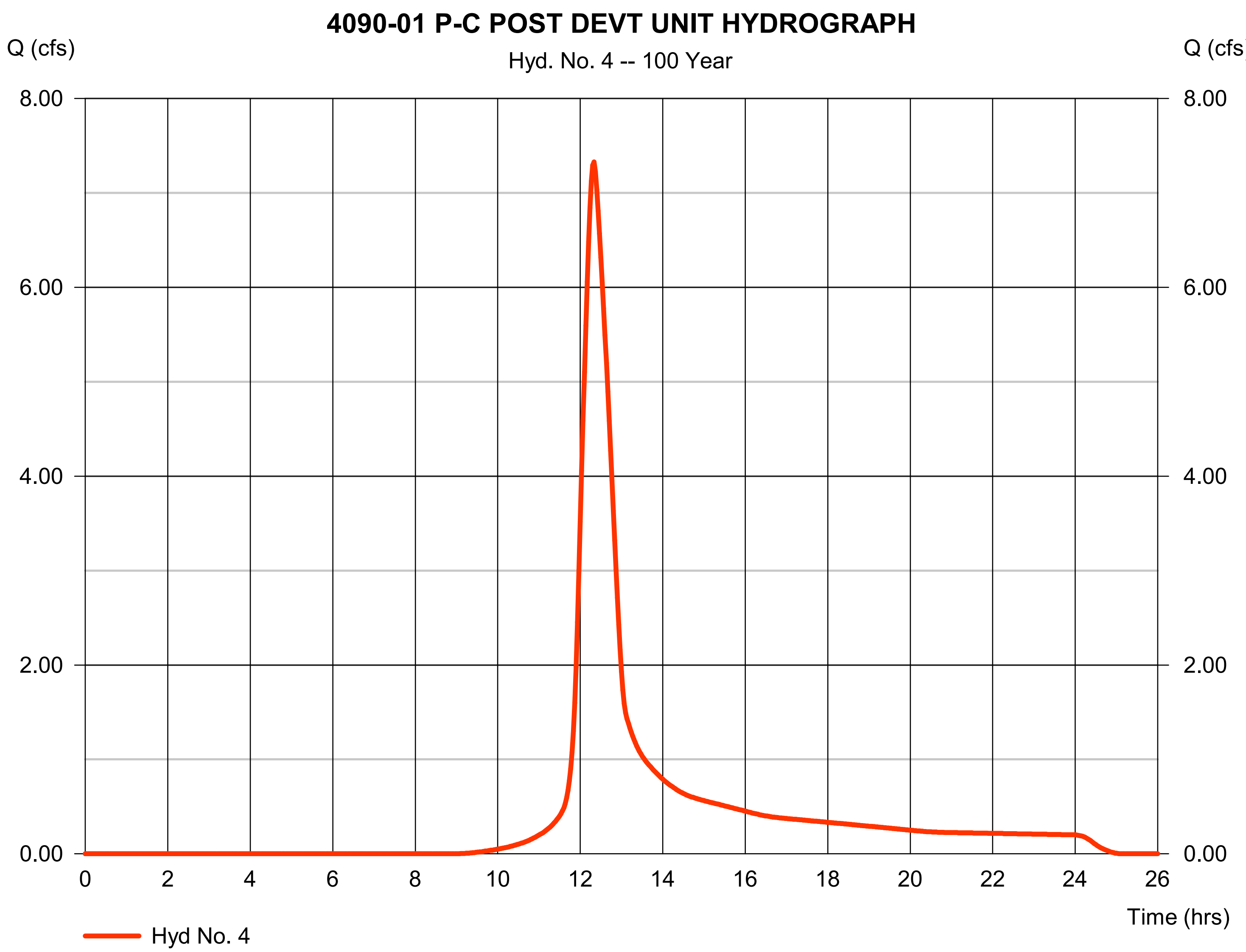
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 4

4090-01 P-C POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 7.327 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 38,229 cuft
Drainage area	= 5.090 ac	Curve number	= 77
Basin Slope	= 1.1 %	Hydraulic length	= 1277 ft
Tc method	= LAG	Time of conc. (Tc)	= 41.20 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

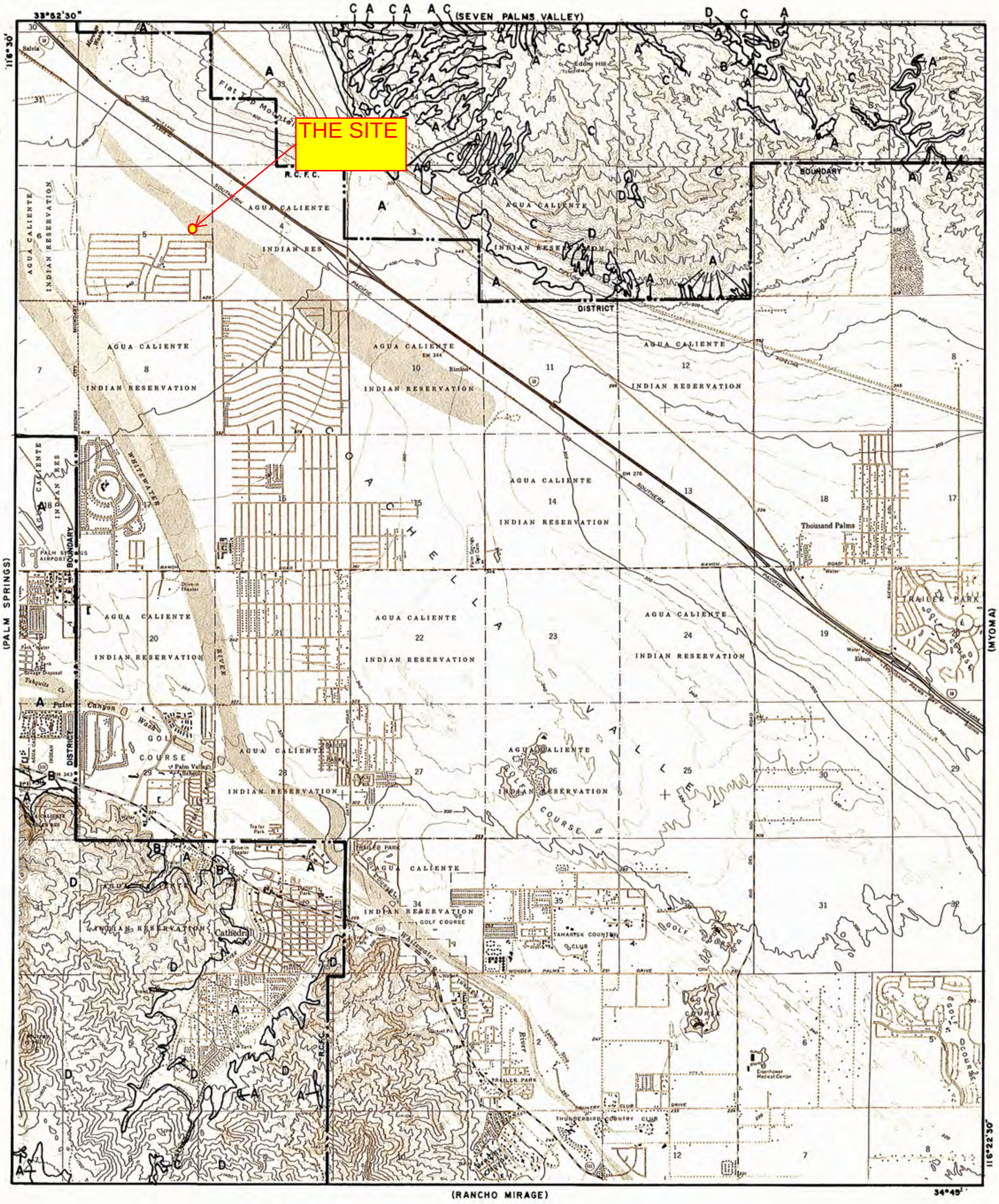
Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38709 & 38710\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX 3

RCFC & WCD HYDROLOGIC SOIL MAP
(PLATE C-1.35)



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

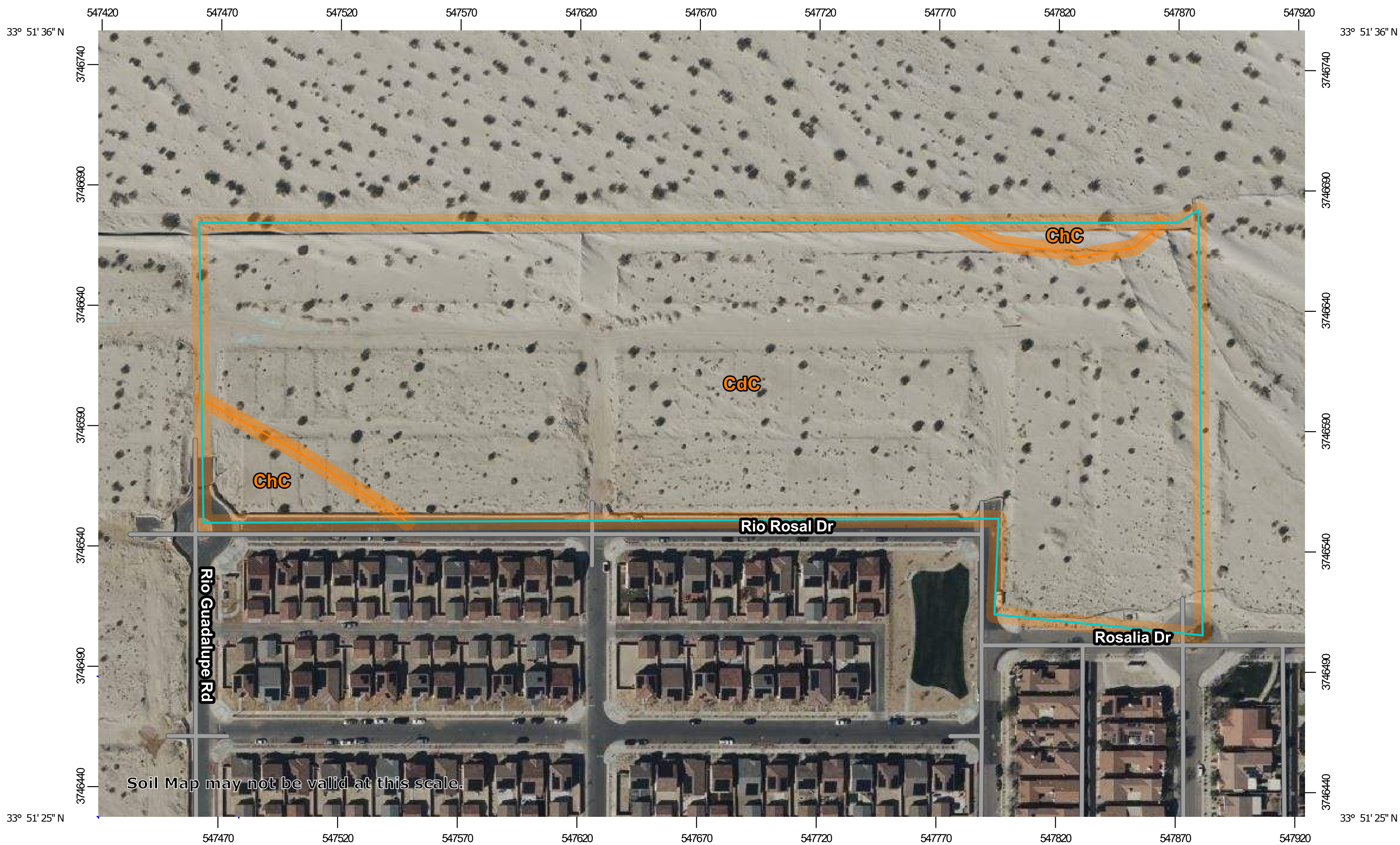
HYDROLOGIC SOILS GROUP MAP FOR CATHEDRAL CITY

PLATE C-1.36

Soil Map—Riverside County, Coachella Valley Area, California
(TTM 38709 & 38710-VERANO)

116° 29' 14" W

116° 28' 54" W



116° 29' 14" W

116° 28' 54" W

Map Scale: 1:2,310 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 30, 60, 120, 180

Feet: 0, 100, 200, 400, 600

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

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

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdC	Carsitas gravelly sand, 0 to 9 percent slopes	13.0	94.5%
ChC	Carsitas cobbly sand, 2 to 9 percent slopes	0.8	5.5%
Totals for Area of Interest		**13.8**	**100.0%**

Riverside County, Coachella Valley Area, California

ChC—Carsitas cobbly sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hkv3
Elevation: 800 feet
Mean annual precipitation: 4 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Carsitas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carsitas

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: cobbly sand
H2 - 10 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD200CA - Rarely Flooded Fans

Hydric soil rating: No

Minor Components

Chuckawalla
Percent of map unit: 4 percent
Hydric soil rating: No

Riverwash
Percent of map unit: 4 percent
Landform: Channels
Hydric soil rating: Yes

Carrizo
Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 3 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

Riverside County, Coachella Valley Area, California

CdC—Carsitas gravelly sand, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hkv0
Elevation: 800 feet
Mean annual precipitation: 4 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 275 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Carsitas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carsitas

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: gravelly sand
H2 - 10 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD200CA - Rarely Flooded Fans

Hydric soil rating: No

Minor Components

Myoma

Percent of map unit: 4 percent
Hydric soil rating: No

Riverwash

Percent of map unit: 4 percent
Landform: Channels
Hydric soil rating: Yes

Carsitas

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, stony or gravelly

Percent of map unit: 3 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

APPENDIX 4

HYDRAFLOW UNIT HYDROGRAPH CALCULATIONS
STORAGE REQUIREMENT, 100YR-24HR

Hydrograph Report

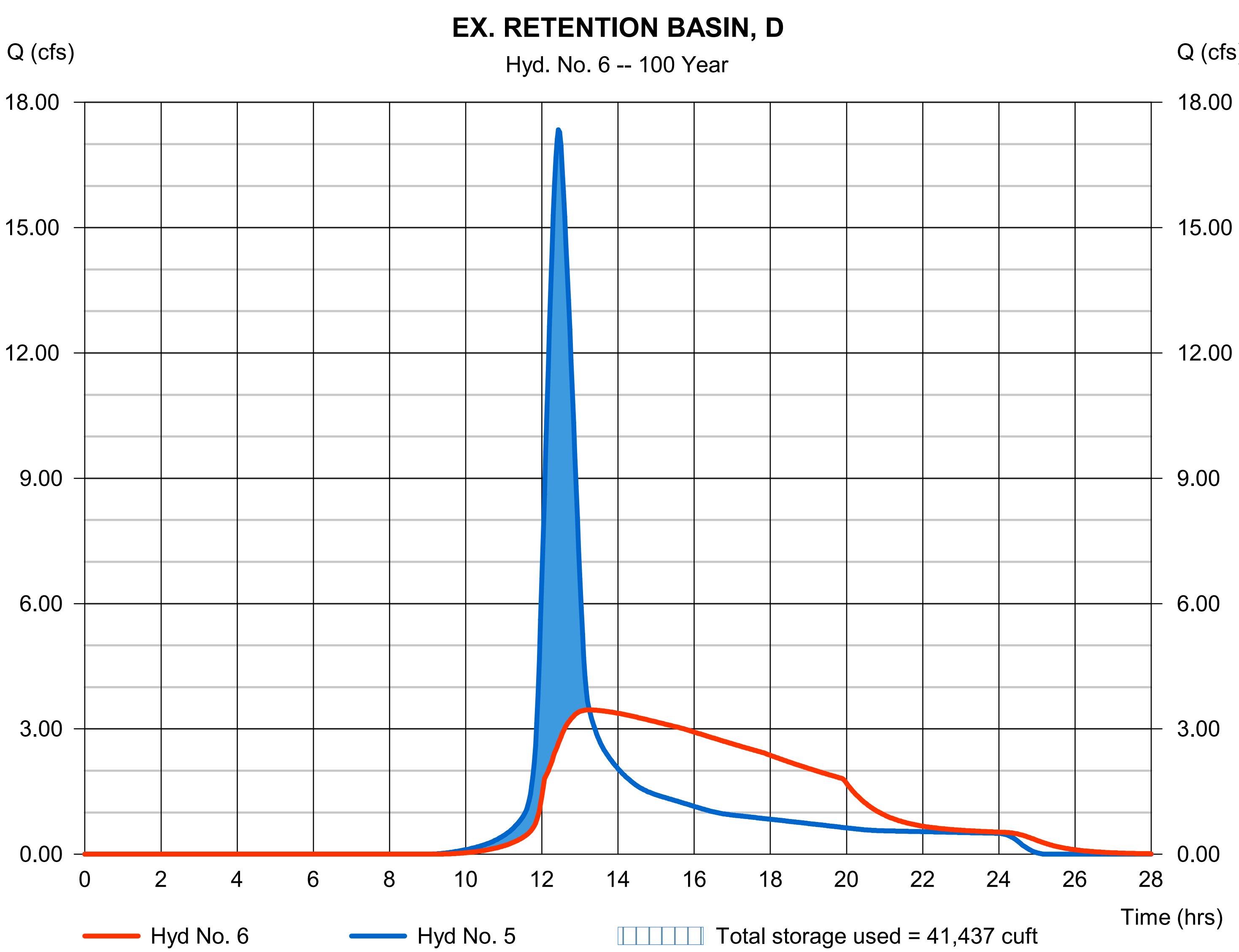
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 6

EX. RETENTION BASIN, D

Hydrograph type	= Reservoir	Peak discharge	= 3.455 cfs
Storm frequency	= 100 yrs	Time to peak	= 13.23 hrs
Time interval	= 2 min	Hyd. volume	= 95,117 cuft
Inflow hyd. No.	= 5 - 4090-01 POST DEVT OVERALL UH	Max. Elevation	= 430.78 ft
Reservoir name	= EX. RETENTION BASIN,D	Max. Storage	= 41,437 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Pond No. 1 - EX. RETENTION BASIN,D

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 447.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	427.00	3,099	0	0
1.00	428.00	8,720	5,672	5,672
2.00	429.00	11,734	10,189	15,861
3.00	430.00	14,542	13,112	28,973
4.00	431.00	17,286	15,893	44,865
5.00	432.00	20,237	18,740	63,605
6.00	433.00	23,479	21,836	85,441

Culvert / Orifice Structures

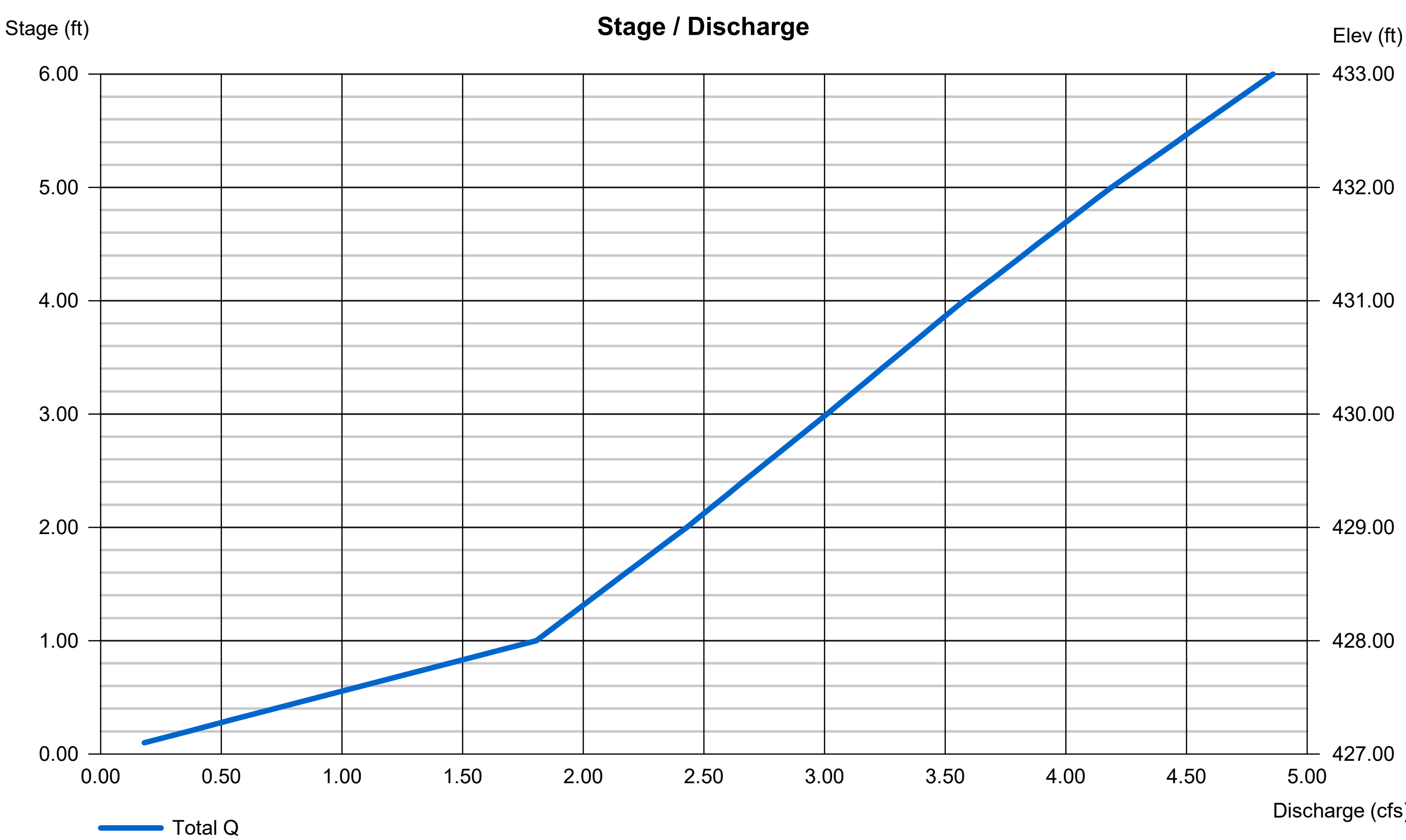
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 447.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 8.940 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38709 & 38710\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 6

EX. RETENTION BASIN, D

Hydrograph type	= Reservoir	Peak discharge	= 3.455 cfs
Storm frequency	= 100 yrs	Time to peak	= 13.23 hrs
Time interval	= 2 min	Hyd. volume	= 95,117 cuft
Inflow hyd. No.	= 5 - 4090-01 POST DEV OVERALL UH	Reservoir name	= EX. RETENTION BAS
Max. Elevation	= 430.78 ft	Max. Storage	= 41,437 cuft

Storage Indication method used. Outflow includes exfiltration.

Hydrograph Discharge Table

(Printed values >= 1.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
10.03	0.114	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.037	0.037
10.07	0.120	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.040	0.040
10.10	0.127	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.043	0.043
10.13	0.134	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.047	0.047
10.17	0.141	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.050	0.050
10.20	0.149	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.054	0.054
10.23	0.156	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.057	0.057
10.27	0.164	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.061	0.061
10.30	0.173	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.065	0.065
10.33	0.181	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.069	0.069
10.37	0.190	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.074	0.074
10.40	0.199	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.078	0.078
10.43	0.209	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.083	0.083
10.47	0.219	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.088	0.088
10.50	0.229	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.093	0.093
10.53	0.240	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.098	0.098
10.57	0.251	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.104	0.104
10.60	0.263	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.110	0.110
10.63	0.275	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.116	0.116
10.67	0.288	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.122	0.122

Continues on next page...

EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
10.70	0.301	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.128	0.128
10.73	0.315	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.135	0.135
10.77	0.329	427.08	-----	-----	-----	-----	-----	-----	-----	-----	0.142	0.142
10.80	0.344	427.08	-----	-----	-----	-----	-----	-----	-----	-----	0.149	0.149
10.83	0.360	427.09	-----	-----	-----	-----	-----	-----	-----	-----	0.157	0.157
10.87	0.376	427.09	-----	-----	-----	-----	-----	-----	-----	-----	0.165	0.165
10.90	0.393	427.10	-----	-----	-----	-----	-----	-----	-----	-----	0.173	0.173
10.93	0.410	427.10	-----	-----	-----	-----	-----	-----	-----	-----	0.182	0.182
10.97	0.429	427.11	-----	-----	-----	-----	-----	-----	-----	-----	0.190	0.190
11.00	0.448	427.11	-----	-----	-----	-----	-----	-----	-----	-----	0.200	0.200
11.03	0.468	427.12	-----	-----	-----	-----	-----	-----	-----	-----	0.209	0.209
11.07	0.489	427.12	-----	-----	-----	-----	-----	-----	-----	-----	0.219	0.219
11.10	0.511	427.13	-----	-----	-----	-----	-----	-----	-----	-----	0.230	0.230
11.13	0.534	427.13	-----	-----	-----	-----	-----	-----	-----	-----	0.241	0.241
11.17	0.558	427.14	-----	-----	-----	-----	-----	-----	-----	-----	0.252	0.252
11.20	0.584	427.15	-----	-----	-----	-----	-----	-----	-----	-----	0.264	0.264
11.23	0.611	427.15	-----	-----	-----	-----	-----	-----	-----	-----	0.277	0.277
11.27	0.640	427.16	-----	-----	-----	-----	-----	-----	-----	-----	0.290	0.290
11.30	0.671	427.17	-----	-----	-----	-----	-----	-----	-----	-----	0.304	0.304
11.33	0.703	427.18	-----	-----	-----	-----	-----	-----	-----	-----	0.318	0.318
11.37	0.738	427.18	-----	-----	-----	-----	-----	-----	-----	-----	0.333	0.333
11.40	0.774	427.19	-----	-----	-----	-----	-----	-----	-----	-----	0.349	0.349
11.43	0.813	427.20	-----	-----	-----	-----	-----	-----	-----	-----	0.365	0.366
11.47	0.854	427.21	-----	-----	-----	-----	-----	-----	-----	-----	0.383	0.383
11.50	0.898	427.22	-----	-----	-----	-----	-----	-----	-----	-----	0.402	0.401
11.53	0.946	427.23	-----	-----	-----	-----	-----	-----	-----	-----	0.421	0.421
11.57	1.004	427.24	-----	-----	-----	-----	-----	-----	-----	-----	0.442	0.442
11.60	1.076	427.26	-----	-----	-----	-----	-----	-----	-----	-----	0.464	0.464

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
11.63	1.168	427.27	-----	-----	-----	-----	-----	-----	-----	-----	0.489	0.489
11.67	1.286	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.516	0.516
11.70	1.438	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.548	0.548
11.73	1.631	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.585	0.585
11.77	1.874	427.35	-----	-----	-----	-----	-----	-----	-----	-----	0.629	0.629
11.80	2.190	427.38	-----	-----	-----	-----	-----	-----	-----	-----	0.681	0.681
11.83	2.602	427.41	-----	-----	-----	-----	-----	-----	-----	-----	0.746	0.746
11.87	3.139	427.46	-----	-----	-----	-----	-----	-----	-----	-----	0.825	0.825
11.90	3.832	427.51	-----	-----	-----	-----	-----	-----	-----	-----	0.925	0.925
11.93	4.675	427.58	-----	-----	-----	-----	-----	-----	-----	-----	1.050	1.050
11.97	5.617	427.67	-----	-----	-----	-----	-----	-----	-----	-----	1.203	1.203
12.00	6.601	427.77	-----	-----	-----	-----	-----	-----	-----	-----	1.387	1.387
12.03	7.600	427.89	-----	-----	-----	-----	-----	-----	-----	-----	1.601	1.601
12.07	8.612	428.01	-----	-----	-----	-----	-----	-----	-----	-----	1.812	1.812
12.10	9.630	428.10	-----	-----	-----	-----	-----	-----	-----	-----	1.866	1.866
12.13	10.65	428.20	-----	-----	-----	-----	-----	-----	-----	-----	1.926	1.926
12.17	11.65	428.30	-----	-----	-----	-----	-----	-----	-----	-----	1.994	1.994
12.20	12.63	428.42	-----	-----	-----	-----	-----	-----	-----	-----	2.068	2.068
12.23	13.58	428.55	-----	-----	-----	-----	-----	-----	-----	-----	2.149	2.149
12.27	14.47	428.69	-----	-----	-----	-----	-----	-----	-----	-----	2.236	2.236
12.30	15.30	428.84	-----	-----	-----	-----	-----	-----	-----	-----	2.328	2.328
12.33	16.05	429.00	-----	-----	-----	-----	-----	-----	-----	-----	2.426	2.426
12.37	16.67	429.12	-----	-----	-----	-----	-----	-----	-----	-----	2.501	2.501
12.40	17.11	429.26	-----	-----	-----	-----	-----	-----	-----	-----	2.577	2.577
12.43	17.34 <<	429.39	-----	-----	-----	-----	-----	-----	-----	-----	2.655	2.655
12.47	17.29	429.52	-----	-----	-----	-----	-----	-----	-----	-----	2.732	2.732
12.50	16.96	429.65	-----	-----	-----	-----	-----	-----	-----	-----	2.809	2.809
12.53	16.46	429.78	-----	-----	-----	-----	-----	-----	-----	-----	2.883	2.883

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.57	15.87	429.90	-----	-----	-----	-----	-----	-----	-----	-----	2.953	2.953
12.60	15.26	430.01	-----	-----	-----	-----	-----	-----	-----	-----	3.018	3.018
12.63	14.62	430.10	-----	-----	-----	-----	-----	-----	-----	-----	3.069	3.069
12.67	13.96	430.19	-----	-----	-----	-----	-----	-----	-----	-----	3.117	3.117
12.70	13.27	430.27	-----	-----	-----	-----	-----	-----	-----	-----	3.162	3.162
12.73	12.56	430.34	-----	-----	-----	-----	-----	-----	-----	-----	3.203	3.203
12.77	11.83	430.41	-----	-----	-----	-----	-----	-----	-----	-----	3.242	3.242
12.80	11.09	430.47	-----	-----	-----	-----	-----	-----	-----	-----	3.277	3.277
12.83	10.33	430.53	-----	-----	-----	-----	-----	-----	-----	-----	3.309	3.309
12.87	9.572	430.58	-----	-----	-----	-----	-----	-----	-----	-----	3.337	3.337
12.90	8.810	430.62	-----	-----	-----	-----	-----	-----	-----	-----	3.362	3.362
12.93	8.055	430.66	-----	-----	-----	-----	-----	-----	-----	-----	3.384	3.384
12.97	7.314	430.69	-----	-----	-----	-----	-----	-----	-----	-----	3.402	3.402
13.00	6.596	430.72	-----	-----	-----	-----	-----	-----	-----	-----	3.418	3.418
13.03	5.909	430.74	-----	-----	-----	-----	-----	-----	-----	-----	3.430	3.430
13.07	5.274	430.76	-----	-----	-----	-----	-----	-----	-----	-----	3.439	3.439
13.10	4.710	430.77	-----	-----	-----	-----	-----	-----	-----	-----	3.446	3.446
13.13	4.241	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.450	3.450
13.17	3.894	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.453	3.453
13.20	3.663	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.454	3.454
13.23	3.509	430.78 <<	-----	-----	-----	-----	-----	-----	-----	-----	3.455	3.455
<<												
13.27	3.386	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.455	3.455
13.30	3.272	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.454	3.454
13.33	3.165	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.453	3.453
13.37	3.066	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.452	3.452
13.40	2.975	430.78	-----	-----	-----	-----	-----	-----	-----	-----	3.450	3.450
13.43	2.890	430.77	-----	-----	-----	-----	-----	-----	-----	-----	3.448	3.448

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
13.47	2.811	430.77	-----	-----	-----	-----	-----	-----	-----	-----	3.445	3.445
13.50	2.739	430.76	-----	-----	-----	-----	-----	-----	-----	-----	3.442	3.442
13.53	2.672	430.76	-----	-----	-----	-----	-----	-----	-----	-----	3.439	3.439
13.57	2.610	430.75	-----	-----	-----	-----	-----	-----	-----	-----	3.436	3.436
13.60	2.553	430.74	-----	-----	-----	-----	-----	-----	-----	-----	3.432	3.432
13.63	2.499	430.74	-----	-----	-----	-----	-----	-----	-----	-----	3.428	3.428
13.67	2.450	430.73	-----	-----	-----	-----	-----	-----	-----	-----	3.424	3.424
13.70	2.403	430.72	-----	-----	-----	-----	-----	-----	-----	-----	3.420	3.420
13.73	2.358	430.71	-----	-----	-----	-----	-----	-----	-----	-----	3.415	3.415
13.77	2.315	430.71	-----	-----	-----	-----	-----	-----	-----	-----	3.411	3.411
13.80	2.273	430.70	-----	-----	-----	-----	-----	-----	-----	-----	3.406	3.406
13.83	2.232	430.69	-----	-----	-----	-----	-----	-----	-----	-----	3.401	3.401
13.87	2.193	430.68	-----	-----	-----	-----	-----	-----	-----	-----	3.396	3.396
13.90	2.155	430.67	-----	-----	-----	-----	-----	-----	-----	-----	3.391	3.391
13.93	2.118	430.66	-----	-----	-----	-----	-----	-----	-----	-----	3.385	3.385
13.97	2.082	430.65	-----	-----	-----	-----	-----	-----	-----	-----	3.380	3.380
14.00	2.047	430.64	-----	-----	-----	-----	-----	-----	-----	-----	3.374	3.374
14.03	2.013	430.63	-----	-----	-----	-----	-----	-----	-----	-----	3.368	3.368
14.07	1.981	430.62	-----	-----	-----	-----	-----	-----	-----	-----	3.363	3.363
14.10	1.949	430.61	-----	-----	-----	-----	-----	-----	-----	-----	3.357	3.357
14.13	1.918	430.60	-----	-----	-----	-----	-----	-----	-----	-----	3.350	3.350
14.17	1.889	430.59	-----	-----	-----	-----	-----	-----	-----	-----	3.344	3.344
14.20	1.860	430.58	-----	-----	-----	-----	-----	-----	-----	-----	3.338	3.338
14.23	1.832	430.57	-----	-----	-----	-----	-----	-----	-----	-----	3.332	3.332
14.27	1.804	430.56	-----	-----	-----	-----	-----	-----	-----	-----	3.325	3.325
14.30	1.778	430.54	-----	-----	-----	-----	-----	-----	-----	-----	3.319	3.319
14.33	1.753	430.53	-----	-----	-----	-----	-----	-----	-----	-----	3.312	3.312
14.37	1.728	430.52	-----	-----	-----	-----	-----	-----	-----	-----	3.305	3.305

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
14.40	1.704	430.51	-----	-----	-----	-----	-----	-----	-----	-----	3.298	3.298
14.43	1.681	430.50	-----	-----	-----	-----	-----	-----	-----	-----	3.292	3.292
14.47	1.659	430.48	-----	-----	-----	-----	-----	-----	-----	-----	3.285	3.285
14.50	1.638	430.47	-----	-----	-----	-----	-----	-----	-----	-----	3.278	3.278
14.53	1.618	430.46	-----	-----	-----	-----	-----	-----	-----	-----	3.271	3.271
14.57	1.599	430.45	-----	-----	-----	-----	-----	-----	-----	-----	3.263	3.263
14.60	1.581	430.43	-----	-----	-----	-----	-----	-----	-----	-----	3.256	3.256
14.63	1.565	430.42	-----	-----	-----	-----	-----	-----	-----	-----	3.249	3.249
14.67	1.549	430.41	-----	-----	-----	-----	-----	-----	-----	-----	3.242	3.242
14.70	1.533	430.40	-----	-----	-----	-----	-----	-----	-----	-----	3.235	3.235
14.73	1.519	430.38	-----	-----	-----	-----	-----	-----	-----	-----	3.227	3.227
14.77	1.505	430.37	-----	-----	-----	-----	-----	-----	-----	-----	3.220	3.220
14.80	1.492	430.36	-----	-----	-----	-----	-----	-----	-----	-----	3.213	3.213
14.83	1.479	430.34	-----	-----	-----	-----	-----	-----	-----	-----	3.205	3.205
14.87	1.467	430.33	-----	-----	-----	-----	-----	-----	-----	-----	3.198	3.198
14.90	1.456	430.32	-----	-----	-----	-----	-----	-----	-----	-----	3.190	3.190
14.93	1.445	430.31	-----	-----	-----	-----	-----	-----	-----	-----	3.183	3.183
14.97	1.434	430.29	-----	-----	-----	-----	-----	-----	-----	-----	3.175	3.175
15.00	1.424	430.28	-----	-----	-----	-----	-----	-----	-----	-----	3.168	3.168
15.03	1.414	430.27	-----	-----	-----	-----	-----	-----	-----	-----	3.160	3.160
15.07	1.404	430.25	-----	-----	-----	-----	-----	-----	-----	-----	3.153	3.153
15.10	1.394	430.24	-----	-----	-----	-----	-----	-----	-----	-----	3.145	3.145
15.13	1.385	430.23	-----	-----	-----	-----	-----	-----	-----	-----	3.138	3.138
15.17	1.376	430.21	-----	-----	-----	-----	-----	-----	-----	-----	3.130	3.130
15.20	1.367	430.20	-----	-----	-----	-----	-----	-----	-----	-----	3.123	3.123
15.23	1.358	430.19	-----	-----	-----	-----	-----	-----	-----	-----	3.115	3.115
15.27	1.349	430.17	-----	-----	-----	-----	-----	-----	-----	-----	3.108	3.108
15.30	1.339	430.16	-----	-----	-----	-----	-----	-----	-----	-----	3.100	3.100

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
15.33	1.330	430.15	-----	-----	-----	-----	-----	-----	-----	-----	3.093	3.093
15.37	1.321	430.13	-----	-----	-----	-----	-----	-----	-----	-----	3.085	3.085
15.40	1.312	430.12	-----	-----	-----	-----	-----	-----	-----	-----	3.078	3.078
15.43	1.303	430.11	-----	-----	-----	-----	-----	-----	-----	-----	3.070	3.070
15.47	1.294	430.09	-----	-----	-----	-----	-----	-----	-----	-----	3.062	3.062
15.50	1.285	430.08	-----	-----	-----	-----	-----	-----	-----	-----	3.055	3.055
15.53	1.276	430.07	-----	-----	-----	-----	-----	-----	-----	-----	3.047	3.047
15.57	1.266	430.05	-----	-----	-----	-----	-----	-----	-----	-----	3.040	3.040
15.60	1.257	430.04	-----	-----	-----	-----	-----	-----	-----	-----	3.032	3.032
15.63	1.248	430.03	-----	-----	-----	-----	-----	-----	-----	-----	3.024	3.024
15.67	1.239	430.01	-----	-----	-----	-----	-----	-----	-----	-----	3.017	3.017
15.70	1.229	430.00	-----	-----	-----	-----	-----	-----	-----	-----	3.009	3.009
15.73	1.220	429.98	-----	-----	-----	-----	-----	-----	-----	-----	3.000	3.000
15.77	1.211	429.97	-----	-----	-----	-----	-----	-----	-----	-----	2.990	2.990
15.80	1.202	429.95	-----	-----	-----	-----	-----	-----	-----	-----	2.981	2.981
15.83	1.192	429.93	-----	-----	-----	-----	-----	-----	-----	-----	2.971	2.971
15.87	1.183	429.92	-----	-----	-----	-----	-----	-----	-----	-----	2.962	2.962
15.90	1.174	429.90	-----	-----	-----	-----	-----	-----	-----	-----	2.952	2.952
15.93	1.164	429.89	-----	-----	-----	-----	-----	-----	-----	-----	2.943	2.943
15.97	1.155	429.87	-----	-----	-----	-----	-----	-----	-----	-----	2.934	2.934
16.00	1.145	429.85	-----	-----	-----	-----	-----	-----	-----	-----	2.924	2.924
16.03	1.136	429.84	-----	-----	-----	-----	-----	-----	-----	-----	2.915	2.915
16.07	1.127	429.82	-----	-----	-----	-----	-----	-----	-----	-----	2.905	2.905
16.10	1.117	429.80	-----	-----	-----	-----	-----	-----	-----	-----	2.896	2.896
16.13	1.108	429.79	-----	-----	-----	-----	-----	-----	-----	-----	2.886	2.886
16.17	1.099	429.77	-----	-----	-----	-----	-----	-----	-----	-----	2.877	2.877
16.20	1.090	429.76	-----	-----	-----	-----	-----	-----	-----	-----	2.867	2.867
16.23	1.081	429.74	-----	-----	-----	-----	-----	-----	-----	-----	2.858	2.858

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
16.27	1.072	429.72	-----	-----	-----	-----	-----	-----	-----	-----	2.848	2.848
16.30	1.063	429.71	-----	-----	-----	-----	-----	-----	-----	-----	2.839	2.839
16.33	1.055	429.69	-----	-----	-----	-----	-----	-----	-----	-----	2.830	2.830
16.37	1.047	429.67	-----	-----	-----	-----	-----	-----	-----	-----	2.820	2.820
16.40	1.038	429.66	-----	-----	-----	-----	-----	-----	-----	-----	2.811	2.811
16.43	1.031	429.64	-----	-----	-----	-----	-----	-----	-----	-----	2.801	2.801
16.47	1.023	429.63	-----	-----	-----	-----	-----	-----	-----	-----	2.792	2.792
16.50	1.016	429.61	-----	-----	-----	-----	-----	-----	-----	-----	2.782	2.782
16.53	1.009	429.59	-----	-----	-----	-----	-----	-----	-----	-----	2.773	2.773
16.57	1.002	429.58	-----	-----	-----	-----	-----	-----	-----	-----	2.764	2.764
16.60	0.996	429.56	-----	-----	-----	-----	-----	-----	-----	-----	2.754	2.754
16.63	0.990	429.54	-----	-----	-----	-----	-----	-----	-----	-----	2.745	2.745
16.67	0.984	429.53	-----	-----	-----	-----	-----	-----	-----	-----	2.736	2.736
16.70	0.978	429.51	-----	-----	-----	-----	-----	-----	-----	-----	2.726	2.726
16.73	0.973	429.50	-----	-----	-----	-----	-----	-----	-----	-----	2.717	2.717
16.77	0.968	429.48	-----	-----	-----	-----	-----	-----	-----	-----	2.708	2.708
16.80	0.963	429.47	-----	-----	-----	-----	-----	-----	-----	-----	2.699	2.699
16.83	0.959	429.45	-----	-----	-----	-----	-----	-----	-----	-----	2.689	2.689
16.87	0.954	429.43	-----	-----	-----	-----	-----	-----	-----	-----	2.680	2.680
16.90	0.950	429.42	-----	-----	-----	-----	-----	-----	-----	-----	2.671	2.671
16.93	0.946	429.40	-----	-----	-----	-----	-----	-----	-----	-----	2.662	2.662
16.97	0.942	429.39	-----	-----	-----	-----	-----	-----	-----	-----	2.653	2.653
17.00	0.938	429.37	-----	-----	-----	-----	-----	-----	-----	-----	2.644	2.644
17.03	0.935	429.35	-----	-----	-----	-----	-----	-----	-----	-----	2.635	2.635
17.07	0.931	429.34	-----	-----	-----	-----	-----	-----	-----	-----	2.626	2.626
17.10	0.927	429.32	-----	-----	-----	-----	-----	-----	-----	-----	2.617	2.617
17.13	0.924	429.31	-----	-----	-----	-----	-----	-----	-----	-----	2.608	2.608
17.17	0.921	429.29	-----	-----	-----	-----	-----	-----	-----	-----	2.599	2.599

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
17.20	0.917	429.28	-----	-----	-----	-----	-----	-----	-----	-----	2.590	2.590
17.23	0.914	429.26	-----	-----	-----	-----	-----	-----	-----	-----	2.581	2.581
17.27	0.911	429.25	-----	-----	-----	-----	-----	-----	-----	-----	2.572	2.572
17.30	0.908	429.23	-----	-----	-----	-----	-----	-----	-----	-----	2.563	2.563
17.33	0.904	429.22	-----	-----	-----	-----	-----	-----	-----	-----	2.554	2.554
17.37	0.901	429.20	-----	-----	-----	-----	-----	-----	-----	-----	2.546	2.546
17.40	0.898	429.19	-----	-----	-----	-----	-----	-----	-----	-----	2.537	2.537
17.43	0.894	429.17	-----	-----	-----	-----	-----	-----	-----	-----	2.528	2.528
17.47	0.891	429.16	-----	-----	-----	-----	-----	-----	-----	-----	2.519	2.519
17.50	0.888	429.14	-----	-----	-----	-----	-----	-----	-----	-----	2.511	2.511
17.53	0.884	429.13	-----	-----	-----	-----	-----	-----	-----	-----	2.502	2.502
17.57	0.881	429.11	-----	-----	-----	-----	-----	-----	-----	-----	2.494	2.494
17.60	0.878	429.10	-----	-----	-----	-----	-----	-----	-----	-----	2.485	2.485
17.63	0.874	429.08	-----	-----	-----	-----	-----	-----	-----	-----	2.477	2.477
17.67	0.871	429.07	-----	-----	-----	-----	-----	-----	-----	-----	2.468	2.468
17.70	0.868	429.05	-----	-----	-----	-----	-----	-----	-----	-----	2.460	2.460
17.73	0.864	429.04	-----	-----	-----	-----	-----	-----	-----	-----	2.451	2.451
17.77	0.861	429.02	-----	-----	-----	-----	-----	-----	-----	-----	2.443	2.443
17.80	0.858	429.01	-----	-----	-----	-----	-----	-----	-----	-----	2.434	2.434
17.83	0.854	428.99	-----	-----	-----	-----	-----	-----	-----	-----	2.425	2.425
17.87	0.851	428.98	-----	-----	-----	-----	-----	-----	-----	-----	2.413	2.413
17.90	0.848	428.96	-----	-----	-----	-----	-----	-----	-----	-----	2.402	2.402
17.93	0.844	428.94	-----	-----	-----	-----	-----	-----	-----	-----	2.391	2.391
17.97	0.841	428.92	-----	-----	-----	-----	-----	-----	-----	-----	2.379	2.379
18.00	0.838	428.90	-----	-----	-----	-----	-----	-----	-----	-----	2.368	2.368
18.03	0.834	428.89	-----	-----	-----	-----	-----	-----	-----	-----	2.357	2.357
18.07	0.831	428.87	-----	-----	-----	-----	-----	-----	-----	-----	2.346	2.346
18.10	0.827	428.85	-----	-----	-----	-----	-----	-----	-----	-----	2.335	2.335

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
18.13	0.824	428.83	-----	-----	-----	-----	-----	-----	-----	-----	2.324	2.324
18.17	0.821	428.81	-----	-----	-----	-----	-----	-----	-----	-----	2.313	2.313
18.20	0.817	428.80	-----	-----	-----	-----	-----	-----	-----	-----	2.302	2.302
18.23	0.814	428.78	-----	-----	-----	-----	-----	-----	-----	-----	2.291	2.291
18.27	0.810	428.76	-----	-----	-----	-----	-----	-----	-----	-----	2.280	2.280
18.30	0.807	428.74	-----	-----	-----	-----	-----	-----	-----	-----	2.269	2.269
18.33	0.804	428.73	-----	-----	-----	-----	-----	-----	-----	-----	2.258	2.258
18.37	0.800	428.71	-----	-----	-----	-----	-----	-----	-----	-----	2.248	2.248
18.40	0.797	428.69	-----	-----	-----	-----	-----	-----	-----	-----	2.237	2.237
18.43	0.794	428.68	-----	-----	-----	-----	-----	-----	-----	-----	2.227	2.227
18.47	0.790	428.66	-----	-----	-----	-----	-----	-----	-----	-----	2.216	2.216
18.50	0.787	428.64	-----	-----	-----	-----	-----	-----	-----	-----	2.206	2.206
18.53	0.783	428.63	-----	-----	-----	-----	-----	-----	-----	-----	2.195	2.195
18.57	0.780	428.61	-----	-----	-----	-----	-----	-----	-----	-----	2.185	2.185
18.60	0.776	428.59	-----	-----	-----	-----	-----	-----	-----	-----	2.175	2.175
18.63	0.773	428.58	-----	-----	-----	-----	-----	-----	-----	-----	2.164	2.164
18.67	0.770	428.56	-----	-----	-----	-----	-----	-----	-----	-----	2.154	2.154
18.70	0.766	428.54	-----	-----	-----	-----	-----	-----	-----	-----	2.144	2.144
18.73	0.763	428.53	-----	-----	-----	-----	-----	-----	-----	-----	2.134	2.134
18.77	0.759	428.51	-----	-----	-----	-----	-----	-----	-----	-----	2.124	2.124
18.80	0.756	428.50	-----	-----	-----	-----	-----	-----	-----	-----	2.114	2.114
18.83	0.752	428.48	-----	-----	-----	-----	-----	-----	-----	-----	2.104	2.104
18.87	0.749	428.46	-----	-----	-----	-----	-----	-----	-----	-----	2.094	2.094
18.90	0.746	428.45	-----	-----	-----	-----	-----	-----	-----	-----	2.084	2.084
18.93	0.742	428.43	-----	-----	-----	-----	-----	-----	-----	-----	2.074	2.074
18.97	0.739	428.42	-----	-----	-----	-----	-----	-----	-----	-----	2.065	2.065
19.00	0.735	428.40	-----	-----	-----	-----	-----	-----	-----	-----	2.055	2.055
19.03	0.732	428.39	-----	-----	-----	-----	-----	-----	-----	-----	2.045	2.045

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
19.07	0.728	428.37	-----	-----	-----	-----	-----	-----	-----	-----	2.036	2.036
19.10	0.725	428.36	-----	-----	-----	-----	-----	-----	-----	-----	2.026	2.026
19.13	0.721	428.34	-----	-----	-----	-----	-----	-----	-----	-----	2.017	2.017
19.17	0.718	428.32	-----	-----	-----	-----	-----	-----	-----	-----	2.007	2.007
19.20	0.715	428.31	-----	-----	-----	-----	-----	-----	-----	-----	1.998	1.998
19.23	0.711	428.29	-----	-----	-----	-----	-----	-----	-----	-----	1.988	1.988
19.27	0.708	428.28	-----	-----	-----	-----	-----	-----	-----	-----	1.979	1.979
19.30	0.704	428.26	-----	-----	-----	-----	-----	-----	-----	-----	1.969	1.969
19.33	0.701	428.25	-----	-----	-----	-----	-----	-----	-----	-----	1.960	1.960
19.37	0.697	428.23	-----	-----	-----	-----	-----	-----	-----	-----	1.951	1.951
19.40	0.694	428.22	-----	-----	-----	-----	-----	-----	-----	-----	1.942	1.942
19.43	0.690	428.21	-----	-----	-----	-----	-----	-----	-----	-----	1.933	1.933
19.47	0.687	428.19	-----	-----	-----	-----	-----	-----	-----	-----	1.924	1.924
19.50	0.683	428.18	-----	-----	-----	-----	-----	-----	-----	-----	1.914	1.914
19.53	0.680	428.16	-----	-----	-----	-----	-----	-----	-----	-----	1.905	1.905
19.57	0.676	428.15	-----	-----	-----	-----	-----	-----	-----	-----	1.896	1.896
19.60	0.673	428.13	-----	-----	-----	-----	-----	-----	-----	-----	1.888	1.888
19.63	0.669	428.12	-----	-----	-----	-----	-----	-----	-----	-----	1.879	1.879
19.67	0.666	428.10	-----	-----	-----	-----	-----	-----	-----	-----	1.870	1.870
19.70	0.662	428.09	-----	-----	-----	-----	-----	-----	-----	-----	1.861	1.861
19.73	0.659	428.08	-----	-----	-----	-----	-----	-----	-----	-----	1.852	1.852
19.77	0.655	428.06	-----	-----	-----	-----	-----	-----	-----	-----	1.843	1.843
19.80	0.652	428.05	-----	-----	-----	-----	-----	-----	-----	-----	1.835	1.835
19.83	0.648	428.03	-----	-----	-----	-----	-----	-----	-----	-----	1.826	1.826
19.87	0.645	428.02	-----	-----	-----	-----	-----	-----	-----	-----	1.817	1.817
19.90	0.641	428.01	-----	-----	-----	-----	-----	-----	-----	-----	1.809	1.809
19.93	0.638	427.99	-----	-----	-----	-----	-----	-----	-----	-----	1.782	1.782
19.97	0.634	427.96	-----	-----	-----	-----	-----	-----	-----	-----	1.739	1.739

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.00	0.631	427.94	-----	-----	-----	-----	-----	-----	-----	-----	1.698	1.698
20.03	0.627	427.92	-----	-----	-----	-----	-----	-----	-----	-----	1.658	1.658
20.07	0.624	427.90	-----	-----	-----	-----	-----	-----	-----	-----	1.619	1.619
20.10	0.620	427.88	-----	-----	-----	-----	-----	-----	-----	-----	1.582	1.582
20.13	0.617	427.86	-----	-----	-----	-----	-----	-----	-----	-----	1.546	1.546
20.17	0.613	427.84	-----	-----	-----	-----	-----	-----	-----	-----	1.511	1.511
20.20	0.610	427.82	-----	-----	-----	-----	-----	-----	-----	-----	1.477	1.477
20.23	0.607	427.80	-----	-----	-----	-----	-----	-----	-----	-----	1.445	1.445
20.27	0.603	427.78	-----	-----	-----	-----	-----	-----	-----	-----	1.413	1.413
20.30	0.600	427.77	-----	-----	-----	-----	-----	-----	-----	-----	1.383	1.383
20.33	0.597	427.75	-----	-----	-----	-----	-----	-----	-----	-----	1.353	1.353
20.37	0.594	427.73	-----	-----	-----	-----	-----	-----	-----	-----	1.325	1.325
20.40	0.591	427.72	-----	-----	-----	-----	-----	-----	-----	-----	1.298	1.298
20.43	0.589	427.70	-----	-----	-----	-----	-----	-----	-----	-----	1.271	1.271
20.47	0.586	427.69	-----	-----	-----	-----	-----	-----	-----	-----	1.245	1.245
20.50	0.583	427.68	-----	-----	-----	-----	-----	-----	-----	-----	1.221	1.221
20.53	0.581	427.66	-----	-----	-----	-----	-----	-----	-----	-----	1.197	1.197
20.57	0.579	427.65	-----	-----	-----	-----	-----	-----	-----	-----	1.174	1.174
20.60	0.577	427.64	-----	-----	-----	-----	-----	-----	-----	-----	1.151	1.151
20.63	0.575	427.63	-----	-----	-----	-----	-----	-----	-----	-----	1.130	1.130
20.67	0.573	427.61	-----	-----	-----	-----	-----	-----	-----	-----	1.109	1.109
20.70	0.571	427.60	-----	-----	-----	-----	-----	-----	-----	-----	1.089	1.089
20.73	0.570	427.59	-----	-----	-----	-----	-----	-----	-----	-----	1.069	1.069
20.77	0.568	427.58	-----	-----	-----	-----	-----	-----	-----	-----	1.051	1.051
20.80	0.567	427.57	-----	-----	-----	-----	-----	-----	-----	-----	1.033	1.033
20.83	0.565	427.56	-----	-----	-----	-----	-----	-----	-----	-----	1.015	1.015
20.87	0.564	427.55	-----	-----	-----	-----	-----	-----	-----	-----	0.998	0.998
20.90	0.563	427.54	-----	-----	-----	-----	-----	-----	-----	-----	0.982	0.982

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.93	0.562	427.54	-----	-----	-----	-----	-----	-----	-----	-----	0.966	0.966
20.97	0.561	427.53	-----	-----	-----	-----	-----	-----	-----	-----	0.951	0.951
21.00	0.560	427.52	-----	-----	-----	-----	-----	-----	-----	-----	0.936	0.936
21.03	0.560	427.51	-----	-----	-----	-----	-----	-----	-----	-----	0.922	0.922
21.07	0.559	427.50	-----	-----	-----	-----	-----	-----	-----	-----	0.909	0.909
21.10	0.558	427.50	-----	-----	-----	-----	-----	-----	-----	-----	0.896	0.896
21.13	0.557	427.49	-----	-----	-----	-----	-----	-----	-----	-----	0.883	0.883
21.17	0.557	427.48	-----	-----	-----	-----	-----	-----	-----	-----	0.871	0.871
21.20	0.556	427.48	-----	-----	-----	-----	-----	-----	-----	-----	0.859	0.859
21.23	0.555	427.47	-----	-----	-----	-----	-----	-----	-----	-----	0.848	0.848
21.27	0.555	427.46	-----	-----	-----	-----	-----	-----	-----	-----	0.837	0.837
21.30	0.554	427.46	-----	-----	-----	-----	-----	-----	-----	-----	0.826	0.826
21.33	0.553	427.45	-----	-----	-----	-----	-----	-----	-----	-----	0.816	0.816
21.37	0.553	427.45	-----	-----	-----	-----	-----	-----	-----	-----	0.806	0.806
21.40	0.552	427.44	-----	-----	-----	-----	-----	-----	-----	-----	0.797	0.797
21.43	0.551	427.44	-----	-----	-----	-----	-----	-----	-----	-----	0.787	0.787
21.47	0.551	427.43	-----	-----	-----	-----	-----	-----	-----	-----	0.779	0.779
21.50	0.550	427.43	-----	-----	-----	-----	-----	-----	-----	-----	0.770	0.770
21.53	0.550	427.42	-----	-----	-----	-----	-----	-----	-----	-----	0.762	0.762
21.57	0.549	427.42	-----	-----	-----	-----	-----	-----	-----	-----	0.754	0.754
21.60	0.548	427.41	-----	-----	-----	-----	-----	-----	-----	-----	0.746	0.746
21.63	0.548	427.41	-----	-----	-----	-----	-----	-----	-----	-----	0.739	0.739
21.67	0.547	427.41	-----	-----	-----	-----	-----	-----	-----	-----	0.731	0.731
21.70	0.546	427.40	-----	-----	-----	-----	-----	-----	-----	-----	0.725	0.725
21.73	0.546	427.40	-----	-----	-----	-----	-----	-----	-----	-----	0.718	0.718
21.77	0.545	427.39	-----	-----	-----	-----	-----	-----	-----	-----	0.711	0.711
21.80	0.544	427.39	-----	-----	-----	-----	-----	-----	-----	-----	0.705	0.705
21.83	0.544	427.39	-----	-----	-----	-----	-----	-----	-----	-----	0.699	0.699

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
21.87	0.543	427.38	-----	-----	-----	-----	-----	-----	-----	-----	0.693	0.693
21.90	0.542	427.38	-----	-----	-----	-----	-----	-----	-----	-----	0.688	0.688
21.93	0.542	427.38	-----	-----	-----	-----	-----	-----	-----	-----	0.682	0.682
21.97	0.541	427.38	-----	-----	-----	-----	-----	-----	-----	-----	0.677	0.677
22.00	0.540	427.37	-----	-----	-----	-----	-----	-----	-----	-----	0.672	0.672
22.03	0.540	427.37	-----	-----	-----	-----	-----	-----	-----	-----	0.667	0.667
22.07	0.539	427.37	-----	-----	-----	-----	-----	-----	-----	-----	0.662	0.662
22.10	0.538	427.36	-----	-----	-----	-----	-----	-----	-----	-----	0.657	0.657
22.13	0.538	427.36	-----	-----	-----	-----	-----	-----	-----	-----	0.653	0.653
22.17	0.537	427.36	-----	-----	-----	-----	-----	-----	-----	-----	0.649	0.649
22.20	0.536	427.36	-----	-----	-----	-----	-----	-----	-----	-----	0.644	0.644
22.23	0.536	427.35	-----	-----	-----	-----	-----	-----	-----	-----	0.640	0.640
22.27	0.535	427.35	-----	-----	-----	-----	-----	-----	-----	-----	0.636	0.636
22.30	0.534	427.35	-----	-----	-----	-----	-----	-----	-----	-----	0.633	0.633
22.33	0.534	427.35	-----	-----	-----	-----	-----	-----	-----	-----	0.629	0.629
22.37	0.533	427.35	-----	-----	-----	-----	-----	-----	-----	-----	0.625	0.625
22.40	0.532	427.34	-----	-----	-----	-----	-----	-----	-----	-----	0.622	0.622
22.43	0.532	427.34	-----	-----	-----	-----	-----	-----	-----	-----	0.619	0.619
22.47	0.531	427.34	-----	-----	-----	-----	-----	-----	-----	-----	0.615	0.615
22.50	0.530	427.34	-----	-----	-----	-----	-----	-----	-----	-----	0.612	0.612
22.53	0.530	427.34	-----	-----	-----	-----	-----	-----	-----	-----	0.609	0.609
22.57	0.529	427.34	-----	-----	-----	-----	-----	-----	-----	-----	0.606	0.606
22.60	0.529	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.603	0.603
22.63	0.528	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.600	0.600
22.67	0.527	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.598	0.598
22.70	0.527	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.595	0.595
22.73	0.526	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.592	0.592
22.77	0.525	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.590	0.590

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.80	0.525	427.33	-----	-----	-----	-----	-----	-----	-----	-----	0.587	0.587
22.83	0.524	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.585	0.585
22.87	0.523	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.583	0.583
22.90	0.523	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.581	0.581
22.93	0.522	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.578	0.578
22.97	0.521	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.576	0.576
23.00	0.521	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.574	0.574
23.03	0.520	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.572	0.572
23.07	0.519	427.32	-----	-----	-----	-----	-----	-----	-----	-----	0.570	0.570
23.10	0.519	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.568	0.568
23.13	0.518	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.566	0.566
23.17	0.517	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.565	0.565
23.20	0.517	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.563	0.563
23.23	0.516	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.561	0.561
23.27	0.515	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.559	0.559
23.30	0.515	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.558	0.558
23.33	0.514	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.556	0.556
23.37	0.513	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.554	0.554
23.40	0.513	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.553	0.553
23.43	0.512	427.31	-----	-----	-----	-----	-----	-----	-----	-----	0.551	0.551
23.47	0.511	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.550	0.550
23.50	0.510	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.548	0.548
23.53	0.510	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.547	0.547
23.57	0.509	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.546	0.546
23.60	0.508	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.544	0.544
23.63	0.508	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.543	0.543
23.67	0.507	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.541	0.542
23.70	0.506	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.540	0.540

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
23.73	0.506	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.539	0.539
23.77	0.505	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.538	0.538
23.80	0.504	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.536	0.536
23.83	0.504	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.535	0.535
23.87	0.503	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.534	0.534
23.90	0.502	427.30	-----	-----	-----	-----	-----	-----	-----	-----	0.533	0.533
23.93	0.502	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.532	0.532
23.97	0.501	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.531	0.531
24.00	0.500	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.529	0.529
24.03	0.498	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.528	0.528
24.07	0.494	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.527	0.527
24.10	0.489	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.526	0.526
24.13	0.483	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.524	0.524
24.17	0.474	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.523	0.523
24.20	0.465	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.521	0.521
24.23	0.453	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.518	0.518
24.27	0.441	427.29	-----	-----	-----	-----	-----	-----	-----	-----	0.516	0.516
24.30	0.427	427.28	-----	-----	-----	-----	-----	-----	-----	-----	0.513	0.513
24.33	0.411	427.28	-----	-----	-----	-----	-----	-----	-----	-----	0.509	0.509
24.37	0.394	427.28	-----	-----	-----	-----	-----	-----	-----	-----	0.505	0.505
24.40	0.375	427.28	-----	-----	-----	-----	-----	-----	-----	-----	0.501	0.501
24.43	0.355	427.27	-----	-----	-----	-----	-----	-----	-----	-----	0.495	0.495
24.47	0.333	427.27	-----	-----	-----	-----	-----	-----	-----	-----	0.490	0.490
24.50	0.310	427.27	-----	-----	-----	-----	-----	-----	-----	-----	0.483	0.483
24.53	0.285	427.26	-----	-----	-----	-----	-----	-----	-----	-----	0.476	0.477
24.57	0.259	427.26	-----	-----	-----	-----	-----	-----	-----	-----	0.469	0.469
24.60	0.235	427.26	-----	-----	-----	-----	-----	-----	-----	-----	0.461	0.461
24.63	0.211	427.25	-----	-----	-----	-----	-----	-----	-----	-----	0.452	0.452

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
24.67	0.189	427.25	-----	-----	-----	-----	-----	-----	-----	-----	0.442	0.442
24.70	0.168	427.24	-----	-----	-----	-----	-----	-----	-----	-----	0.432	0.432
24.73	0.148	427.23	-----	-----	-----	-----	-----	-----	-----	-----	0.422	0.422
24.77	0.129	427.23	-----	-----	-----	-----	-----	-----	-----	-----	0.411	0.411
24.80	0.112	427.22	-----	-----	-----	-----	-----	-----	-----	-----	0.401	0.401
24.83	0.096	427.22	-----	-----	-----	-----	-----	-----	-----	-----	0.389	0.389
24.87	0.081	427.21	-----	-----	-----	-----	-----	-----	-----	-----	0.378	0.378
24.90	0.068	427.20	-----	-----	-----	-----	-----	-----	-----	-----	0.367	0.367
24.93	0.055	427.20	-----	-----	-----	-----	-----	-----	-----	-----	0.355	0.355
24.97	0.044	427.19	-----	-----	-----	-----	-----	-----	-----	-----	0.344	0.344
25.00	0.034	427.18	-----	-----	-----	-----	-----	-----	-----	-----	0.333	0.332
25.03	0.026	427.18	-----	-----	-----	-----	-----	-----	-----	-----	0.321	0.321
25.07	0.018	427.17	-----	-----	-----	-----	-----	-----	-----	-----	0.310	0.310
25.10	0.012	427.17	-----	-----	-----	-----	-----	-----	-----	-----	0.299	0.299
25.13	0.007	427.16	-----	-----	-----	-----	-----	-----	-----	-----	0.288	0.288
25.17	0.004	427.15	-----	-----	-----	-----	-----	-----	-----	-----	0.277	0.277
25.20	0.001	427.15	-----	-----	-----	-----	-----	-----	-----	-----	0.267	0.267
25.23	0.000	427.14	-----	-----	-----	-----	-----	-----	-----	-----	0.257	0.257
25.27	0.000	427.14	-----	-----	-----	-----	-----	-----	-----	-----	0.248	0.248
25.30	0.000	427.13	-----	-----	-----	-----	-----	-----	-----	-----	0.238	0.238
25.33	0.000	427.13	-----	-----	-----	-----	-----	-----	-----	-----	0.229	0.229
25.37	0.000	427.12	-----	-----	-----	-----	-----	-----	-----	-----	0.221	0.221
25.40	0.000	427.12	-----	-----	-----	-----	-----	-----	-----	-----	0.213	0.213
25.43	0.000	427.11	-----	-----	-----	-----	-----	-----	-----	-----	0.205	0.205
25.47	0.000	427.11	-----	-----	-----	-----	-----	-----	-----	-----	0.197	0.197
25.50	0.000	427.11	-----	-----	-----	-----	-----	-----	-----	-----	0.189	0.190
25.53	0.000	427.10	-----	-----	-----	-----	-----	-----	-----	-----	0.182	0.182
25.57	0.000	427.10	-----	-----	-----	-----	-----	-----	-----	-----	0.176	0.176

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
25.60	0.000	427.09	-----	-----	-----	-----	-----	-----	-----	-----	0.169	0.169
25.63	0.000	427.09	-----	-----	-----	-----	-----	-----	-----	-----	0.163	0.163
25.67	0.000	427.09	-----	-----	-----	-----	-----	-----	-----	-----	0.157	0.157
25.70	0.000	427.08	-----	-----	-----	-----	-----	-----	-----	-----	0.151	0.151
25.73	0.000	427.08	-----	-----	-----	-----	-----	-----	-----	-----	0.145	0.145
25.77	0.000	427.08	-----	-----	-----	-----	-----	-----	-----	-----	0.140	0.140
25.80	0.000	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.134	0.134
25.83	0.000	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.129	0.129
25.87	0.000	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.125	0.125
25.90	0.000	427.07	-----	-----	-----	-----	-----	-----	-----	-----	0.120	0.120
25.93	0.000	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.115	0.115
25.97	0.000	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.111	0.111
26.00	0.000	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.107	0.107
26.03	0.000	427.06	-----	-----	-----	-----	-----	-----	-----	-----	0.103	0.103
26.07	0.000	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.099	0.099
26.10	0.000	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.095	0.095
26.13	0.000	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.092	0.092
26.17	0.000	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.088	0.088
26.20	0.000	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.085	0.085
26.23	0.000	427.05	-----	-----	-----	-----	-----	-----	-----	-----	0.082	0.082
26.27	0.000	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.079	0.079
26.30	0.000	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.076	0.076
26.33	0.000	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.073	0.073
26.37	0.000	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.070	0.070
26.40	0.000	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.068	0.068
26.43	0.000	427.04	-----	-----	-----	-----	-----	-----	-----	-----	0.065	0.065
26.47	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.063	0.063
26.50	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.060	0.060

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EX. RETENTION BASIN, D

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
26.53	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.058	0.058
26.57	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.056	0.056
26.60	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.054	0.054
26.63	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.052	0.052
26.67	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.050	0.050
26.70	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.048	0.048
26.73	0.000	427.03	-----	-----	-----	-----	-----	-----	-----	-----	0.046	0.046
26.77	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.044	0.044
26.80	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.043	0.043
26.83	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.041	0.041
26.87	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.040	0.040
26.90	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.038	0.038
26.93	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.037	0.037
26.97	0.000	427.02	-----	-----	-----	-----	-----	-----	-----	-----	0.035	0.035

...End

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Pond No. 1 - EX. RETENTION BASIN,D

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 447.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	427.00	3,099	0	0
1.00	428.00	8,720	5,672	5,672
2.00	429.00	11,734	10,189	15,861
3.00	430.00	14,542	13,112	28,973
4.00	431.00	17,286	15,893	44,865
5.00	432.00	20,237	18,740	63,605
6.00	433.00	23,479	21,836	85,441

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 447.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 8.940 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	427.00	---	---	---	---	---	---	---	---	0.000	---	0.000
0.10	567	427.10	---	---	---	---	---	---	---	---	0.180	---	0.180
0.20	1,134	427.20	---	---	---	---	---	---	---	---	0.361	---	0.361
0.30	1,702	427.30	---	---	---	---	---	---	---	---	0.541	---	0.541
0.40	2,269	427.40	---	---	---	---	---	---	---	---	0.722	---	0.722
0.50	2,836	427.50	---	---	---	---	---	---	---	---	0.902	---	0.902
0.60	3,403	427.60	---	---	---	---	---	---	---	---	1.083	---	1.083
0.70	3,971	427.70	---	---	---	---	---	---	---	---	1.263	---	1.263
0.80	4,538	427.80	---	---	---	---	---	---	---	---	1.444	---	1.444
0.90	5,105	427.90	---	---	---	---	---	---	---	---	1.624	---	1.624
1.00	5,672	428.00	---	---	---	---	---	---	---	---	1.805	---	1.805
1.10	6,691	428.10	---	---	---	---	---	---	---	---	1.867	---	1.867
1.20	7,710	428.20	---	---	---	---	---	---	---	---	1.929	---	1.929
1.30	8,729	428.30	---	---	---	---	---	---	---	---	1.992	---	1.992
1.40	9,748	428.40	---	---	---	---	---	---	---	---	2.054	---	2.054
1.50	10,767	428.50	---	---	---	---	---	---	---	---	2.116	---	2.116
1.60	11,786	428.60	---	---	---	---	---	---	---	---	2.179	---	2.179
1.70	12,804	428.70	---	---	---	---	---	---	---	---	2.241	---	2.241
1.80	13,823	428.80	---	---	---	---	---	---	---	---	2.304	---	2.304
1.90	14,842	428.90	---	---	---	---	---	---	---	---	2.366	---	2.366
2.00	15,861	429.00	---	---	---	---	---	---	---	---	2.428	---	2.428
2.10	17,172	429.10	---	---	---	---	---	---	---	---	2.486	---	2.486
2.20	18,483	429.20	---	---	---	---	---	---	---	---	2.544	---	2.544
2.30	19,795	429.30	---	---	---	---	---	---	---	---	2.603	---	2.603
2.40	21,106	429.40	---	---	---	---	---	---	---	---	2.661	---	2.661
2.50	22,417	429.50	---	---	---	---	---	---	---	---	2.719	---	2.719
2.60	23,728	429.60	---	---	---	---	---	---	---	---	2.777	---	2.777
2.70	25,039	429.70	---	---	---	---	---	---	---	---	2.835	---	2.835
2.80	26,350	429.80	---	---	---	---	---	---	---	---	2.893	---	2.893
2.90	27,662	429.90	---	---	---	---	---	---	---	---	2.951	---	2.951
3.00	28,973	430.00	---	---	---	---	---	---	---	---	3.009	---	3.009
3.10	30,562	430.10	---	---	---	---	---	---	---	---	3.066	---	3.066
3.20	32,151	430.20	---	---	---	---	---	---	---	---	3.123	---	3.123
3.30	33,740	430.30	---	---	---	---	---	---	---	---	3.180	---	3.180
3.40	35,330	430.40	---	---	---	---	---	---	---	---	3.236	---	3.236
3.50	36,919	430.50	---	---	---	---	---	---	---	---	3.293	---	3.293

Continues on next page...

EX. RETENTION BASIN,D

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	38,508	430.60	---	---	---	---	---	---	---	---	3.350	---	3.350
3.70	40,097	430.70	---	---	---	---	---	---	---	---	3.407	---	3.407
3.80	41,687	430.80	---	---	---	---	---	---	---	---	3.464	---	3.464
3.90	43,276	430.90	---	---	---	---	---	---	---	---	3.520	---	3.520
4.00	44,865	431.00	---	---	---	---	---	---	---	---	3.577	---	3.577
4.10	46,739	431.10	---	---	---	---	---	---	---	---	3.638	---	3.638
4.20	48,613	431.20	---	---	---	---	---	---	---	---	3.699	---	3.699
4.30	50,487	431.30	---	---	---	---	---	---	---	---	3.760	---	3.760
4.40	52,361	431.40	---	---	---	---	---	---	---	---	3.821	---	3.821
4.50	54,235	431.50	---	---	---	---	---	---	---	---	3.883	---	3.883
4.60	56,109	431.60	---	---	---	---	---	---	---	---	3.944	---	3.944
4.70	57,983	431.70	---	---	---	---	---	---	---	---	4.005	---	4.005
4.80	59,857	431.80	---	---	---	---	---	---	---	---	4.066	---	4.066
4.90	61,731	431.90	---	---	---	---	---	---	---	---	4.127	---	4.127
5.00	63,605	432.00	---	---	---	---	---	---	---	---	4.188	---	4.188
5.10	65,789	432.10	---	---	---	---	---	---	---	---	4.255	---	4.255
5.20	67,972	432.20	---	---	---	---	---	---	---	---	4.322	---	4.322
5.30	70,156	432.30	---	---	---	---	---	---	---	---	4.389	---	4.389
5.40	72,340	432.40	---	---	---	---	---	---	---	---	4.456	---	4.456
5.50	74,523	432.50	---	---	---	---	---	---	---	---	4.523	---	4.523
5.60	76,707	432.60	---	---	---	---	---	---	---	---	4.590	---	4.590
5.70	78,890	432.70	---	---	---	---	---	---	---	---	4.657	---	4.657
5.80	81,074	432.80	---	---	---	---	---	---	---	---	4.725	---	4.725
5.90	83,257	432.90	---	---	---	---	---	---	---	---	4.792	---	4.792
6.00	85,441	433.00	---	---	---	---	---	---	---	---	4.859	---	4.859

...End

Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

ne: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38709 & 38710\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

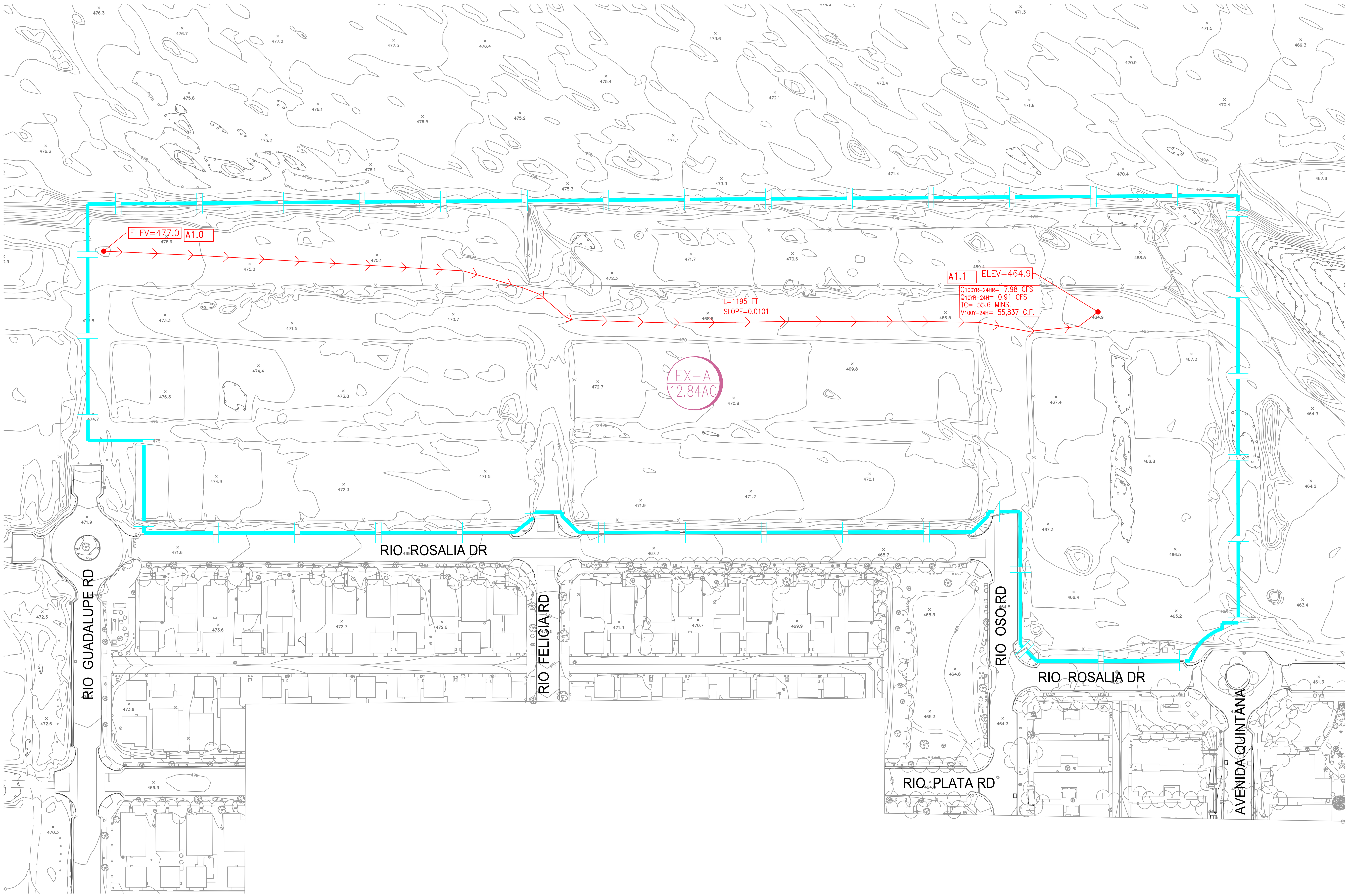
APPENDIX 5

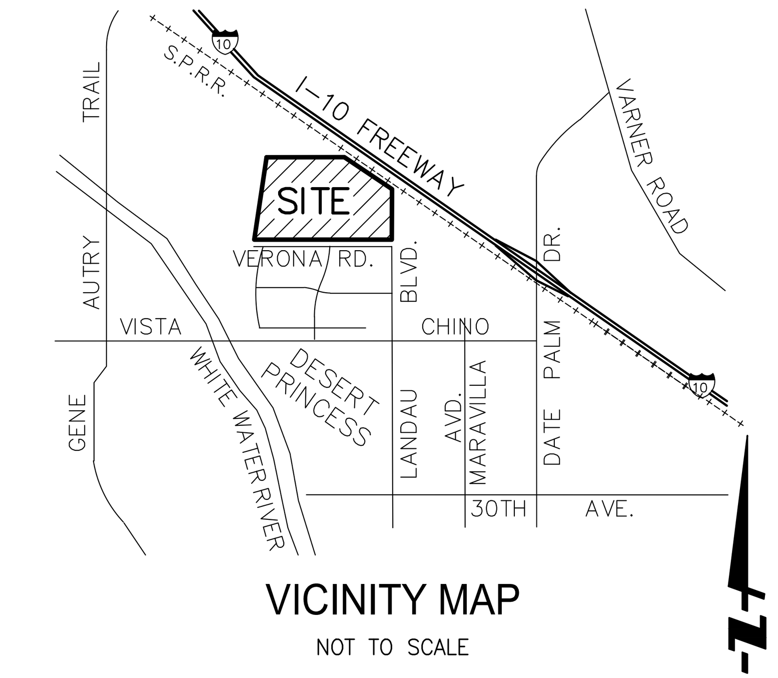
HYDROLOGY MAPS – PRE/POST DEVELOPMENT HYDROLOGY MAPS

PRE-DEVELOPMENT DRAINAGE MAP

CATHEDRAL CITY, CA

TTM - 38709 & 38710





VICINITY MAP

NOT TO SCALE

ASSESSORS PARCEL NUMBERS:

APN: 677-050-027, 677-050-034

OWNER/DEVELOPER:

NCP VERANO, LLC
690 E GREEN STREET, SUITE 200
PASADENA, CA 91101
(323)874-8000

CIVIL ENGINEER:

FUSCOE ENGEERING, INC.
2850 INLAND EMPIRE BLVD, SUITE B
ONTARIO, CA 91764
(909)581-0676

LEGEND

AREA BOUNDARY

SUB AREA
DA
AC
SUB-AREA (ACRES)
AREA NODE

FLOW

DRAINAGE AREA SUMMARY				
DRAINAGE AREA	AREA, AC	IMPERVIOUS AREA, AC	% IMP	CN
EX-A	12.84	0.00	0.00	65

60' 0' 30' 60'

SCALE: 1" = 60'

PREPARED BY:

JUNE, 2023

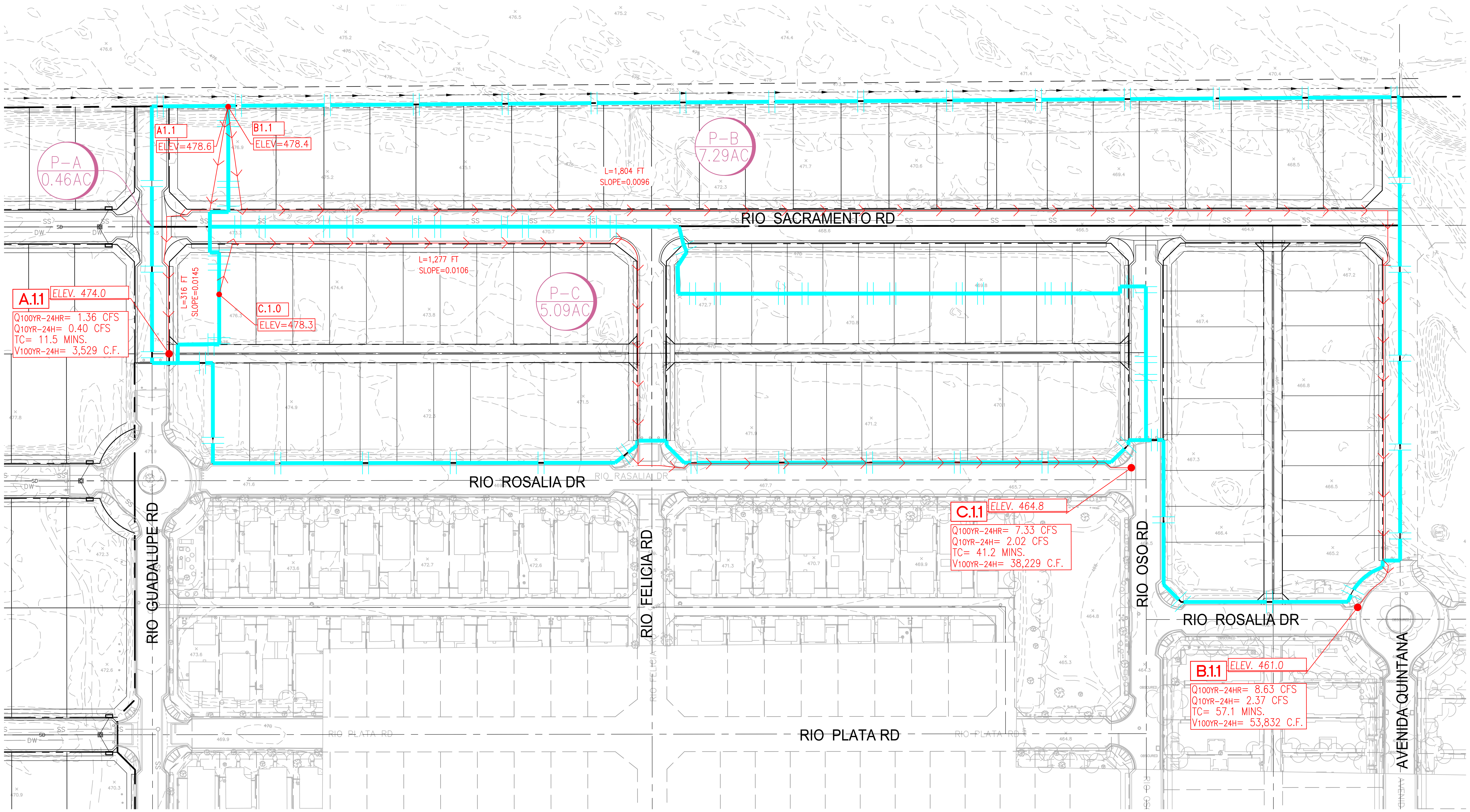
FUSCOE ENGINEERING

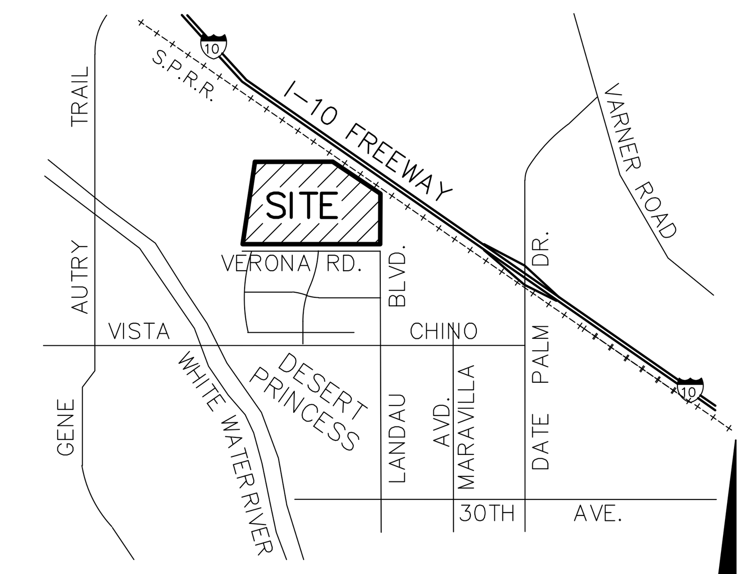
full circle thinking

POST-DEVELOPMENT DRAINAGE MAP

CATHEDRAL CITY, CA

TTM - 38709 & 38710





VICINITY MAP

NOT TO SCALE

ASSESSORS PARCEL NUMBERS:

APN: 677-050-027, 677-050-034

OWNER/DEVELOPER:

NCP VERANO, LLC
690 E GREEN STREET, SUITE 200
PASADENA, CA 91101
(323)874-8000

CIVIL ENGINEER:

FUSCOE ENGEERING, INC.
2850 INLAND EMPIRE BLVD, SUITE B
ONTARIO, CA 91764
(909)581-0676

LEGEND

AREA BOUNDARY

SUB AREA
DA
AC
SUB-AREA (ACRES)
AREA NODE

FLOW

DRAINAGE AREA SUMMARY							
DRAINAGE AREA	AREA, AC	IMPERVIOUS AREA, AC	% IMP	CN	POINT OF DISCHARGE	V100YR-24HR (CU.FT.)	Q100YR-24HR (CFS)
P-A	0.46	0.30	0.65	77	A.1.1 @ RIO GUADALUPE ROAD	3,529	1.36
P-B	7.29	4.74	0.65	77	B.1.1 @ ROSALIA DR & AVENIDA QUINTANA	53,832	8.63
P-C	5.09	3.31	0.65	77	C.1.1 @ RIO OSO ROAD	38,229	7.33
TOTAL	12.84	8.35	0.65	77		95,590	17.32
DIFFERENCE PRE VS POST, V100YR-24HR (CU.FT.)						39,753	
*PRO-RATED VOLUME PROVIDED PER M-WQMP FOR RIO VISTA VILLAGE AT RETENTION BASIN, D						51,183	
AFTER RETENTION: Q100YR-24HR (POST), CFS						3.46	

* TOTAL VOLUME CAPACITY OF EXISTING RETENTION BASIN D IS 129,808 CU.FT. PER THE M-WQMP FOR RIO VISTA VILLAGE (2001).

60' 0' 30' 60'

SCALE: 1" = 60'

PREPARED BY:

JUNE, 2023

FUSCOE ENGINEERING

full circle thinking

APPENDIX 6

EXCERTPS FROM APPROVED MASTER DRAINAGE REPORT FOR TRACT 28639-1 FOR RIO VISTA VILLAGE DATED MAY 4, 2001
(FOR REFERENCE ONLY)

DRAINAGE REPORT

TRACT 28639-1

RIO VISTA VILLAGE
City of Cathedral City, California

Prepared for

BURNETT COMPANIES

REGISTERED PROFESSIONAL ENGINEER
JULIAN A. DE LA TORRE
NO. 43880
exp. 6-30-01
CIVIL
STATE OF CALIFORNIA

Revised May 4, 2001

Prepared by

MAINIERO, SMITH AND ASSOCIATES, INC.
PLANNING / CIVIL ENGINEERING / LAND SURVEYING
777 East Tahquitz Canyon Way, Suite 301, Palm Springs, CA 92262
Telephone (760) 320-9811 / FAX (760) 323-7893 / www.mainierosmith.com

Project Description

The Rio Vista Village (development) watershed is generally bounded by the Southern Pacific Railroad right-of-way on the north, Verona Road to the south, Landau Boulevard on the east, and the Morongo Creek Stormwater Channel on the west (see Figure 1). Tract 28639-1 (project) occupies the eastern two-thirds of the Rio Vista Village development (see Figure 2).

Existing Hydrology and Flood Control Improvements

The Rio Vista Village watershed consists of undeveloped, flat desert terrain sloping in a southeasterly direction (see Figure 1).

An unlined earthen channel/levee system known as the Morongo Creek Stormwater Channel runs along the west side of the development. It is assumed that the existing facility will intercept and convey the tributary offsite storm flows.

Rio Vista Village Master Plan of Drainage

The Rio Vista Village Master Plan of Drainage and the Rio Vista Village Master Plan of Drainage Alternative were prepared by AEI-CASC Engineering in May of 2000. The two Master Plans and the Mass Grading Plan for the development were approved on August 24, 2000. The Master Drainage Plan Alternative was prepared to identify the advantages of conveying storm flows within the street right-of-way and public utility easement (P.U.C.). These Master Plans were used as a planning tool to collect and convey the 100-year storm flows associated with the final improvements of Tract 28639-1.

Hydrology and Hydraulic Methods

The City of Cathedral City has local flood control jurisdiction and has required that Rio Vista Village retain 100% of the 100-year, 24-hour storm that falls within the site. In addition, the 10-year storm flows shall not exceed the top of curb and the 100-year storm flows shall not exceed the public utility easement (located 10-feet outside the proposed curb).

The Rational Method Hydrology computer program, Version 1.5A was used to determine the peak flows during the10-year and 100-year, 1-hour storm events. Soil Type "A" was used throughout the analysis. Development types were interpreted from the "Land Used Plan" provided in the Specific Plan for this development (see Figure 3). 60-foot, 58-foot and some 48-foot wide lots with park areas were grouped into the 50-percent impervious category, while 38-foot and most 48-foot wide lots where grouped into the 65-percent impervious category. Park areas were considered to be 40-percent impervious and retention basin 15-percent impervious. The Rational Method program uses a County of Riverside standard curb when determining the depth of flow in the streets. The majority of the project streets have a wedge curb. The wedge curb, in combination with the typical street cross section, has the capacity to convey more flow at top of curb than the standard curb street. Figures 4 & 5 indicate the formula to determine the curb capacity based on the street width and slope. Using street slope from the Street Improvement Plans the true street capacity is indicated next to the appropriate Rational Method section. For Rational Method sections where no depth of flow is given, separate Rational Method calculations were performed, using flow, slope and street width. These calculations are not included in this report but can be provided for reference, if needed. The 10-year storm does not exceed the top of curb. The 100-year storm does not exceed the public utility easement (see Figures 6-10 for typical street sections and wedge curb detail). There are small drain boxes and small drain lines around Rio Vista Drive. These facilities are intended to pick-up nuisance flows while storm flows are assumed to flow-by. These facilities are not incorporated in the Rational Method or Storm Drain Analysis (see the Proposed Hydrology Map).

The Unit-Hydrograph Analysis computer program based on the 1978 RCFC&WCD Hydrology Manual was used to determine the runoff volume tributary to the proposed retention basins during the 100-year, 24-hour storm event. Figures 11-21 indicate the eleven drainage areas covered in this report. See Figure 22 for the Unit Hydrograph Summary Chart that identifies the characteristics of each drainage area. 100-percent of the 100-year, 24-hour storm runoff is captured and retained by the proposed retention basins. Figures 23-44 represent the retention capacity and shape of each retention basin. The 100-year, 1-hour runoff volume (hgl) and the 100-year, 24-hour runoff volume are also indicated on these figures.

The Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade Line in Retention Basins was used to determine the hydraulic grade line at the outlet of each storm drain system. This hydrologic method was proposed to the City of Cathedral City in an effort to establish a beginning hydraulic grade line for the storm drain systems of Rio Vista Village during the peak runoff of the 100-year, 1-hour storm. This method was approved by Dave Feassel (City Engineer) on March 7, 2001. A Simplified Method is provided for each drainage area (see Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade Line in Retention Basins).

The Eagle Point Storm Sewer Analysis program was used to determine the hydraulic grade line of the proposed storm drain system. The storm sewer line information is taken from the Storm Drain Improvement Plans for Tract 28639-1. The storm drain flow information is taken from the Rational Method results. The Storm Sewer Analysis program represents the storm drain system as a series of connected lines and manholes. Lines represent the storm drains, and manholes represent catch basins, manholes, junction structures and deflection angles (see Storm Drain System Hydraulics).

The Catch Basin Capacity Charts were used to determine the required catch basin openings in the 100-year storm. The 100-year peak runoff and depth of flow was taken from the Rational Method results. The catch basins are sized to capture the 100-percent of the 100-year flows (see Catch Basin Calculations).

Proposed Flood Control Improvements

Proposed flood control improvement for the eleven drainage areas, as shown on Figures 11-21, consists of the following:

Drainage Area "B" – Retention Area "B" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm Drain Line B-1 (33", 27" & 24"), B-2 (18") and B-3 (18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans (copy attached).

Drainage Area "C" – Retention Area "C" is constructed in accordance with the Construction Phase 4 Precise Grading Plans for Rio Vista Village. Storm Drain Line C-1 (24" & 18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "D" – Retention Area "D" is constructed in accordance with the Construction Phase 3 Precise Grading Plans for Rio Vista Village. Storm Drain Line D-1 (42", 33" & 27"), D-2 (27" & 21") and D-3 (24") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "E" – Retention Area "E" is constructed in accordance with the Construction Phase 3 Precise Grading Plans for Rio Vista Village. Storm Drain Line E-1 (30" & 24") and E-2 (18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "F" – Retention Area "F" is constructed in accordance with the Construction Phase 2 Precise Grading Plans for Rio Vista Village. Storm Drain Line F-1 (24" & 21") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "G" – Retention Area "G" is constructed in accordance with the Construction Phase 1B Precise Grading Plans for Rio Vista Village. Storm Drain Line G-1 (30", 24" & 18") and G-2 (18") are constructed per the Storm Drain

Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "H1" – Retention Area "H1" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm Drain Line H1-1 (24" & 18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "H2" – Retention Area "H2" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm drain facilities are not required at this time.

Drainage Area "H4" – Retention Area "H4" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm drain facilities are not required at this time.

Drainage Area "I" – Retention Area "I" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm Drain Line I-1 (24") is constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

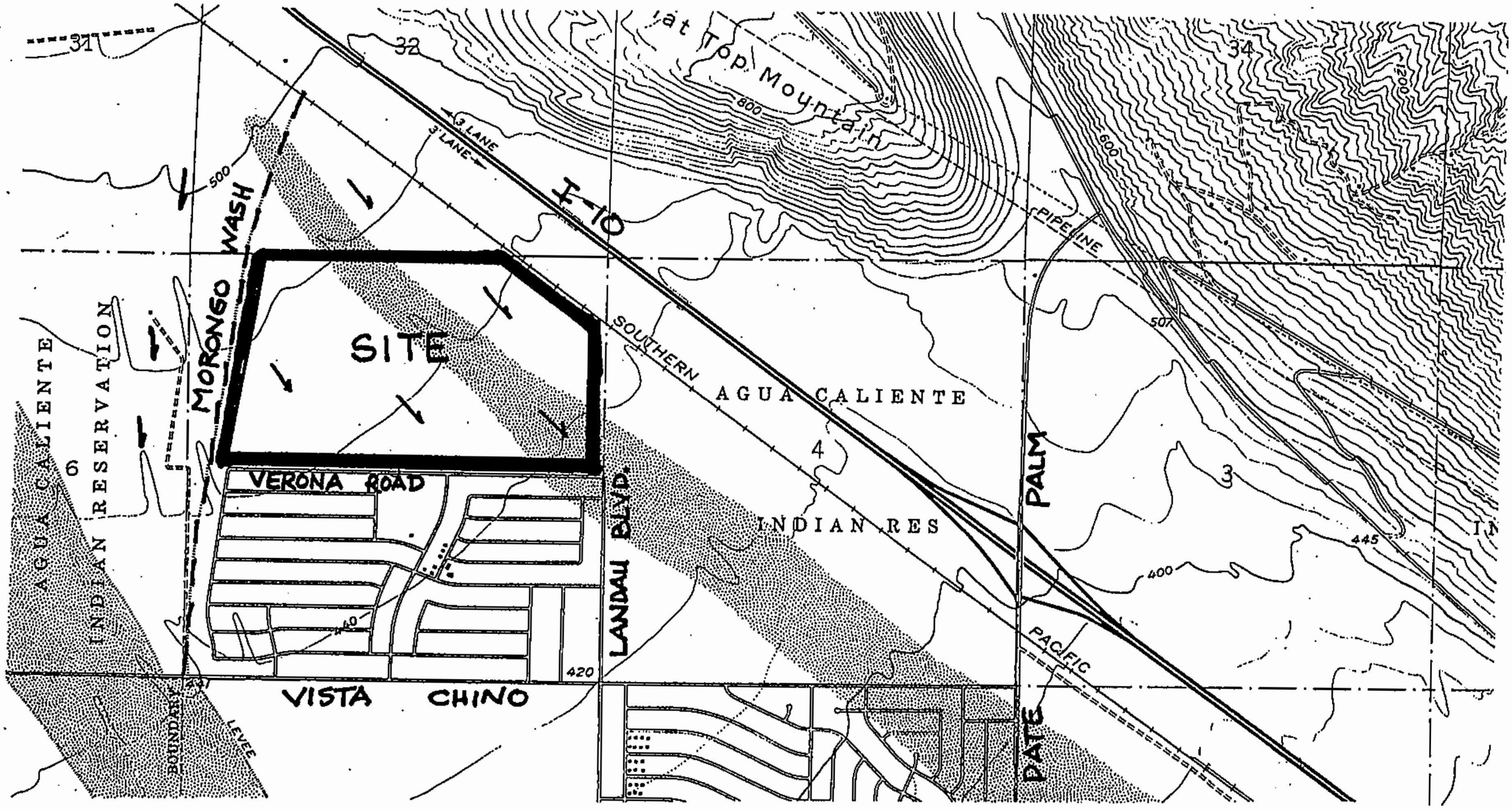
Drainage Area "K2" – Retention Area "B" is constructed in accordance with the Beach Club Precise Grading Plan for Rio Vista Village. Storm Drain Line K2-1 (30" & 27") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Conclusions

Based on results of this Drainage Report, it is concluded that:

1. Implementation of the proposed drainage facilities, as shown in this report, will provide Tract 28639-1 with 100-year flood protection from storm flows generated onsite.
2. The onsite 100-year storm flows will be intercepted and conveyed safely through proposed drainage facilities. These storm flows will be retained within the proposed retention basins.
3. In the event of storms larger than 100-year event, storm runoff will exceed the capacity of the retention basins, pond and safely overflow to Landau Boulevard.

Figures



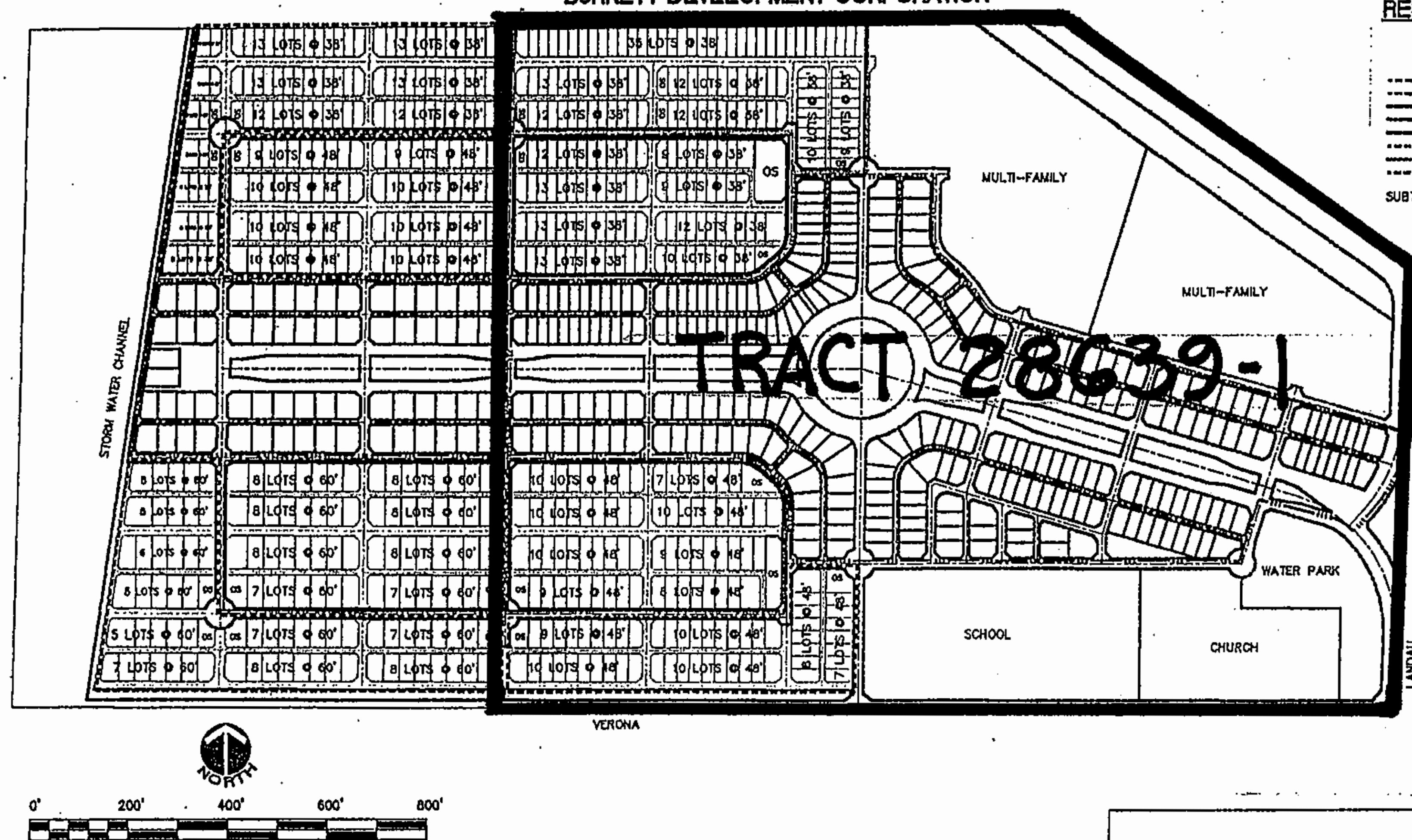
VICINITY MAP

Figure 1

TENTATIVE TRACT MAP NO. 28639

RIO VISTA VILLAGE

BURNETT DEVELOPMENT CORPORATION



RESIDENTIAL LOT ANALYSIS

LEGEND

Future Residential Lots	Open Space (OS)
54 LOTS @ 48'	.35 ACRES
63 LOTS @ 60'	.51 ACRES
62 LOTS @ 60'	.44 ACRES
73 LOTS @ 48'	.83 ACRES
91 LOTS @ 38'	.90 ACRES
78 LOTS @ 48'	.31 ACRES
103 LOTS @ 38'	.37 ACRES
97 LOTS @ 38'	.35 ACRES
SUBTOTAL 621 LOTS	4.06 ACRES

291 LOTS @ 38'
205 LOTS @ 48'
125 LOTS @ 60'

PHASE ONE
RESIDENTIAL LOTS = 268

PHASE TWO
RESIDENTIAL LOTS = 64

SUBTOTAL RESIDENTIAL LOTS
PHASE ONE AND PHASE TWO = 332

SUBTOTAL SINGLE FAMILY
RESIDENTIAL LOTS
PHASE ONE, TWO AND FUTURE = 953

MULTI-FAMILY
CLUSTER RESIDENTIAL = 162 UNITS
ATTACHED RESIDENTIAL = 204 UNITS

SUBTOTAL MULTI-FAMILY = 366 UNITS

TOTAL RESIDENTIAL = 1319 UNITS/LOTS

SPECIFIC PLAN
MAXIMUM DENSITY = 1362 UNITS/LOTS

LOT DIFFERENTIAL = 43

MADUENO, SMITH AND ASSOCIATES, INC.

FIGURE 2

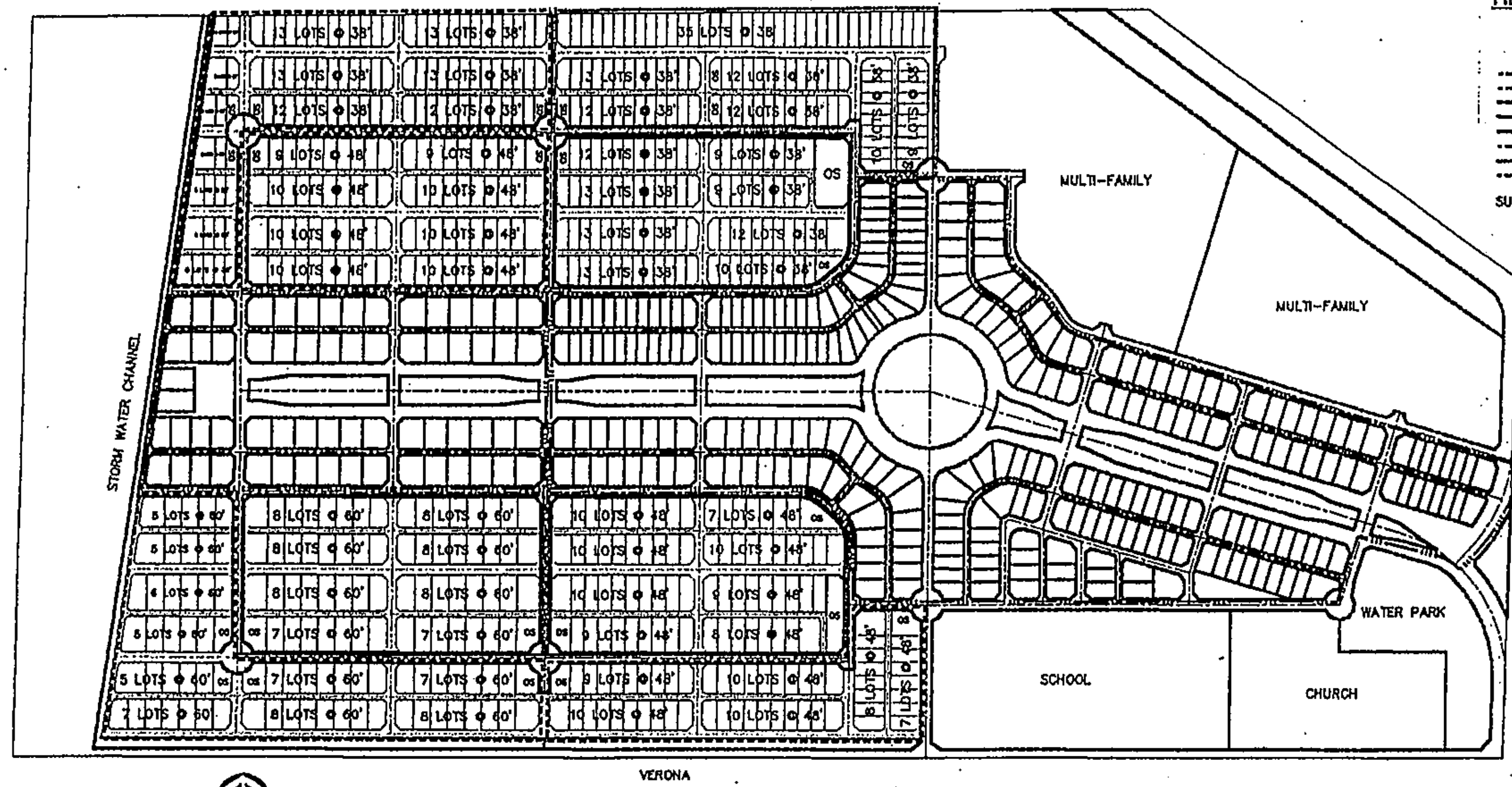
LAND USED PLAN

SCALE: N.T.S.	DATE: 1/19/2000	SHEET 1 OF 1

TENTATIVE TRACT MAP NO. 28639

RIO VISTA VILLAGE

BURNETT DEVELOPMENT CORPORATION



RESIDENTIAL LOT ANALYSIS

LEGEND

Future Residential Lots	Open Space (OS)
54 LOTS @ 48'	.35 ACRES
63 LOTS @ 60'	.51 ACRES
62 LOTS @ 60'	.44 ACRES
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78 LOTS @ 48'	.31 ACRES
103 LOTS @ 38'	.37 ACRES
97 LOTS @ 38'	.35 ACRES
SUBTOTAL 621 LOTS	4.06 ACRES

291 LOTS @ 38'
205 LOTS @ 48'
125 LOTS @ 60'

PHASE ONE RESIDENTIAL LOTS = 268

PHASE TWO RESIDENTIAL LOTS = 64

SUBTOTAL RESIDENTIAL LOTS
PHASE ONE AND PHASE TWO = 332

SUBTOTAL SINGLE FAMILY RESIDENTIAL LOTS
PHASE ONE, TWO AND FUTURE = 953

MULTI-FAMILY
CLUSTER RESIDENTIAL = 162 UNITS
ATTACHED RESIDENTIAL = 204 UNITS

SUBTOTAL MULTI-FAMILY = 366 UNITS

TOTAL RESIDENTIAL = 1319 UNITS/LOTS

SPECIFIC PLAN
MAXIMUM DENSITY = 1362 UNITS/LOTS

LOT DIFFERENTIAL = 43

MADINERO, SMITH AND ASSOCIATES, INC.

FIGURE 3

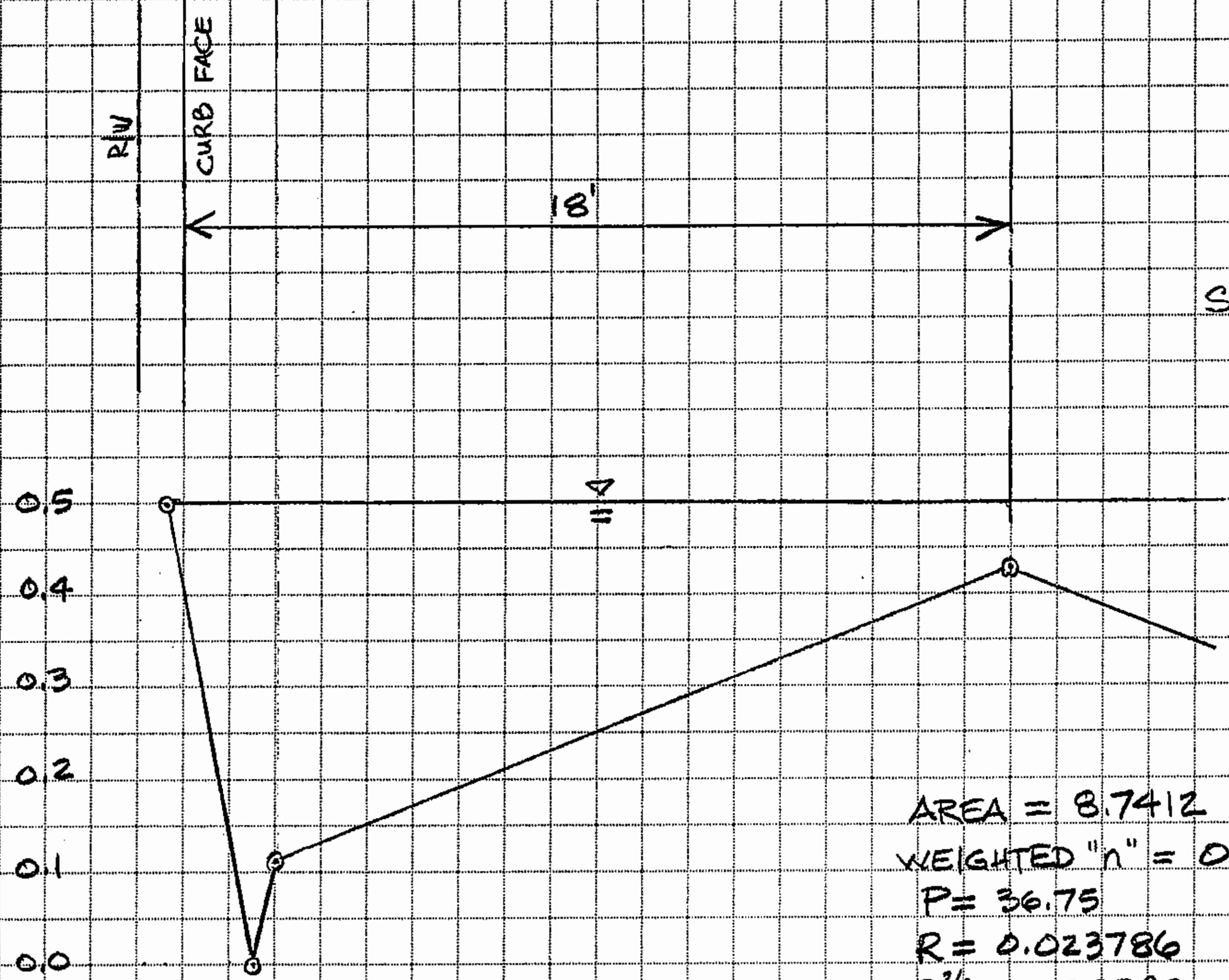
LAND USED PLAN

SCALE: N.T.S.	DATE: 1/19/2000	SHEET 1 OF 1

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB ______
SHEET NO. ______ OF ______
CALCULATED BY ______ DATE ______
CHECKED BY ______ DATE ______
SCALE ______

Scale: HORIZ. 1" = 4'
VERT. 1" = 1'



AREA = 8.7412 S.F.
WEIGHTED "n" = 0.01585
P = 36.75
R = 0.023786
$R^{2/3}$ = 0.38389

Manning's Eq.

$$V = \frac{1.49}{n} R^{2/3} S^{1/2} \Rightarrow \boxed{Q = 315.45\ S^{1/2}}$$

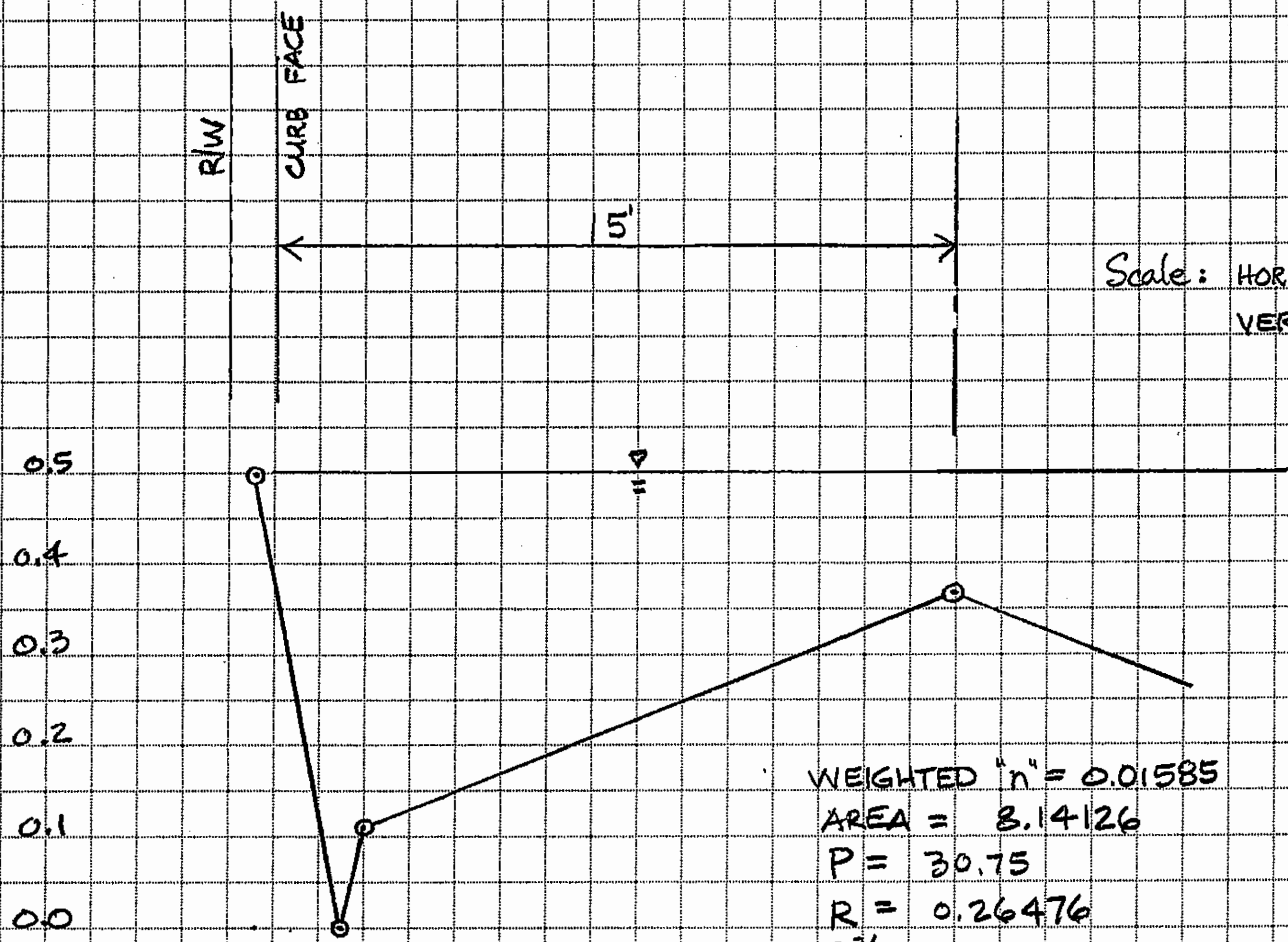
TOP OF CURB CAPACITY OF 36' STREET

FIGURE 4

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB ____
SHEET NO. ____ OF ____
CALCULATED BY ____ DATE ____
CHECKED BY ____ DATE ____
SCALE ____

Scale: HORIZ: 1"=4'
VERT: 1"=1'



WEIGHTED "n" = 0.01585
AREA = 8.14126
P = 30.75
R = 0.26476
$R^{2/3}$ = 0.41232

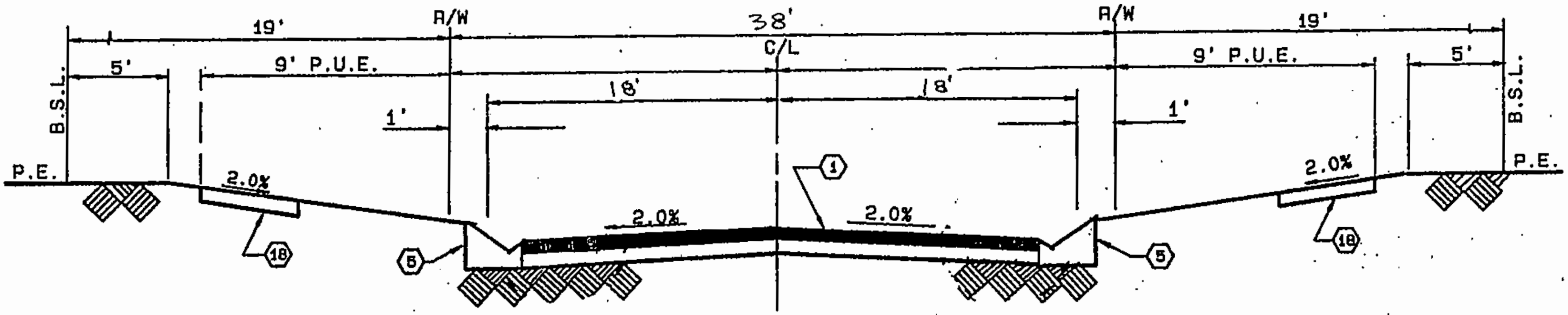
Manning's Eq.

$V = \frac{1.49}{n} R^{2/3} S^{1/2}$ $\Rightarrow$ $\boxed{Q = 315.56\ S^{1/2}}$

$Q = AV$

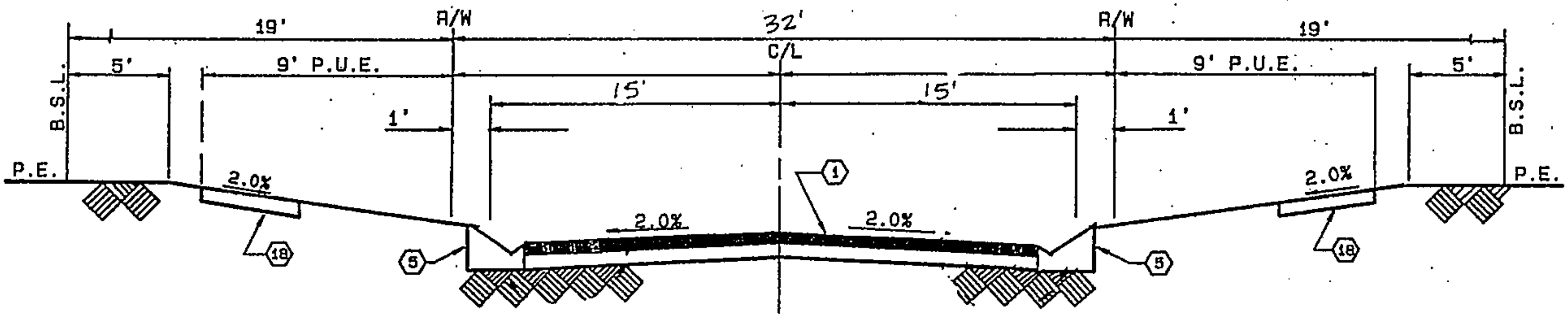
TOP OF CURB CAPACITY OF 30' STREET

FIGURE 5



TYPICAL STREET SECTION
NOT TO SCALE

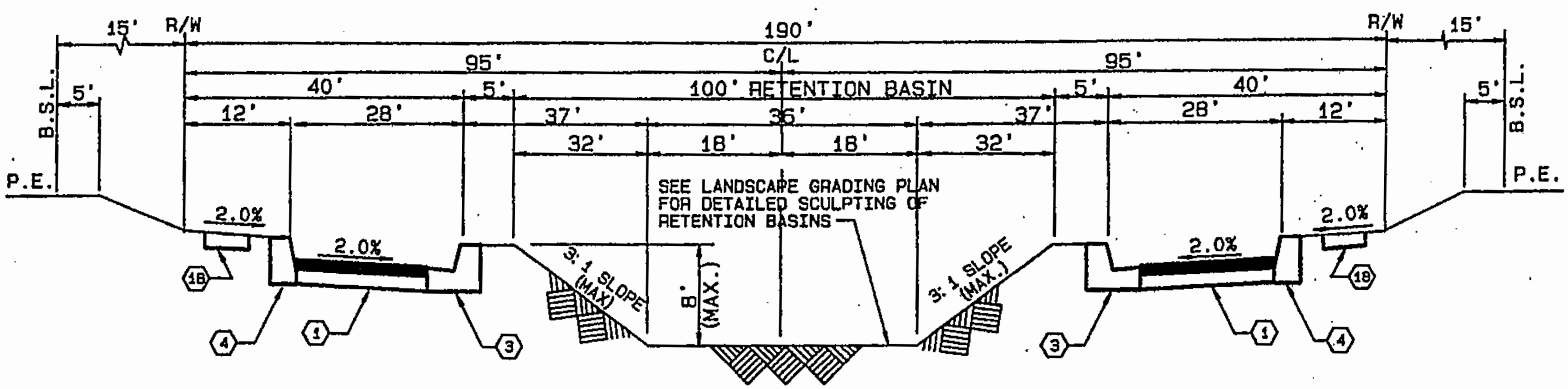
Figure 6



TYPICAL STREET SECTION
NOT TO SCALE

RIO FELECIA ROAD

Figure 7

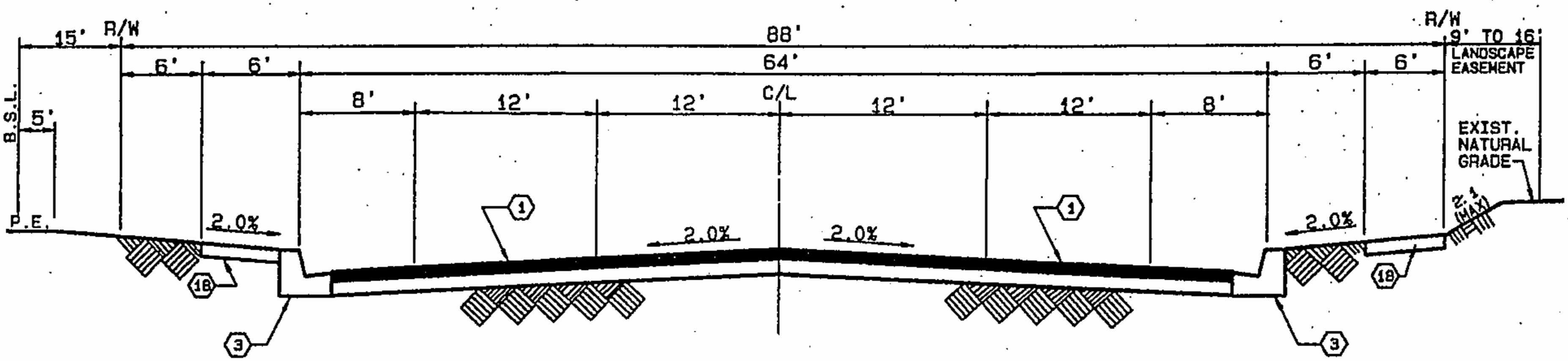


TYPICAL STREET SECTION C–C

NOT TO SCALE

RIO VISTA DRIVE - NORTH & SOUTH

Figure 8

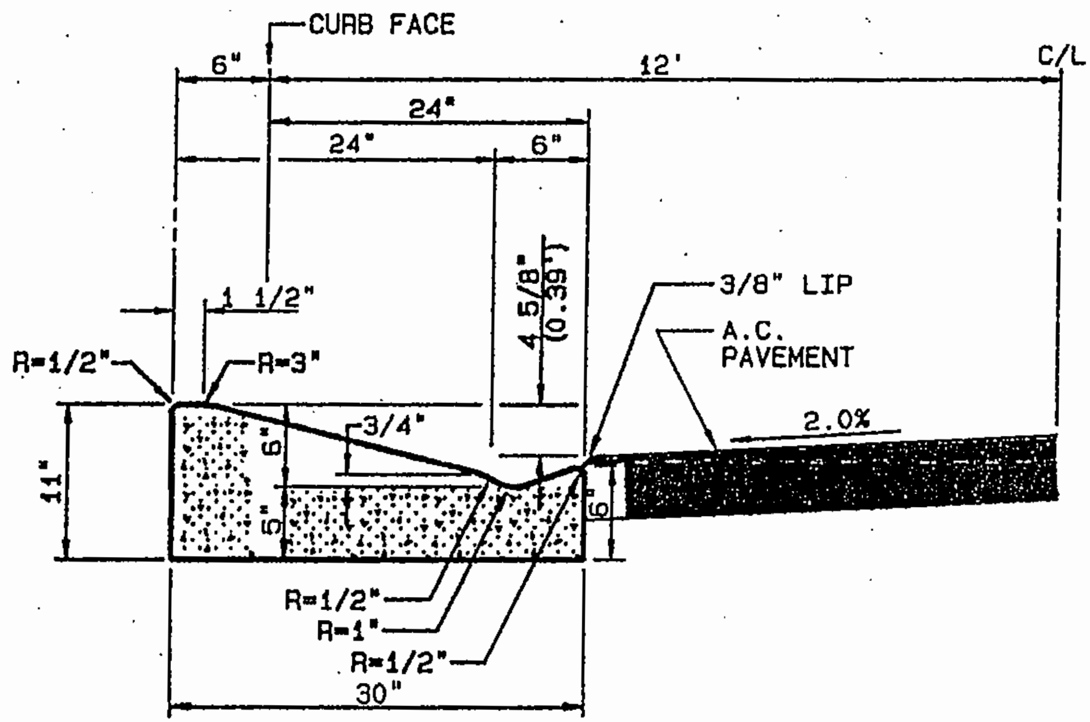


LANDAU BLVD.

TYPICAL STREET SECTION B-B

NOT TO SCALE

Figure 9



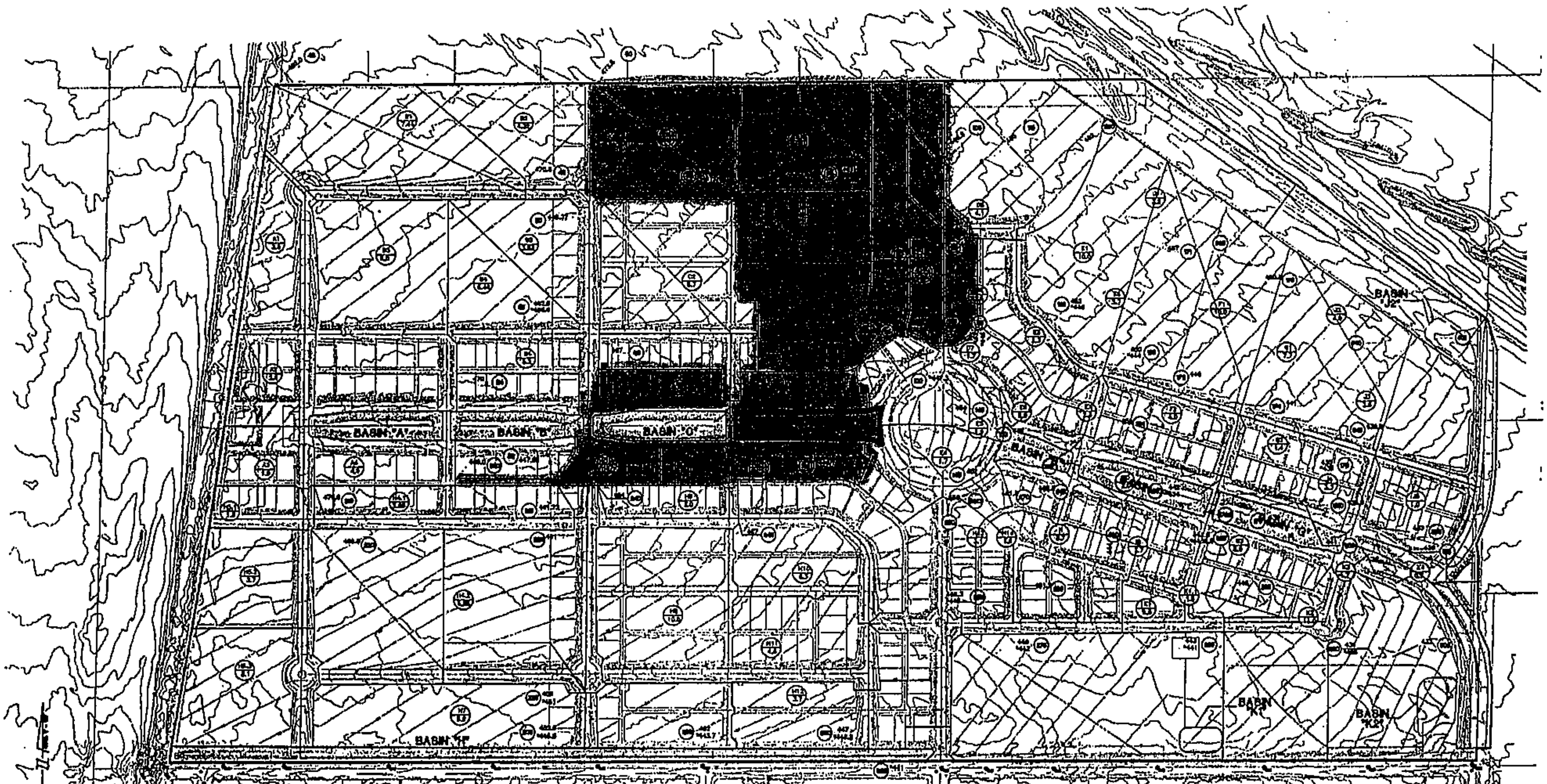
WEDGE CURB DETAIL–6" C.F. (5)

NOT TO SCALE

NOTES:

1. ALL CONCRETE SHALL BE 560–C–2800.
2. CURB FACE SHALL BE AS SPECIFIED ON PLANS.
3. WEAKENED PLANE JOINT EVERY 10' O.C.
4. EXPANSION PAPER REQUIRED EVERY 50' AT THE TOPS OF DRIVEWAY X'S AND AT ECR'S AND BCR'S.

Figure 10



Drainage Area " D "

FIGURE 13

Unit Hydrograph Summary Chart

	Basin	L	Lc	H	"n"	Area Total	Ret.	1/2 ac.	1/4 ac.	Condo	Apt.	Comm.	Fp	Fp min.	Low Loss	Rain	Lag Time	Vol.
	B	2095	950	16.15	0.015	22.26	1.22			21.04			0.325	0.16	90	4.5	15	1.93
	C	1055	565	13.4	0.015	10	1.28			8.46			0.35	0.175	90	4.5	15	0.79
	D	2260	760	26.4	0.015	35.26	1.47		4.5	29.29			0.33	0.017	90	4.5	15	2.98
	E	1770	750	16.4	0.015	25.45	0.66	8.21	2.22		14.36		0.328	0.164	90	4.5	15	2.18
	F	1372	680	13.09	0.015	12.6	1.2		1.96		9.44		0.29	0.145	90	4.5	15	1.26
	G	1400	420	15.78	0.015	21.85	1.21		12.71		7.17	0.76	0.39	0.195	90	4.5	15	1.49
	H1	2100	880	17.11	0.015	10			8.69				0.41	0.205	90	4.5	15	0.63
	H2	1930	500	17.2	0.015	23				23			0.41	0.205	90	4.5	15	1.44
	H4	2000	500	14.96	0.015	24.49			24.49				0.41	0.205	90	4.5	15	1.54
	I	1078	358	8.73	0.015	10	0.223			8.2			0.316	0.158	90	4.5	15	0.89
	K2	1784	704	12.1	0.015	22.45		11.1	3.41		3.84	4.1	0.37	0.185	90	4.5	15	1.66

L = Length of watercourse
Lc = Length from Concentration Point to point opposite centroid of area
H = Elevation difference along watercourse
"n" = Manning's friction factor along watercourse
Area Total = Total tributary area (10 acres minimum)
Ret. = Retention area
1/2 ac. = Land use with approximately 40% impervious area
1/4 ac. = Land use with approximately 50% impervious area
Condo = Land use with approximately 65% impervious area
Apt. = Land use with approximately 80% impervious area
Comm. = Land use with approximately 90% impervious area
Fp = Uniform mean soil loss
Fp min. = Minimun soil loss rate
Low Loss = Low soil loss rate
Rain = Rainfall
Lag Time = Unit hydrograph time unit
Vol. = Runoff Volume for drainage area

Figure 22

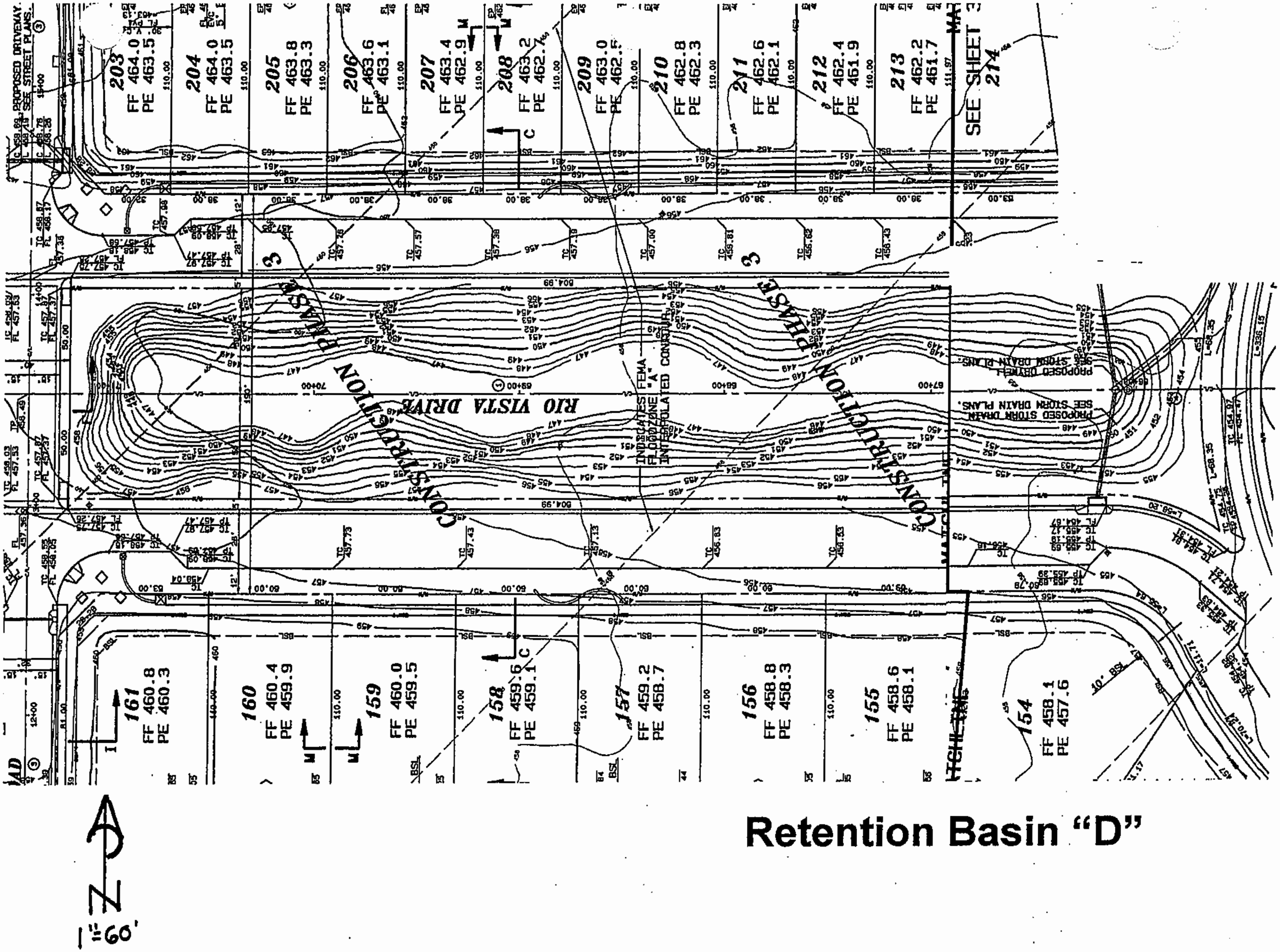
RETENTION BASIN "D" CAPACITY CHART

ELEVATION	AREA (AC)	INCREMENTAL VOLUME (A-F)	ACCUMULATED VOLUME (A-F)
447.0	0.2967	0.000	0
448.0	0.3680	0.3324	0.3324
449.0	0.4433	0.4057	0.738 *
450.0	0.5258	0.4845	1.2226
451.0	0.6134	0.5896	1.7922
452.0	0.7037	0.6585	2.45075
453.0	0.7991	0.7514	3.202 **
454.0	0.8940	0.8465	4.049
455.0	0.9943	0.94415	4.993

* 100 Year, 1 Hour Retention Volume
(See Shortcut Method for 100-year, 1-hour HGL) 0.733 A-F = WS 449.00

** 100 Year, 24 Hour Retention Volume
(See Synthetic Unit Hydrograph Calculations) 2.98 A-F = WS 452.71

FIGURE 27



Retention Basin "D"

FIGURE 28

Rational Method Calculations
100-Year Storm

```
*****************************************************************************
     RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
   RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
            (RCFC&WCD) 1978 HYDROLOGY MANUAL
     (c) Copyright 1982-94 Advanced Engineering Software (aes)
       Ver. 1.5A  Release Date: 6/01/94  License ID 1304

                 Analysis prepared by:

            MAINIERO, SMITH & ASSOCIATES, INC.
  CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING
            777 TAHQUIST CANYON WAY, SUITE 301
            PALM SPRINGS, CALIFORNIA 92262-7066

************************** DESCRIPTION OF STUDY **************************
* Rio Vista Village - Tract 28639-1                                      *
* 100 Year Storm                                                         *
* Rational Method Calculations                                           *
**************************************************************************

  FILE NAME: 1064P.DAT
  TIME/DATE OF STUDY:  9:46  3/20/2001
------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = .85
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  .980
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  .5799047
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  .5796024
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) = 1.6000
  SLOPE OF INTENSITY DURATION CURVE = .5796
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
     AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
```

Begin Drainage Area "B"

```
*****************************************************************************
  FLOW PROCESS FROM NODE    40.00 TO NODE    45.00 IS CODE =  21
------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH =  1050.00
  UPSTREAM ELEVATION =    482.00
  DOWNSTREAM ELEVATION =    470.50
  ELEVATION DIFFERENCE =     11.50
  TC = .359*[( 1050.00**3)/(   11.50)]**.2 =   14.319
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.671
  SOIL CLASSIFICATION IS "A"
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7628
  SUBAREA RUNOFF(CFS) =     21.67
  TOTAL AREA(ACRES) =      7.74   TOTAL RUNOFF(CFS) =     21.67

*****************************************************************************
  FLOW PROCESS FROM NODE    45.00 TO NODE    50.00 IS CODE =  6
------------------------------------------------------------
  >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
```

```
================================================================================
UPSTREAM ELEVATION =   470.50  DOWNSTREAM ELEVATION =   468.37
STREET LENGTH(FEET) =  300.00  CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) =  .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

   **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  27.34
***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS:
   NOTE: STREETFLOW EXCEEDS TOP OF CURB.
   THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
   THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
   THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
   STREET FLOWDEPTH(FEET) =  .55
   HALFSTREET FLOODWIDTH(FEET) =  18.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.20
   PRODUCT OF DEPTH&VELOCITY =   1.77
STREETFLOW TRAVELTIME(MIN) =  1.56  TC(MIN) =  15.88

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.457
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7581
SUBAREA AREA(ACRES) =   4.32  SUBAREA RUNOFF(CFS) =  11.32
SUMMED AREA(ACRES) =  12.06  TOTAL RUNOFF(CFS) =   33.00
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .59  HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 3.32  DEPTH*VELOCITY =  1.96


****************************************************************************
FLOW PROCESS FROM NODE   50.00 TO NODE   51.00 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
================================================================================
UPSTREAM ELEVATION =   468.37  DOWNSTREAM ELEVATION =   465.72
STREET LENGTH(FEET) =  438.00  CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) =  .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

   **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  37.24
***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS:
   NOTE: STREETFLOW EXCEEDS TOP OF CURB.
   THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
   THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
   THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
   STREET FLOWDEPTH(FEET) =  .61
   HALFSTREET FLOODWIDTH(FEET) =  18.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.50
   PRODUCT OF DEPTH&VELOCITY =   2.14
STREETFLOW TRAVELTIME(MIN) =  2.09  TC(MIN) =  17.97

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.218
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7525
SUBAREA AREA(ACRES) =   3.52  SUBAREA RUNOFF(CFS) =   8.53
SUMMED AREA(ACRES) =  15.58  TOTAL RUNOFF(CFS) =   41.52
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .63  HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 3.66  DEPTH*VELOCITY =  2.31
```

41.52 CFS ENTERS TWO
CATCH BASINS AT 23+53.50
RIO GUADALUPE. DEPTH = 0.63'
LINE B-1, MH 2 & MH 3

```
****************************************************************************
 FLOW PROCESS FROM NODE    51.00 TO NODE    55.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.9 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  13.2
 UPSTREAM NODE ELEVATION =   458.47
 DOWNSTREAM NODE ELEVATION =   450.36
 FLOWLENGTH(FEET) =   306.49   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     41.52
 TRAVEL TIME(MIN.) =    .39    TC(MIN.) =  18.35

****************************************************************************
 FLOW PROCESS FROM NODE    55.00 TO NODE    55.00 IS CODE =  8
 ----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.179
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7516
 SUBAREA AREA(ACRES) =     5.46   SUBAREA RUNOFF(CFS) =   13.04
 TOTAL AREA(ACRES) =     21.04   TOTAL RUNOFF(CFS) =    54.57
 TC(MIN) =  18.35
```

13.04 CFS ENTERS TWO CATCH BASINS AT 20+54 RIO GUADALUPE.
DEPTH = 0.41'
LINE B-2, MH 4
LINE B-3, MH 5

```
****************************************************************************
 FLOW PROCESS FROM NODE    55.00 TO NODE    56.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.2 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  12.9
 UPSTREAM NODE ELEVATION =   449.77
 DOWNSTREAM NODE ELEVATION =   447.35
 FLOWLENGTH(FEET) =   121.35   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     54.57
 TRAVEL TIME(MIN.) =    .16    TC(MIN.) =  18.51
```

End Drainage Area “B”

Begin Drainage Area “C”

```
****************************************************************************
 FLOW PROCESS FROM NODE    67.00 TO NODE    68.00 IS CODE = 21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   700.00
 UPSTREAM ELEVATION =    470.40
 DOWNSTREAM ELEVATION =    461.61
 ELEVATION DIFFERENCE =      8.79
 TC = .359*[(  700.00**3)/(    8.79)]**.2 =   11.847
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.097
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7712
 SUBAREA RUNOFF(CFS) =     20.03
 TOTAL AREA(ACRES) =      6.34   TOTAL RUNOFF(CFS) =     20.03
```

```
******************************************************************************
 FLOW PROCESS FROM NODE    68.00 TO NODE    69.00 IS CODE =  6
------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 UPSTREAM ELEVATION =   461.61  DOWNSTREAM ELEVATION =   458.34
 STREET LENGTH(FEET) =  242.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 15.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  13.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   23.20
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =  .49
     HALFSTREET FLOODWIDTH(FEET) =   15.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.70
     PRODUCT OF DEPTH&VELOCITY =    1.82
 STREETFLOW TRAVELTIME(MIN) =    1.09   TC(MIN) =  12.94

  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.894
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7673
 SUBAREA AREA(ACRES) =    2.12   SUBAREA RUNOFF(CFS) =    6.33
 SUMMED AREA(ACRES) =    8.46   TOTAL RUNOFF(CFS) =     26.37
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .49   HALFSTREET FLOODWIDTH(FEET) = 15.00
 FLOW VELOCITY(FEET/SEC.) =  4.21   DEPTH*VELOCITY =    2.07
```

26.37 CFS ENTERS TWO CATCH BASINS AT 14+69 RIO FELICIA.
DEPTH = 0.49'.
LINE C, MH 1 & MH 2

```
******************************************************************************
 FLOW PROCESS FROM NODE    69.00 TO NODE    70.00 IS CODE =  4
------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==============================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.0 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  12.8
 UPSTREAM NODE ELEVATION =   451.33
 DOWNSTREAM NODE ELEVATION =   447.75
 FLOWLENGTH(FEET) =    114.63   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     26.37
 TRAVEL TIME(MIN.) =     .15    TC(MIN.) =  13.09
```

End Drainage Area "C"

Begin Drainage Area "D"

```
******************************************************************************
 FLOW PROCESS FROM NODE    60.00 TO NODE    65.00 IS CODE =  21
------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   680.00
 UPSTREAM ELEVATION =   473.40
 DOWNSTREAM ELEVATION =    465.95
 ELEVATION DIFFERENCE =      7.45
 TC =  .359*[(  680.00**3)/(    7.45)]**.2 =   12.034
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.060
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7705
 SUBAREA RUNOFF(CFS) =    18.08
 TOTAL AREA(ACRES) =     5.78  TOTAL RUNOFF(CFS) =    18.08

****************************************************************************
 FLOW PROCESS FROM NODE    65.00 TO NODE    85.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =   465.95  DOWNSTREAM ELEVATION =   462.19
 STREET LENGTH(FEET) =   537.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   24.56
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .53
    HALFSTREET FLOODWIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.14
    PRODUCT OF DEPTH&VELOCITY =    1.67
 STREETFLOW TRAVELTIME(MIN) =   2.85   TC(MIN) =  14.89

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.589
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7610
 SUBAREA AREA(ACRES) =    4.77   SUBAREA RUNOFF(CFS) =   13.03
 SUMMED AREA(ACRES) =   10.55   TOTAL RUNOFF(CFS) =     31.11
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .57   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  3.37   DEPTH*VELOCITY =    1.93


****************************************************************************
 FLOW PROCESS FROM NODE    85.00 TO NODE    90.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =   462.19  DOWNSTREAM ELEVATION =   461.13
 STREET LENGTH(FEET) =   152.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   35.45
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .59
    HALFSTREET FLOODWIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.57
```

```
    PRODUCT OF DEPTH&VELOCITY =   2.11
STREETFLOW TRAVELTIME(MIN) =    .71   TC(MIN) =  15.60

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.493
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7589
 SUBAREA AREA(ACRES) =    3.27   SUBAREA RUNOFF(CFS) =    8.67
 SUMMED AREA(ACRES) =   13.82   TOTAL RUNOFF(CFS) =    39.78
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .61   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  3.74   DEPTH*VELOCITY =   2.28
```

FLOW SPLITS AT THIS POINT, 19.89 CFS ENTERS THE CATCH BASIN AT 11+50 RIO OSO; 19.89 CFS HEADS EAST ON RIO ROSALIA. DEPTH = 0.61'
LINE D-3, MH 6

```
****************************************************************************
 FLOW PROCESS FROM NODE    90.00 TO NODE    90.10 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  15.60   RAIN INTENSITY(INCH/HOUR) =  3.49
 TOTAL AREA(ACRES) =     6.91   TOTAL RUNOFF(CFS) =     19.89
```

THE FOLLOWING SECTIONS MODEL THE FLOW THAT ENTERS THE CATCH BASIN.

```
****************************************************************************
 FLOW PROCESS FROM NODE    90.10 TO NODE    91.00 IS CODE =   4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.1 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =   8.9
 UPSTREAM NODE ELEVATION =   456.85
 DOWNSTREAM NODE ELEVATION =   451.30
 FLOWLENGTH(FEET) =   383.99   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     19.89
 TRAVEL TIME(MIN.) =    .72    TC(MIN.) =  16.32

****************************************************************************
 FLOW PROCESS FROM NODE    91.00 TO NODE    91.10 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  16.32
 RAINFALL INTENSITY(INCH/HR) =   3.40
 TOTAL STREAM AREA(ACRES) =    6.91
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.89

****************************************************************************
 FLOW PROCESS FROM NODE   120.00 TO NODE   121.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   460.00
 UPSTREAM ELEVATION =    466.00
 DOWNSTREAM ELEVATION =    458.65
 ELEVATION DIFFERENCE =       7.35
 TC = .359*[(  460.00**3)/(     7.35)]**.2 =    9.544
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.644
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7806
 SUBAREA RUNOFF(CFS) =    19.79
 TOTAL AREA(ACRES) =     5.46   TOTAL RUNOFF(CFS) =    19.79
```

19.79 CFS ENTERS THE CATCH BASIN AT 15+25. RIO OSO. DEPTH = 0.7' LINE D-2, MH 5

```
****************************************************************************
 FLOW PROCESS FROM NODE   121.00 TO NODE   122.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  11.6 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  14.5
 UPSTREAM NODE ELEVATION =   453.89
 DOWNSTREAM NODE ELEVATION =   451.88
 FLOWLENGTH(FEET) =    38.00   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =      19.79
 TRAVEL TIME(MIN.) =    .04    TC(MIN.) =    9.59

****************************************************************************
 FLOW PROCESS FROM NODE   122.00 TO NODE    91.10 IS CODE =  1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.59
 RAINFALL INTENSITY(INCH/HR) =   4.63
 TOTAL STREAM AREA(ACRES) =    5.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.79

 ** CONFLUENCE DATA **
 STREAM    RUNOFF      Tc      INTENSITY     AREA
 NUMBER     (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1      19.89    16.32      3.403          6.91
    2      19.79     9.59      4.632          5.46

*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**************************************************************************

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

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF      Tc      INTENSITY
 NUMBER     (CFS)    (MIN.)   (INCH/HOUR)
    1      31.48     9.59      4.632
    2      34.43    16.32      3.403

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      34.43  Tc(MIN.) =   16.32
 TOTAL AREA(ACRES) =      12.37

****************************************************************************
 FLOW PROCESS FROM NODE    91.10 TO NODE    92.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  12.6
 UPSTREAM NODE ELEVATION =   451.28
 DOWNSTREAM NODE ELEVATION =   444.02
 FLOWLENGTH(FEET) =   285.59   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =      34.43
```

```
TRAVEL TIME(MIN.) =   .38    TC(MIN.) =  16.70

****************************************************************************
FLOW PROCESS FROM NODE    92.00 TO NODE    92.10 IS CODE =  1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) = 16.70
RAINFALL INTENSITY(INCH/HR) =  3.36
TOTAL STREAM AREA(ACRES) =  12.37
PEAK FLOW RATE(CFS) AT CONFLUENCE =    34.43
```

[redacted]

```
****************************************************************************
FLOW PROCESS FROM NODE   105.00 TO NODE   105.00 IS CODE =  7
----------------------------------------------------------------------------
>>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) =  15.60   RAIN INTENSITY(INCH/HOUR) =  3.49
TOTAL AREA(ACRES) =     6.91   TOTAL RUNOFF(CFS) =     19.89
```

THE FOLLOW SECTIONS MODEL THE 19.89 CFS THAT FLOW EAST ON RIO ROSALIA.

```
****************************************************************************
FLOW PROCESS FROM NODE   105.00 TO NODE   106.00 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =    461.89  DOWNSTREAM ELEVATION =    457.85
STREET LENGTH(FEET) =   336.00   CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
INTERIOR STREET CROSSFALL(DECIMAL) =   .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   22.99
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .49
    HALFSTREET FLOODWIDTH(FEET) =   17.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.58
    PRODUCT OF DEPTH&VELOCITY =    1.77
STREETFLOW TRAVELTIME(MIN) =   1.56   TC(MIN) =  17.16

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.305
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7546
SUBAREA AREA(ACRES) =    2.48   SUBAREA RUNOFF(CFS) =    6.18
SUMMED AREA(ACRES) =    9.39   TOTAL RUNOFF(CFS) =     26.07
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .51   HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) =  3.66   DEPTH*VELOCITY =   1.88

****************************************************************************
FLOW PROCESS FROM NODE   106.00 TO NODE   106.00 IS CODE =  8
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.305
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7546
SUBAREA AREA(ACRES) =    1.78   SUBAREA RUNOFF(CFS) =    4.44
TOTAL AREA(ACRES) =    11.17   TOTAL RUNOFF(CFS) =   30.51
TC(MIN) =  17.16
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   106.00 TO NODE   107.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 ============================================================================
 UPSTREAM ELEVATION =   457.85  DOWNSTREAM ELEVATION =   453.29
 STREET LENGTH(FEET) =  395.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  33.13
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .55
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.88
    PRODUCT OF DEPTH&VELOCITY =   2.15
 STREETFLOW TRAVELTIME(MIN) =  1.70   TC(MIN) =  18.86

  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.129
  SOIL CLASSIFICATION IS "A"
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7503
  SUBAREA AREA(ACRES) =    2.23   SUBAREA RUNOFF(CFS) =   5.24
  SUMMED AREA(ACRES) =   13.40   TOTAL RUNOFF(CFS) =   35.75
  END OF SUBAREA STREETFLOW HYDRAULICS:
  DEPTH(FEET) =  .55   HALFSTREET FLOODWIDTH(FEET) = 18.00
  FLOW VELOCITY(FEET/SEC.) =  4.19   DEPTH*VELOCITY =   2.31
```

35.75 CFS ENTERS TWO
CATCH BASINS AT 26+07.88
AVE. QUINTANA
DEPTH = 0.55
LINE D-1, MH 2 & MH 3

```
****************************************************************************
 FLOW PROCESS FROM NODE   107.00 TO NODE    92.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
 ============================================================================
 PIPEFLOW VELOCITY(FEET/SEC.) =   6.0
 UPSTREAM NODE ELEVATION =   444.84
 DOWNSTREAM NODE ELEVATION =   444.04
 FLOWLENGTH(FEET) =   201.12   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  33.00   NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     35.75
 TRAVEL TIME(MIN.) =    .56    TC(MIN.) =  19.42


****************************************************************************
 FLOW PROCESS FROM NODE    92.00 TO NODE    92.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 ============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  19.42
 RAINFALL INTENSITY(INCH/HR) =   3.08
 TOTAL STREAM AREA(ACRES) =   13.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    35.75

 ** CONFLUENCE DATA **
 STREAM    RUNOFF     Tc     INTENSITY     AREA
```

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)	(ACRE)
1	34.43	16.70	3.358	12.37
2	35.75	19.42	3.077	13.40

*********************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	65.18	16.70	3.358
2	67.30	19.42	3.077

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 67.30 Tc(MIN.) = 19.42
TOTAL AREA(ACRES) = 25.77

****
FLOW PROCESS FROM NODE 92.10 TO NODE 93.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

PIPEFLOW VELOCITY(FEET/SEC.) = 7.0
UPSTREAM NODE ELEVATION = 443.28
DOWNSTREAM NODE ELEVATION = 442.42
FLOWLENGTH(FEET) = 215.65 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 67.30
TRAVEL TIME(MIN.) = .51 TC(MIN.) = 19.93

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

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 660.00
UPSTREAM ELEVATION = 467.10
DOWNSTREAM ELEVATION = 457.36
ELEVATION DIFFERENCE = 9.74
TC = .359*[(660.00**3)/(9.74)]**.2 = 11.203
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.232
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7737
SUBAREA RUNOFF(CFS) = 6.22
TOTAL AREA(ACRES) = 1.90 TOTAL RUNOFF(CFS) = 6.22

****
FLOW PROCESS FROM NODE 71.00 TO NODE 72.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 457.36 DOWNSTREAM ELEVATION = 454.75
STREET LENGTH(FEET) = 520.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 28.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 14.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020

OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 8.43
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .50
HALFSTREET FLOODWIDTH(FEET) = 18.48
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.39
PRODUCT OF DEPTH&VELOCITY = 1.18
STREETFLOW TRAVELTIME(MIN) = 3.63 TC(MIN) = 14.84

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.596
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7612
SUBAREA AREA(ACRES) = 1.62 SUBAREA RUNOFF(CFS) = 4.43
SUMMED AREA(ACRES) = 3.52 TOTAL RUNOFF(CFS) = 10.66
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .55 HALFSTREET FLOODWIDTH(FEET) = 20.96
FLOW VELOCITY(FEET/SEC.) = 2.36 DEPTH*VELOCITY = 1.29

10.66 CFS ENTERS THE CATCH BASIN AT 66+21.30 (N) RIO VISTA DRIVE. D=0.55', LINE D-5, MH 1

****

FLOW PROCESS FROM NODE 72.00 TO NODE 93.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.1 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 20.2
UPSTREAM NODE ELEVATION = 450.88
DOWNSTREAM NODE ELEVATION = 440.92
FLOWLENGTH(FEET) = 50.19 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 10.66
TRAVEL TIME(MIN.) = .04 TC(MIN.) = 14.88

****

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

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 980.00
UPSTREAM ELEVATION = 467.30
DOWNSTREAM ELEVATION = 459.08
ELEVATION DIFFERENCE = 8.22
TC = .393*[(980.00**3)/(8.22)]**.2 = 16.059
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.435
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6966
SUBAREA RUNOFF(CFS) = 4.00
TOTAL AREA(ACRES) = 1.67 TOTAL RUNOFF(CFS) = 4.00

****

FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 459.08 DOWNSTREAM ELEVATION = 454.75
STREET LENGTH(FEET) = 782.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 28.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 14.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 6.75
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .46
HALFSTREET FLOODWIDTH(FEET) = 16.82
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.29
PRODUCT OF DEPTH&VELOCITY = 1.06
STREETFLOW TRAVELTIME(MIN) = 5.69 TC(MIN) = 21.75

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.881
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6769
SUBAREA AREA(ACRES) = 2.83 SUBAREA RUNOFF(CFS) = 5.52
SUMMED AREA(ACRES) = 4.50 TOTAL RUNOFF(CFS) = 9.52
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .51 HALFSTREET FLOODWIDTH(FEET) = 19.30
FLOW VELOCITY(FEET/SEC.) = 2.47 DEPTH*VELOCITY = 1.27

9.52 CFS ENTERS CATCH BASIN AT 66+21.30 (S) RIO VISTA DRIVE D=0.51, LINE D-4, MH1

****

FLOW PROCESS FROM NODE 75.00 TO NODE 93.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.9 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 18.8
UPSTREAM NODE ELEVATION = 450.97
DOWNSTREAM NODE ELEVATION = 442.07
FLOWLENGTH(FEET) = 50.40 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 9.52
TRAVEL TIME(MIN.) = .04 TC(MIN.) = 21.79

End Drainage Area "D"

Begin Drainage Area "E"

****

FLOW PROCESS FROM NODE 131.00 TO NODE 131.10 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS APARTMENT
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 800.00
UPSTREAM ELEVATION = 464.80
DOWNSTREAM ELEVATION = 456.37
ELEVATION DIFFERENCE = 8.43
TC = .323*[(800.00**3)/(8.43)]**.2 = 11.628
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.142
SOIL CLASSIFICATION IS "A"
APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8269
SUBAREA RUNOFF(CFS) = 23.73
TOTAL AREA(ACRES) = 6.93 TOTAL RUNOFF(CFS) = 23.73

****

FLOW PROCESS FROM NODE 131.10 TO NODE 132.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

UPSTREAM ELEVATION = 456.37 DOWNSTREAM ELEVATION = 450.70
STREET LENGTH(FEET) = 724.00 CURB HEIGHT(INCHES) = 6.

STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 35.87
STREET FLOWING FULL
STREETFLOW MODEL RESULTS:
NOTE: STREETFLOW EXCEEDS TOP OF CURB.
THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
STREET FLOWDEPTH(FEET) = .59
HALFSTREET FLOODWIDTH(FEET) = 18.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.61
PRODUCT OF DEPTH&VELOCITY = 2.13
STREETFLOW TRAVELTIME(MIN) = 3.34 TC(MIN) = 14.97

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.577
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7608
SUBAREA AREA(ACRES) = 8.90 SUBAREA RUNOFF(CFS) = 24.22
SUMMED AREA(ACRES) = 15.83 TOTAL RUNOFF(CFS) = 47.95
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .65 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 3.98 DEPTH*VELOCITY = 2.59

****

FLOW PROCESS FROM NODE 132.00 TO NODE 133.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

===

UPSTREAM ELEVATION = 450.70 DOWNSTREAM ELEVATION = 448.40
STREET LENGTH(FEET) = 246.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 48.86
STREET FLOWING FULL
STREETFLOW MODEL RESULTS:
NOTE: STREETFLOW EXCEEDS TOP OF CURB.
THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
STREET FLOWDEPTH(FEET) = .63
HALFSTREET FLOODWIDTH(FEET) = 18.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.31
PRODUCT OF DEPTH&VELOCITY = 2.72
STREETFLOW TRAVELTIME(MIN) = .95 TC(MIN) = 15.92

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.452
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6971
SUBAREA AREA(ACRES) = .75 SUBAREA RUNOFF(CFS) = 1.80
SUMMED AREA(ACRES) = 16.58 TOTAL RUNOFF(CFS) = 49.76
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .63 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 4.38 DEPTH*VELOCITY = 2.77

49.76 CFS ENTERS TWO
CATCH BASINS AT 14+70.08
RIO COLORADO.
DEPTH = 0.63'
LINE E-1, MH1 & MH2

****

```
 FLOW PROCESS FROM NODE   133.00 TO NODE   134.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==========================================================================
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  17.3 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  17.0
 UPSTREAM NODE ELEVATION =  441.61
 DOWNSTREAM NODE ELEVATION =  436.58
 FLOWLENGTH(FEET) =   115.00   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     49.76
 TRAVEL TIME(MIN.) =    .11    TC(MIN.) =  16.04


****************************************************************************
 FLOW PROCESS FROM NODE   140.00 TO NODE   141.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   355.00
 UPSTREAM ELEVATION =    454.07
 DOWNSTREAM ELEVATION =    451.34
 ELEVATION DIFFERENCE =     2.73
 TC = .393*[(  355.00**3)/(    2.73)]**.2 =   10.886
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.303
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7213
 SUBAREA RUNOFF(CFS) =      5.25
 TOTAL AREA(ACRES) =      1.69   TOTAL RUNOFF(CFS) =       5.25


****************************************************************************
 FLOW PROCESS FROM NODE   141.00 TO NODE   142.00 IS CODE =   6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =    451.34   DOWNSTREAM ELEVATION =    448.64
 STREET LENGTH(FEET) =   289.70   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 14.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =   7.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

      **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    7.85
 ***STREETFLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH(FEET) =     .41   FLOODWIDTH(FEET) =   14.00
   FULL HALF-STREET VELOCITY(FEET/SEC.) =    2.63
   SPLIT DEPTH(FEET) =     .32   SPLIT FLOODWIDTH(FEET) =    9.70
   SPLIT FLOW(CFS) =    2.39   SPLIT VELOCITY(FEET/SEC.) =    2.26
   STREETFLOW MODEL RESULTS:
      STREET FLOWDEPTH(FEET) =   .41
      HALFSTREET FLOODWIDTH(FEET) =   14.00
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.63
      PRODUCT OF DEPTH&VELOCITY =    1.07
  STREETFLOW TRAVELTIME(MIN) =   1.84   TC(MIN) =  12.72

   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.931
  SOIL CLASSIFICATION IS "A"
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7115
  SUBAREA AREA(ACRES) =    1.86   SUBAREA RUNOFF(CFS) =     5.20
  SUMMED AREA(ACRES) =    3.55   TOTAL RUNOFF(CFS) =     10.45
  END OF SUBAREA STREETFLOW HYDRAULICS:
  DEPTH(FEET) =  .41   HALFSTREET FLOODWIDTH(FEET) = 14.00
```

```
FLOW VELOCITY(FEET/SEC.) = 2.63  DEPTH*VELOCITY = 1.07

****************************************************************************
FLOW PROCESS FROM NODE  142.00 TO NODE  143.00 IS CODE =  1
----------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 12.72
RAINFALL INTENSITY(INCH/HR) = 3.93
TOTAL STREAM AREA(ACRES) = 3.55
PEAK FLOW RATE(CFS) AT CONFLUENCE =   10.45

****************************************************************************
FLOW PROCESS FROM NODE  156.00 TO NODE  157.00 IS CODE = 21
----------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH =  450.00
UPSTREAM ELEVATION =  461.30
DOWNSTREAM ELEVATION =  451.86
ELEVATION DIFFERENCE =   9.44
TC = .393*[( 450.00**3)/(   9.44)]**.2 =  9.792
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.575
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7279
SUBAREA RUNOFF(CFS) =    5.96
TOTAL AREA(ACRES) =    1.79  TOTAL RUNOFF(CFS) =    5.96

****************************************************************************
FLOW PROCESS FROM NODE  157.00 TO NODE  142.00 IS CODE =  6
----------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =  451.86  DOWNSTREAM ELEVATION =  448.64
STREET LENGTH(FEET) =  420.30  CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  7.00
INTERIOR STREET CROSSFALL(DECIMAL) =  .020
OUTSIDE STREET CROSSFALL(DECIMAL) =  .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   9.98
***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =  .42
    HALFSTREET FLOODWIDTH(FEET) =  14.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.25
    PRODUCT OF DEPTH&VELOCITY =   .94
STREETFLOW TRAVELTIME(MIN) =  3.11  TC(MIN) =  12.90

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.900
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7106
SUBAREA AREA(ACRES) =   2.87  SUBAREA RUNOFF(CFS) =   7.95
SUMMED AREA(ACRES) =   4.66  TOTAL RUNOFF(CFS) =    13.92
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .44  HALFSTREET FLOODWIDTH(FEET) = 14.00
FLOW VELOCITY(FEET/SEC.) = 2.80  DEPTH*VELOCITY =  1.22
```

****

FLOW PROCESS FROM NODE 142.00 TO NODE 143.00 IS CODE = 1

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

==

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 12.90
RAINFALL INTENSITY(INCH/HR) = 3.90
TOTAL STREAM AREA(ACRES) = 4.66
PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.92

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	10.45	12.72	3.931	3.55
2	13.92	12.90	3.900	4.66

********************************WARNING********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	24.17	12.72	3.931
2	24.28	12.90	3.900

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 24.28 Tc(MIN.) = 12.90
TOTAL AREA(ACRES) = 8.21

24.28 CFS ENTERS THE CATCH
BASIN AT 60+99.79 RIO VISTA DR.
DEPTH = 0.7'
LINE E-2, MH 1

****

FLOW PROCESS FROM NODE 143.00 TO NODE 144.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.0 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 24.2
UPSTREAM NODE ELEVATION = 444.61
DOWNSTREAM NODE ELEVATION = 436.36
FLOWLENGTH(FEET) = 46.10 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 24.28
TRAVEL TIME(MIN.) = .03 TC(MIN.) = 12.93

End Drainage Area "E"

Begin Drainage Area "F"

****

FLOW PROCESS FROM NODE 161.00 TO NODE 162.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS APARTMENT
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 1020.00
UPSTREAM ELEVATION = 457.00

```
DOWNSTREAM ELEVATION =   445.84
ELEVATION DIFFERENCE =   11.16
TC = .323*[( 1020.00**3)/(   11.16)]**.2 =  12.718
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.932
SOIL CLASSIFICATION IS "A"
APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8246
SUBAREA RUNOFF(CFS) =   30.61
TOTAL AREA(ACRES) =    9.44  TOTAL RUNOFF(CFS) =   30.61

****************************************************************************
 FLOW PROCESS FROM NODE  162.00 TO NODE  163.00 IS CODE =  6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =  445.84  DOWNSTREAM ELEVATION =  443.91
 STREET LENGTH(FEET) =  239.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 15.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 13.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL) =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  33.21
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =  .57
     HALFSTREET FLOODWIDTH(FEET) =  15.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.86
     PRODUCT OF DEPTH&VELOCITY =   2.20
 STREETFLOW TRAVELTIME(MIN) =  1.03  TC(MIN) =  13.75

  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.758
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7066
 SUBAREA AREA(ACRES) =   1.96  SUBAREA RUNOFF(CFS) =   5.20
 SUMMED AREA(ACRES) =  11.40  TOTAL RUNOFF(CFS) =   35.81
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .59  HALFSTREET FLOODWIDTH(FEET) = 15.00
 FLOW VELOCITY(FEET/SEC.) =  3.90  DEPTH*VELOCITY =   2.30
```

35.81 CFS ENTER TWO
CATCH BASINS AT 15+79.11
RIO BRAVO.
DEPTH = 0.59'
LINE F, MH 1 & MH 2

```
****************************************************************************
 FLOW PROCESS FROM NODE  163.00 TO NODE  164.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.3 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  15.8
 UPSTREAM NODE ELEVATION =  437.18
 DOWNSTREAM NODE ELEVATION =  432.02
 FLOWLENGTH(FEET) =  113.01  MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00  NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =   35.81
 TRAVEL TIME(MIN.) =   .12  TC(MIN.) =  13.87
```

End Drainage Area “F”

Begin Drainage Area “G”

```
****************************************************************************
 FLOW PROCESS FROM NODE   173.00 TO NODE   174.00 IS CODE =  21
 ----------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   900.00
 UPSTREAM ELEVATION =    451.00
 DOWNSTREAM ELEVATION =    440.98
 ELEVATION DIFFERENCE =     10.02
 TC = .323*[( 900.00**3)/(    10.02)]**.2 =   12.055
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.056
 SOIL CLASSIFICATION IS "A"
 APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8260
 SUBAREA RUNOFF(CFS) =     24.02
 TOTAL AREA(ACRES) =      7.17   TOTAL RUNOFF(CFS) =     24.02

****************************************************************************
 FLOW PROCESS FROM NODE   174.00 TO NODE   175.00 IS CODE =  6
 ----------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =    440.98   DOWNSTREAM ELEVATION =    439.41
 STREET LENGTH(FEET) =   245.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   26.76
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =   .55
     HALFSTREET FLOODWIDTH(FEET) =   18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.13
     PRODUCT OF DEPTH&VELOCITY =    1.73
 STREETFLOW TRAVELTIME(MIN) =    1.30   TC(MIN) =  13.36

  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.822
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7084
 SUBAREA AREA(ACRES) =    2.03   SUBAREA RUNOFF(CFS) =    5.50
 SUMMED AREA(ACRES) =    9.20   TOTAL RUNOFF(CFS) =    29.52
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .57   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  3.19   DEPTH*VELOCITY =    1.83
```

29.52 CFS ENTERS TWO CATCH BASINS AT 14+15.56 RIO ARBOLITOS.
D=0.57'
LINE G-1, MH2 & MH3

```
****************************************************************************
 FLOW PROCESS FROM NODE   175.00 TO NODE   176.00 IS CODE =  4
 ----------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==========================================================================
 PIPEFLOW VELOCITY(FEET/SEC.) =   9.4
 UPSTREAM NODE ELEVATION =    432.10
 DOWNSTREAM NODE ELEVATION =   431.87
 FLOWLENGTH(FEET) =     57.34   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00   NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     29.52
```

```
TRAVEL TIME(MIN.) =    .10    TC(MIN.) =  13.46

****************************************************************************
FLOW PROCESS FROM NODE   176.00 TO NODE   176.10 IS CODE =  1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  13.46
RAINFALL INTENSITY(INCH/HR) =  3.81
TOTAL STREAM AREA(ACRES) =    9.20
PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.52

****************************************************************************
FLOW PROCESS FROM NODE   170.00 TO NODE   170.10 IS CODE = 21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH =  900.00
UPSTREAM ELEVATION =    454.50
DOWNSTREAM ELEVATION =    447.46
ELEVATION DIFFERENCE =      7.04
TC = .393*[( 900.00**3)/(    7.04)]**.2 =  15.739
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.475
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6979
SUBAREA RUNOFF(CFS) =      6.33
TOTAL AREA(ACRES) =      2.61   TOTAL RUNOFF(CFS) =      6.33

****************************************************************************
FLOW PROCESS FROM NODE   170.10 TO NODE   170.20 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =    447.46   DOWNSTREAM ELEVATION =    439.09
STREET LENGTH(FEET) =   504.00   CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 28.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  14.00
INTERIOR STREET CROSSFALL(DECIMAL) =   .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =   .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    8.25
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .41
    HALFSTREET FLOODWIDTH(FEET) =   14.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.79
    PRODUCT OF DEPTH&VELOCITY =     1.57
STREETFLOW TRAVELTIME(MIN) =   2.21   TC(MIN) =  17.95

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.220
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6894
SUBAREA AREA(ACRES) =    1.74   SUBAREA RUNOFF(CFS) =    3.86
SUMMED AREA(ACRES) =    4.35   TOTAL RUNOFF(CFS) =    10.19
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .45   HALFSTREET FLOODWIDTH(FEET) = 15.99
FLOW VELOCITY(FEET/SEC.) = 3.81   DEPTH*VELOCITY =  1.70

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

10.19 CFS ENTERS THE CATCH BASIN AT 47+55.57 (N) RIO VISTA DR.
DEPTH = 0.45
LINE G-1, MH 1

FLOW PROCESS FROM NODE 170.20 TO NODE 176.10 IS CODE = 1

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

===

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 17.95
RAINFALL INTENSITY(INCH/HR) = 3.22
TOTAL STREAM AREA(ACRES) = 4.35
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.19

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	29.52	13.46	3.805	9.20
2	10.19	17.95	3.220	4.35

**********************************WARNING**********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	37.16	13.46	3.805
2	35.17	17.95	3.220

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 37.16 Tc(MIN.) = 13.46
TOTAL AREA(ACRES) = 13.55

****

FLOW PROCESS FROM NODE 176.10 TO NODE 177.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

===

PIPEFLOW VELOCITY(FEET/SEC.) = 7.6
UPSTREAM NODE ELEVATION = 431.25
DOWNSTREAM NODE ELEVATION = 431.05
FLOWLENGTH(FEET) = 50.47 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 37.16
TRAVEL TIME(MIN.) = .11 TC(MIN.) = 13.57

****

FLOW PROCESS FROM NODE 170.80 TO NODE 170.90 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

===

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 673.00
UPSTREAM ELEVATION = 443.88
DOWNSTREAM ELEVATION = 439.59
ELEVATION DIFFERENCE = 4.29
TC = .303*[(673.00**3)/(4.29)]**.2 = 11.269
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.218
SOIL CLASSIFICATION IS "A"
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8638
SUBAREA RUNOFF(CFS) = 2.77

```
TOTAL AREA(ACRES) =      .76  TOTAL RUNOFF(CFS) =   2.77
```

2.77 CFS ENTERS CATCH BASIN
AT 12+01.56 (E) RIO ARBOLITOS
DEPTH = 0.35', LINE G-2, MH 3

```
****************************************************************************
 FLOW PROCESS FROM NODE   170.90 TO NODE   171.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.5 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  3.4
 UPSTREAM NODE ELEVATION =  431.47
 DOWNSTREAM NODE ELEVATION =  431.32
 FLOWLENGTH(FEET) =   37.00   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     2.77
 TRAVEL TIME(MIN.) =    .18    TC(MIN.) =  11.45

****************************************************************************
 FLOW PROCESS FROM NODE   171.00 TO NODE   171.00 IS CODE =  8
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.179
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7182
 SUBAREA AREA(ACRES) =    1.39   SUBAREA RUNOFF(CFS) =   4.17
 TOTAL AREA(ACRES) =    2.15   TOTAL RUNOFF(CFS) =     6.94
 TC(MIN) =  11.45
```

4.17 CFS ENTERS CATCH BASIN
AT 12+00.56 (W) RIO ARBOLITOS
DEPTH = 0.43'
LINE G-2, MH 2

```
****************************************************************************
 FLOW PROCESS FROM NODE   171.00 TO NODE   171.10 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 PIPEFLOW VELOCITY(FEET/SEC.) =  3.9
 UPSTREAM NODE ELEVATION =  431.22
 DOWNSTREAM NODE ELEVATION =  430.99
 FLOWLENGTH(FEET) =    58.60   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =      6.94
 TRAVEL TIME(MIN.) =    .25    TC(MIN.) =  11.70

****************************************************************************
 FLOW PROCESS FROM NODE   171.10 TO NODE   171.20 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.) =  11.70
 RAINFALL INTENSITY(INCH/HR) =   4.13
 TOTAL STREAM AREA(ACRES) =    2.15
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.94

****************************************************************************
 FLOW PROCESS FROM NODE   315.00 TO NODE   172.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  1090.00
 UPSTREAM ELEVATION =    452.98
```

```
DOWNSTREAM ELEVATION =    442.84
ELEVATION DIFFERENCE =    10.14
TC = .393*[( 1090.00**3)/(   10.14)]**.2 =   16.413
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.392
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6952
SUBAREA RUNOFF(CFS) =     7.59
TOTAL AREA(ACRES) =     3.22   TOTAL RUNOFF(CFS) =     7.59

****************************************************************************
 FLOW PROCESS FROM NODE   172.00 TO NODE   171.10 IS CODE =   6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =    442.84   DOWNSTREAM ELEVATION =    439.10
 STREET LENGTH(FEET) =   503.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  14.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    9.40
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .50
    HALFSTREET FLOODWIDTH(FEET) =  18.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.66
    PRODUCT OF DEPTH&VELOCITY =    1.32
 STREETFLOW TRAVELTIME(MIN) =   3.15   TC(MIN) =  19.56

  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.063
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6838
 SUBAREA AREA(ACRES) =    1.72   SUBAREA RUNOFF(CFS) =    3.60
 SUMMED AREA(ACRES) =    4.94   TOTAL RUNOFF(CFS) =    11.20
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .51   HALFSTREET FLOODWIDTH(FEET) = 19.30
 FLOW VELOCITY(FEET/SEC.) =  2.91   DEPTH*VELOCITY =    1.49
```

11.20 CFS ENTERS THE CATCH BASIN AT 47+55.01 (S) RIO VISTA DR.
DEPTH = 0.51'
LINE G-2, MH 1

```
****************************************************************************
 FLOW PROCESS FROM NODE   171.10 TO NODE   171.20 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  19.56
 RAINFALL INTENSITY(INCH/HR) =   3.06
 TOTAL STREAM AREA(ACRES) =    4.94
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      11.20

 ** CONFLUENCE DATA **
 STREAM    RUNOFF     Tc     INTENSITY     AREA
 NUMBER    (CFS)   (MIN.)  (INCH/HOUR)   (ACRE)
    1       6.94   11.70     4.127         2.15
    2      11.20   19.56     3.063         4.94

 *********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	13.64	11.70	4.127
2	16.35	19.56	3.063

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 16.35 Tc(MIN.) = 19.56
TOTAL AREA(ACRES) = 7.09

****

FLOW PROCESS FROM NODE 171.20 TO NODE 171.30 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

PIPEFLOW VELOCITY(FEET/SEC.) = 9.3
UPSTREAM NODE ELEVATION = 430.87
DOWNSTREAM NODE ELEVATION = 430.64
FLOWLENGTH(FEET) = 58.74 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 16.35
TRAVEL TIME(MIN.) = .11 TC(MIN.) = 19.67

End Drainage Area "G"

Begin Drainage Area "H1"

****

FLOW PROCESS FROM NODE 240.00 TO NODE 245.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 640.00
UPSTREAM ELEVATION = 464.00
DOWNSTREAM ELEVATION = 457.61
ELEVATION DIFFERENCE = 6.39
TC = .393*[(640.00**3)/(6.39)]**.2 = 13.078
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.869
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7098
SUBAREA RUNOFF(CFS) = 5.35
TOTAL AREA(ACRES) = 1.95 TOTAL RUNOFF(CFS) = 5.35

****

FLOW PROCESS FROM NODE 245.00 TO NODE 250.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 457.61 DOWNSTREAM ELEVATION = 451.60
STREET LENGTH(FEET) = 814.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 12.15
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .45
HALFSTREET FLOODWIDTH(FEET) = 15.50

Rational Method Calculations
10-Year Storm

```
*************************************************************************
      RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
    RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
              (RCFC&WCD) 1978 HYDROLOGY MANUAL
     (c) Copyright 1982-94 Advanced Engineering Software (aes)
       Ver. 1.5A  Release Date: 6/01/94  License ID 1304

                Analysis prepared by:

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************************** DESCRIPTION OF STUDY *************************
* Rio Vista Village - Tract 28639-1                         *
* 10 Year Storm                                           *
* Rational Method Calculations                              *
*************************************************************************

  FILE NAME: 1064P.DAT
  TIME/DATE OF STUDY: 20:44   3/25/2001
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =  .85
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  .980
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  .5799047
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  .5796024
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  10.00   1-HOUR INTENSITY(INCH/HOUR) = .9898
  SLOPE OF INTENSITY DURATION CURVE = .5799
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
     AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
```

Begin Drainage Area "B"

```
*************************************************************************
  FLOW PROCESS FROM NODE    40.00 TO NODE    45.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=========================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH =  1050.00
  UPSTREAM ELEVATION =   482.00
  DOWNSTREAM ELEVATION =   470.50
  ELEVATION DIFFERENCE =    11.50
  TC = .359*[( 1050.00**3)/(   11.50)]**.2 =  14.319
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.272
  SOIL CLASSIFICATION IS "A"
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7252
  SUBAREA RUNOFF(CFS) =    12.75
  TOTAL AREA(ACRES) =     7.74   TOTAL RUNOFF(CFS) =     12.75

*************************************************************************
  FLOW PROCESS FROM NODE    45.00 TO NODE    50.00 IS CODE =   6
-------------------------------------------------------------------------
  >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
```

```
===========================================================================
 UPSTREAM ELEVATION =    470.50   DOWNSTREAM ELEVATION =    468.37
 STREET LENGTH(FEET) =   300.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   16.03
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =  .49
    HALFSTREET FLOODWIDTH(FEET) =  17.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.50
    PRODUCT OF DEPTH&VELOCITY =   1.23
 STREETFLOW TRAVELTIME(MIN) =  2.00   TC(MIN) =  16.32

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.106
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7193
 SUBAREA AREA(ACRES) =    4.32   SUBAREA RUNOFF(CFS) =    6.54
 SUMMED AREA(ACRES) =   12.06   TOTAL RUNOFF(CFS) =     19.30
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .51   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) = 2.71   DEPTH*VELOCITY =   1.39

****************************************************************************
 FLOW PROCESS FROM NODE    50.00 TO NODE    51.00 IS CODE =  6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
===========================================================================
 UPSTREAM ELEVATION =    468.37   DOWNSTREAM ELEVATION =    465.72
 STREET LENGTH(FEET) =   438.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   21.72
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .53
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.77
    PRODUCT OF DEPTH&VELOCITY =   1.48
 STREETFLOW TRAVELTIME(MIN) =  2.63   TC(MIN) =  18.95

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.931
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7127
 SUBAREA AREA(ACRES) =    3.52   SUBAREA RUNOFF(CFS) =    4.84
 SUMMED AREA(ACRES) =   15.58   TOTAL RUNOFF(CFS) =     24.14
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .55   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) = 2.83   DEPTH*VELOCITY =   1.56
```

SEE FIGURE 4
S=0.00605
⟹ STREET CAPACITY = 25.54 CFS
OK

```
****************************************************************************
 FLOW PROCESS FROM NODE    51.00 TO NODE    55.00 IS CODE =  4
----------------------------------------------------------------------------
```

```
>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==============================================================================
DEPTH OF FLOW IN 27.0 INCH PIPE IS 13.8 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 11.8
UPSTREAM NODE ELEVATION = 458.47
DOWNSTREAM NODE ELEVATION = 450.36
FLOWLENGTH(FEET) = 306.49 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 24.14
TRAVEL TIME(MIN.) = .43 TC(MIN.) = 19.39

****************************************************************************
FLOW PROCESS FROM NODE 55.00 TO NODE 55.00 IS CODE = 8
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.906
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7117
SUBAREA AREA(ACRES) = 5.46 SUBAREA RUNOFF(CFS) = 7.41
TOTAL AREA(ACRES) = 21.04 TOTAL RUNOFF(CFS) = 31.54
TC(MIN) = 19.39

****************************************************************************
FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 4
----------------------------------------------------------------------------
>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==============================================================================
DEPTH OF FLOW IN 33.0 INCH PIPE IS 15.7 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 11.3
UPSTREAM NODE ELEVATION = 449.77
DOWNSTREAM NODE ELEVATION = 447.35
FLOWLENGTH(FEET) = 121.35 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 31.54
TRAVEL TIME(MIN.) = .18 TC(MIN.) = 19.57
```

End Drainage Area "B"

Begin Drainage Area "C"

```
****************************************************************************
FLOW PROCESS FROM NODE 67.00 TO NODE 68.00 IS CODE = 21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 700.00
UPSTREAM ELEVATION = 470.40
DOWNSTREAM ELEVATION = 461.61
ELEVATION DIFFERENCE = 8.79
TC = .359*[( 700.00**3)/( 8.79)]**.2 = 11.847
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.536
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7338
SUBAREA RUNOFF(CFS) = 11.80
TOTAL AREA(ACRES) = 6.34 TOTAL RUNOFF(CFS) = 11.80

****************************************************************************
FLOW PROCESS FROM NODE 68.00 TO NODE 69.00 IS CODE = 6
```

```
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
=======================================================================
 UPSTREAM ELEVATION =   461.61   DOWNSTREAM ELEVATION =    458.34
 STREET LENGTH(FEET) =   242.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 15.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  13.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL) =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   13.65
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =  .42
    HALFSTREET FLOODWIDTH(FEET) =  13.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.33
    PRODUCT OF DEPTH&VELOCITY =   1.40
 STREETFLOW TRAVELTIME(MIN) =   1.21   TC(MIN) =  13.06

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.397
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7294
 SUBAREA AREA(ACRES) =    2.12   SUBAREA RUNOFF(CFS) =    3.71
 SUMMED AREA(ACRES) =    8.46   TOTAL RUNOFF(CFS) =     15.50
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .44   HALFSTREET FLOODWIDTH(FEET) = 14.59
 FLOW VELOCITY(FEET/SEC.) =  3.40   DEPTH*VELOCITY =   1.48

****************************************************************************
 FLOW PROCESS FROM NODE    69.00 TO NODE    70.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
=======================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.9 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  11.2
 UPSTREAM NODE ELEVATION =   451.33
 DOWNSTREAM NODE ELEVATION =   447.75
 FLOWLENGTH(FEET) =   114.63   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =      15.50
 TRAVEL TIME(MIN.) =    .17    TC(MIN.) =  13.23
```

End Drainage Area “C”

Begin Drainage Area “D”

```
****************************************************************************
 FLOW PROCESS FROM NODE    60.00 TO NODE    65.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=======================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   680.00
 UPSTREAM ELEVATION =   473.40
 DOWNSTREAM ELEVATION =    465.95
 ELEVATION DIFFERENCE =       7.45
 TC =  .359*[(  680.00**3)/(     7.45)]**.2 =   12.034
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.513
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7331
 SUBAREA RUNOFF(CFS) =      10.65
```

```
TOTAL AREA(ACRES) =     5.78   TOTAL RUNOFF(CFS) =     10.65

****************************************************************************
 FLOW PROCESS FROM NODE    65.00 TO NODE    85.00 IS CODE =  6
 ----------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =   465.95   DOWNSTREAM ELEVATION =   462.19
 STREET LENGTH(FEET) =  537.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  14.39
   STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =  .47
     HALFSTREET FLOODWIDTH(FEET) =  16.50
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.51
     PRODUCT OF DEPTH&VELOCITY =   1.19
 STREETFLOW TRAVELTIME(MIN) =   3.57   TC(MIN) =  15.61

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.161
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7213
 SUBAREA AREA(ACRES) =    4.77   SUBAREA RUNOFF(CFS) =    7.44
 SUMMED AREA(ACRES) =   10.55   TOTAL RUNOFF(CFS) =     18.08
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .49   HALFSTREET FLOODWIDTH(FEET) = 17.50
 FLOW VELOCITY(FEET/SEC.) =  2.82   DEPTH*VELOCITY =   1.39

****************************************************************************
 FLOW PROCESS FROM NODE    85.00 TO NODE    90.00 IS CODE =  6
 ----------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =   462.19   DOWNSTREAM ELEVATION =   461.13
 STREET LENGTH(FEET) =  152.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  20.55
 ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =  .51
     HALFSTREET FLOODWIDTH(FEET) =  18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.88
     PRODUCT OF DEPTH&VELOCITY =   1.48
 STREETFLOW TRAVELTIME(MIN) =    .88   TC(MIN) =  16.48

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.094
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7189
 SUBAREA AREA(ACRES) =    3.27   SUBAREA RUNOFF(CFS) =    4.92
 SUMMED AREA(ACRES) =   13.82   TOTAL RUNOFF(CFS) =     23.01
 END OF SUBAREA STREETFLOW HYDRAULICS:
```

DEPTH(FEET) = .53 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 2.94 DEPTH*VELOCITY = 1.57

SEE FIGURE 4
S= 0.00697
STREET CAPACITY = 26.34 CFS
ok

****

FLOW PROCESS FROM NODE 90.00 TO NODE 90.10 IS CODE = 7

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

USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 16.48 RAIN INTENSITY(INCH/HOUR) = 2.09
TOTAL AREA(ACRES) = 6.91 TOTAL RUNOFF(CFS) = 11.51

****

FLOW PROCESS FROM NODE 90.10 TO NODE 91.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 24.0 INCH PIPE IS 11.4 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 7.8
UPSTREAM NODE ELEVATION = 456.85
DOWNSTREAM NODE ELEVATION = 451.30
FLOWLENGTH(FEET) = 383.99 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 11.51
TRAVEL TIME(MIN.) = .82 TC(MIN.) = 17.30

****

FLOW PROCESS FROM NODE 91.00 TO NODE 91.10 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 17.30
RAINFALL INTENSITY(INCH/HR) = 2.04
TOTAL STREAM AREA(ACRES) = 6.91
PEAK FLOW RATE(CFS) AT CONFLUENCE = 11.51

****

FLOW PROCESS FROM NODE 120.00 TO NODE 121.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 460.00
UPSTREAM ELEVATION = 466.00
DOWNSTREAM ELEVATION = 458.65
ELEVATION DIFFERENCE = 7.35
TC = .359*[(460.00**3)/(7.35)]**.2 = 9.544
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.874
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7436
SUBAREA RUNOFF(CFS) = 11.67
TOTAL AREA(ACRES) = 5.46 TOTAL RUNOFF(CFS) = 11.67

****

FLOW PROCESS FROM NODE 121.00 TO NODE 122.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 21.0 INCH PIPE IS 8.5 INCHES

PIPEFLOW VELOCITY(FEET/SEC.) = 12.7
UPSTREAM NODE ELEVATION = 453.89
DOWNSTREAM NODE ELEVATION = 451.88
FLOWLENGTH(FEET) = 38.00 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 11.67
TRAVEL TIME(MIN.) = .05 TC(MIN.) = 9.59

****

FLOW PROCESS FROM NODE 122.00 TO NODE 91.10 IS CODE = 1

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

==

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 9.59
RAINFALL INTENSITY(INCH/HR) = 2.87
TOTAL STREAM AREA(ACRES) = 5.46
PEAK FLOW RATE(CFS) AT CONFLUENCE = 11.67

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	11.51	17.30	2.036	6.91
2	11.67	9.59	2.866	5.46

*********************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	18.05	9.59	2.866
2	19.80	17.30	2.036

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 18.05 Tc(MIN.) = 9.59
TOTAL AREA(ACRES) = 12.37

****

FLOW PROCESS FROM NODE 91.10 TO NODE 92.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

DEPTH OF FLOW IN 27.0 INCH PIPE IS 11.8 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 10.8
UPSTREAM NODE ELEVATION = 451.28
DOWNSTREAM NODE ELEVATION = 444.02
FLOWLENGTH(FEET) = 285.59 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 18.05
TRAVEL TIME(MIN.) = .44 TC(MIN.) = 10.04

****

FLOW PROCESS FROM NODE 92.00 TO NODE 92.10 IS CODE = 1

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

==

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 10.04
RAINFALL INTENSITY(INCH/HR) = 2.79
TOTAL STREAM AREA(ACRES) = 12.37
PEAK FLOW RATE(CFS) AT CONFLUENCE = 18.05

****

FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 7

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

==

USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 16.48 RAIN INTENSITY(INCH/HOUR) = 2.09
TOTAL AREA(ACRES) = 6.91 TOTAL RUNOFF(CFS) = 11.51

****

FLOW PROCESS FROM NODE 105.00 TO NODE 106.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 461.89 DOWNSTREAM ELEVATION = 457.85
STREET LENGTH(FEET) = 336.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 13.25
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .43
HALFSTREET FLOODWIDTH(FEET) = 14.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.94
PRODUCT OF DEPTH&VELOCITY = 1.28
STREETFLOW TRAVELTIME(MIN) = 1.90 TC(MIN) = 18.38

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.965
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7140
SUBAREA AREA(ACRES) = 2.48 SUBAREA RUNOFF(CFS) = 3.48
SUMMED AREA(ACRES) = 9.39 TOTAL RUNOFF(CFS) = 14.99
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .43 HALFSTREET FLOODWIDTH(FEET) = 14.50
FLOW VELOCITY(FEET/SEC.) = 3.33 DEPTH*VELOCITY = 1.44

****

FLOW PROCESS FROM NODE 106.00 TO NODE 106.00 IS CODE = 8

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

==

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.965
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7140
SUBAREA AREA(ACRES) = 1.78 SUBAREA RUNOFF(CFS) = 2.50
TOTAL AREA(ACRES) = 11.17 TOTAL RUNOFF(CFS) = 17.49
TC(MIN) = 18.38

****

FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 457.85 DOWNSTREAM ELEVATION = 453.29
STREET LENGTH(FEET) = 395.00 CURB HEIGHT(INCHES) = 6.

STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 18.95
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .47
HALFSTREET FLOODWIDTH(FEET) = 16.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.30
PRODUCT OF DEPTH&VELOCITY = 1.56
STREETFLOW TRAVELTIME(MIN) = 1.99 TC(MIN) = 20.38

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.852
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7095
SUBAREA AREA(ACRES) = 2.23 SUBAREA RUNOFF(CFS) = 2.93
SUMMED AREA(ACRES) = 13.40 TOTAL RUNOFF(CFS) = 20.42
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .49 HALFSTREET FLOODWIDTH(FEET) = 17.50
FLOW VELOCITY(FEET/SEC.) = 3.18 DEPTH*VELOCITY = 1.57

****

FLOW PROCESS FROM NODE 107.00 TO NODE 92.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

DEPTH OF FLOW IN 33.0 INCH PIPE IS 19.7 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 5.5
UPSTREAM NODE ELEVATION = 444.84
DOWNSTREAM NODE ELEVATION = 444.04
FLOWLENGTH(FEET) = 201.12 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 20.42
TRAVEL TIME(MIN.) = .61 TC(MIN.) = 20.98

****

FLOW PROCESS FROM NODE 92.00 TO NODE 92.10 IS CODE = 1

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

==

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 20.98
RAINFALL INTENSITY(INCH/HR) = 1.82
TOTAL STREAM AREA(ACRES) = 13.40
PEAK FLOW RATE(CFS) AT CONFLUENCE = 20.42

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	18.05	10.04	2.792	12.37
2	20.42	20.98	1.820	13.40

**********************************WARNING**********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

```
** PEAK FLOW RATE TABLE **
STREAM    RUNOFF    Tc     INTENSITY
NUMBER    (CFS)   (MIN.)  (INCH/HOUR)
   1      27.82   10.04     2.792
   2      32.19   20.98     1.820

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = .  32.19  Tc(MIN.) =  20.98
TOTAL AREA(ACRES) =    25.77


****************************************************************************
FLOW PROCESS FROM NODE    92.10 TO NODE    93.00 IS CODE =  4
----------------------------------------------------------------------------
>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
DEPTH OF FLOW IN  42.0 INCH PIPE IS  22.2 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) =  6.2
UPSTREAM NODE ELEVATION =  443.28
DOWNSTREAM NODE ELEVATION =  442.42
FLOWLENGTH(FEET) =  215.65   MANNING'S N =  .013
GIVEN PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =  1
PIPEFLOW THRU SUBAREA(CFS) =     32.19
TRAVEL TIME(MIN.) =    .58    TC(MIN.) = 21.56


****************************************************************************
FLOW PROCESS FROM NODE    70.00 TO NODE    71.00 IS CODE = 21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH =  660.00
UPSTREAM ELEVATION =    467.10
DOWNSTREAM ELEVATION =    457.36
ELEVATION DIFFERENCE =      9.74
TC = .359*[( 660.00**3)/(    9.74)]**.2 =  11.203
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.619
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7363
SUBAREA RUNOFF(CFS) =      3.66
TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =      3.66


****************************************************************************
FLOW PROCESS FROM NODE    71.00 TO NODE    72.00 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =    457.36  DOWNSTREAM ELEVATION =    454.75
STREET LENGTH(FEET) =  520.00   CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 28.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  14.00
INTERIOR STREET CROSSFALL(DECIMAL) =   .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =   .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    4.95
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .43
    HALFSTREET FLOODWIDTH(FEET) =   15.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.05
    PRODUCT OF DEPTH&VELOCITY =     .88
 STREETFLOW TRAVELTIME(MIN) =   4.23   TC(MIN) =  15.44
```

```
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.175
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7218
SUBAREA AREA(ACRES) =   1.62   SUBAREA RUNOFF(CFS) =   2.54
SUMMED AREA(ACRES) =   3.52   TOTAL RUNOFF(CFS) =    6.21
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .46   HALFSTREET FLOODWIDTH(FEET) = 16.82
FLOW VELOCITY(FEET/SEC.) = 2.11   DEPTH*VELOCITY =   .97

****************************************************************************
 FLOW PROCESS FROM NODE    72.00 TO NODE    93.00 IS CODE =  4
----------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.6 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) = 17.4
 UPSTREAM NODE ELEVATION =   450.88
 DOWNSTREAM NODE ELEVATION =   440.92
 FLOWLENGTH(FEET) =    50.19   MANNING'S N = .013
 GIVEN PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =     6.21
 TRAVEL TIME(MIN.) =    .05    TC(MIN.) = 15.49

****************************************************************************
 FLOW PROCESS FROM NODE    73.00 TO NODE    74.00 IS CODE = 21
----------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   980.00
 UPSTREAM ELEVATION =    467.30
 DOWNSTREAM ELEVATION =     459.08
 ELEVATION DIFFERENCE =       8.22
 TC = .393*[( 980.00**3)/(    8.22)]**.2 =   16.059
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.126
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6429
 SUBAREA RUNOFF(CFS) =      2.28
 TOTAL AREA(ACRES) =      1.67   TOTAL RUNOFF(CFS) =      2.28

****************************************************************************
 FLOW PROCESS FROM NODE    74.00 TO NODE    75.00 IS CODE =  6
----------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =    459.08   DOWNSTREAM ELEVATION =    454.75
 STREET LENGTH(FEET) =   782.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 14.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    3.81
   STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =   .40
     HALFSTREET FLOODWIDTH(FEET) =   13.51
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.96
     PRODUCT OF DEPTH&VELOCITY =     .78
 STREETFLOW TRAVELTIME(MIN) =    6.65   TC(MIN) =  22.71

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.739
```

```
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6211
SUBAREA AREA(ACRES) =    2.83   SUBAREA RUNOFF(CFS) =    3.06
SUMMED AREA(ACRES) =    4.50   TOTAL RUNOFF(CFS) =     5.34
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .43   HALFSTREET FLOODWIDTH(FEET) = 15.16
FLOW VELOCITY(FEET/SEC.) = 2.21   DEPTH*VELOCITY =   .95

****************************************************************************
 FLOW PROCESS FROM NODE    75.00 TO NODE    93.00 IS CODE =  4
----------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.4 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  15.9
 UPSTREAM NODE ELEVATION =   450.97
 DOWNSTREAM NODE ELEVATION =   442.07
 FLOWLENGTH(FEET) =    50.40   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =      5.34
 TRAVEL TIME(MIN.) =     .05     TC(MIN.) =  22.76
```

End Drainage Area "D"

Begin Drainage Area "E"

```
****************************************************************************
 FLOW PROCESS FROM NODE   131.00 TO NODE   131.10 IS CODE =  21
----------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS APARTMENT
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   800.00
 UPSTREAM ELEVATION =    464.80
 DOWNSTREAM ELEVATION =    456.37
 ELEVATION DIFFERENCE =      8.43
 TC =  .323*[(  800.00**3)/(    8.43)]**.2 =   11.628
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.563
 SOIL CLASSIFICATION IS "A"
 APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8055
 SUBAREA RUNOFF(CFS) =     14.31
 TOTAL AREA(ACRES) =      6.93   TOTAL RUNOFF(CFS) =      14.31


****************************************************************************
 FLOW PROCESS FROM NODE   131.10 TO NODE   132.00 IS CODE =  6
----------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =    456.37   DOWNSTREAM ELEVATION =    450.70
 STREET LENGTH(FEET) =   724.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   21.23
 ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
```

Unit Hydrograph Analyses

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

            U N I T - H Y D R O G R A P H   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL

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

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
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                        Especially prepared for:

                     MAINIERO, SMITH AND ASSOCIATES

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


**********DESCRIPTION OF RESULTS*********************************************
* Rio Vista Village                                                         *
* Area D                                                                    *
* 100 Year, 24 Hour Storm                                                   *
*****************************************************************************

*****************************************************************************
          WATERCOURSE LENGTH =     2260.000 FEET
          LENGTH FROM CONCENTRATION POINT TO CENTROID =     760.000 FEET
          ELEVATION VARIATION ALONG WATERCOURSE =      26.400 FEET
          MANNINGS FRICTION FACTOR ALONG WATERCOURSE =  .015
          WATERSHED AREA =        35.260 ACRES
          UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
          DESERT S-GRAPH SELECTED
          UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =    .330
          LOW SOIL-LOSS RATE PERCENT(DECIMAL) =  .900
          MINIMUM SOIL-LOSS RATE(INCH/HOUR) =    .170
          BASEFLOW =    .000 CFS/SQUARE-MILE
          USER-ENTERED RAINFALL =  4.50 INCHES
          PROGRAM NUMBER  9 SELECTED


          WATERCOURSE "LAG" TIME =      .057 HOURS
          UNIT INTERVAL PERCENTAGE OF LAG-TIME = 438.221
          HYDROGRAPH BASEFLOW =      .000 CFS
          RCFC&WCD AREA ADJUSTMENT FACTOR(PLATE E-5.8) =  .9999



<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

                  Advanced Engineering Software [AES]
                           SERIAL No.I0618I
                  VER. 1.6C     RELEASE DATE: 2/21/86

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

*****************************************************************************
                       UNIT HYDROGRAPH DETERMINATION
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	67.556	96.025
2	98.590	44.112
3	99.982	1.979
4	100.000	.025

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

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	.0090	.0081	.0009
2	.0135	.0121	.0013
3	.0135	.0121	.0013
4	.0180	.0162	.0018
5	.0135	.0121	.0013
6	.0135	.0121	.0013
7	.0135	.0121	.0013
8	.0180	.0162	.0018
9	.0180	.0162	.0018
10	.0180	.0162	.0018
11	.0225	.0202	.0022
12	.0225	.0202	.0022
13	.0225	.0202	.0022
14	.0225	.0202	.0022
15	.0225	.0202	.0022
16	.0270	.0243	.0027
17	.0270	.0243	.0027
18	.0315	.0283	.0031
19	.0315	.0283	.0031
20	.0360	.0324	.0036
21	.0270	.0243	.0027
22	.0315	.0283	.0031
23	.0360	.0324	.0036
24	.0360	.0324	.0036
25	.0405	.0364	.0040
26	.0405	.0364	.0040
27	.0450	.0405	.0045
28	.0450	.0405	.0045
29	.0450	.0405	.0045
30	.0495	.0445	.0049
31	.0540	.0486	.0054
32	.0585	.0526	.0058
33	.0675	.0607	.0067
34	.0675	.0607	.0067
35	.0720	.0648	.0072
36	.0765	.0688	.0076
37	.0855	.0769	.0085
38	.0900	.0810	.0090
39	.0945	.0850	.0094
40	.0990	.0874	.0116
41	.0675	.0607	.0067
42	.0675	.0607	.0067
43	.0900	.0810	.0090
44	.0900	.0810	.0090
45	.0855	.0769	.0085
46	.0855	.0769	.0085
47	.0765	.0688	.0076
48	.0810	.0729	.0081
49	.1125	.0768	.0357
50	.1170	.0757	.0413
51	.1260	.0746	.0514
52	.1305	.0735	.0570
53	.1530	.0724	.0806
54	.1530	.0714	.0816
55	.1035	.0703	.0332
56	.1035	.0693	.0342
57	.1215	.0683	.0532
58	.1170	.0673	.0497
59	.1170	.0663	.0507
60	.1125	.0653	.0472
61	.1080	.0643	.0436
62	.1035	.0634	.0401
63	.0855	.0625	.0230
64	.0855	.0615	.0239
65	.0180	.0162	.0018

66	.0180	.0162	.0018
67	.0135	.0121	.0013
68	.0135	.0121	.0013
69	.0225	.0202	.0022
70	.0225	.0202	.0022
71	.0225	.0202	.0022
72	.0180	.0162	.0018
73	.0180	.0162	.0018
74	.0180	.0162	.0018
75	.0135	.0121	.0013
76	.0090	.0081	.0009
77	.0135	.0121	.0013
78	.0180	.0162	.0018
79	.0135	.0121	.0013
80	.0090	.0081	.0009
81	.0135	.0121	.0013
82	.0135	.0121	.0013
83	.0135	.0121	.0013
84	.0090	.0081	.0009
85	.0135	.0121	.0013
86	.0090	.0081	.0009
87	.0135	.0121	.0013
88	.0090	.0081	.0009
89	.0135	.0121	.0013
90	.0090	.0081	.0009
91	.0090	.0081	.0009
92	.0090	.0081	.0009
93	.0090	.0081	.0009
94	.0090	.0081	.0009
95	.0090	.0081	.0009
96	.0090	.0081	.0009

TOTAL STORM RAINFALL(INCHES) = 4.50
TOTAL SOIL-LOSS(INCHES) = 3.49
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.01

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 10.2445
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.9756

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

         RCFC&WCD 24-HOUR RUNOFF HYDROGRAPH

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

         HYDROGRAPH IN FIFTEEN-MINUTE INTERVALS(CFS)

-----------------------------------------------------------------------------
INTERVAL# VOLUME(AF)   Q(CFS) 0.        5.0       10.0      15.0      20.0
-----------------------------------------------------------------------------
      1        .0018      .09  Q         .         .         .         .
      2        .0053      .17  Q         .         .         .         .
      3        .0092      .19  Q         .         .         .         .
      4        .0141      .24  Q         .         .         .         .
      5        .0185      .21  Q         .         .         .         .
      6        .0224      .19  Q         .         .         .         .
      7        .0264      .19  Q         .         .         .         .
      8        .0313      .24  Q         .         .         .         .
      9        .0365      .25  Q         .         .         .         .
     10        .0418      .26  Q         .         .         .         .
     11        .0480      .30  Q         .         .         .         .
     12        .0546      .32  Q         .         .         .         .
     13        .0612      .32  Q         .         .         .         .
     14        .0678      .32  Q         .         .         .         .
     15        .0744      .32  QV        .         .         .         .
     16        .0819      .36  QV        .         .         .         .
     17        .0898      .38  QV        .         .         .         .
     18        .0986      .43  QV        .         .         .         .
     19        .1079      .45  QV        .         .         .         .
     20        .1180      .49  QV        .         .         .         .
     21        .1268      .42  QV        .         .         .         .
     22        .1356      .43  QV        .         .         .         .
     23        .1458      .49  QV        .         .         .         .
     24        .1563      .51  .QV       .         .         .         .
     25        .1678      .55  .QV       .         .         .         .
     26        .1797      .57  .QV       .         .         .         .
     27        .1924      .62  .QV       .         .         .         .
     28        .2056      .64  .QV       .         .         .         .
     29        .2189      .64  .QV       .         .         .         .
     30        .2330      .68  .Q V      .         .         .         .
     31        .2484      .75  .Q V      .         .         .         .
     32        .2651      .81  .Q V      .         .         .         .
     33        .2840      .92  .Q V      .         .         .         .
     34        .3038      .96  .Q  V     .         .         .         .
     35        .3245     1.00  . Q V     .         .         .         .
     36        .3466     1.07  . Q V     .         .         .         .
     37        .3708     1.17  . Q V     .         .         .         .
     38        .3968     1.26  . Q  V    .         .         .         .
     39        .4241     1.32  . Q  V    .         .         .         .
     40        .4561     1.55  .  Q  V   .         .         .         .
     41        .4804     1.18  . Q   V   .         .         .         .
     42        .5005      .97  .Q    V   .         .         .         .
     43        .5247     1.18  . Q    V  .         .         .         .
     44        .5511     1.27  . Q    V  .         .         .         .
     45        .5766     1.24  . Q    V  .         .         .         .
     46        .6017     1.22  . Q     V .         .         .         .
     47        .6251     1.13  . Q     V .         .         .         .
     48        .6485     1.13  . Q     V .         .         .         .
     49        .7270     3.80  .      Q V.         .         .         .
     50        .8418     5.56  .         .Q        .         .         .
     51        .9829     6.83  .         .   Q     .         .         .
     52       1.1445     7.82  .         .     Q   .         .         .
     53       1.3584    10.35  .         .        V Q        .         .
     54       1.5961    11.51  .         .         .V Q      .         .
     55       1.7396     6.95  .         .   Q     .   V     .         .
     56       1.8410     4.91  .        Q.         .    V    .         .
     57       1.9792     6.69  .         .   Q     .      V  .         .
     58       2.1278     7.19  .         .    Q    .        V.         .
     59       2.2759     7.17  .         .    Q    .         V         .
```

```
    60      2.4178      6.87   .         .  Q      .         . V       .
    61      2.5495      6.37   .         . Q       .         .   V     .
    62      2.6708      5.87   .         .Q        .         .    V    .
    63      2.7548      4.07   .       Q .         .         .      V  .
    64      2.8250      3.40   .     Q   .         .         .      V  .
    65      2.8513      1.28   . Q       .         .         .       V .
    66      2.8575       .30   Q         .         .         .       V .
    67      2.8619       .21   Q         .         .         .       V .
    68      2.8659       .19   Q         .         .         .       V .
    69      2.8717       .28   Q         .         .         .       V .
    70      2.8782       .32   Q         .         .         .       V .
    71      2.8849       .32   Q         .         .         .       V .
    72      2.8906       .28   Q         .         .         .       V .
    73      2.8959       .26   Q         .         .         .       V .
    74      2.9012       .26   Q         .         .         .       V .
    75      2.9056       .21   Q         .         .         .        V.
    76      2.9086       .15   Q         .         .         .        V.
    77      2.9122       .17   Q         .         .         .        V.
    78      2.9170       .23   Q         .         .         .        V.
    79      2.9214       .21   Q         .         .         .        V.
    80      2.9245       .15   Q         .         .         .        V.
    81      2.9281       .17   Q         .         .         .        V.
    82      2.9320       .19   Q         .         .         .        V.
    83      2.9360       .19   Q         .         .         .        V.
    84      2.9390       .15   Q         .         .         .        V.
    85      2.9426       .17   Q         .         .         .        V.
    86      2.9456       .15   Q         .         .         .        V.
    87      2.9492       .17   Q         .         .         .        V.
    88      2.9523       .15   Q         .         .         .        V.
    89      2.9558       .17   Q         .         .         .        V.
    90      2.9589       .15   Q         .         .         .        V.
    91      2.9615       .13   Q         .         .         .        V.
    92      2.9642       .13   Q         .         .         .        V.
    93      2.9668       .13   Q         .         .         .        V.
    94      2.9694       .13   Q         .         .         .        V.
    95      2.9721       .13   Q         .         .         .        V.
    96      2.9747       .13   Q         .         .         .        V.
    97      2.9756       .04   Q         .         .         .        V.
    98      2.9756       .00   Q         .         .         .         V
    99      2.9756       .00   Q         .         .         .         V
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Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade in Retention Basins

Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade Line in Retention Basins

Criteria:

In the Rio Vista project, several storm drains drain into retention basins during storm events. The retention basins are designed to retain 100% of the 100-year, 24-storm runoff. However, the storm drain and catch basin systems are designed to convey the 100-year, 1-hour storm. The following is our approach to establish the appropriate elevation for the hydraulic grade line at the outlet of each storm drain system.

Proposed Hydraulic Approach:

Using the "Shortcut Method" Synthetic Unit Hydrograph from the RCFC & WCD Hydrology Manual, we adjust the percentage rainfall in accordance with the Rainfall Pattern for the 100-year, 1-hour storm graph attached. We adjust the "constant loss rate" until the peak 100-year, 1-hour storm runoff rate equals the Rational Method peak runoff rate. In our sample problem, 15.20 acres produce 46.7 cubic feet per second of peak runoff. The Runoff Pattern graph attached indicates the runoff per 2.5-minute periods from the Shortcut Method calculations. In the "Shortcut Method", we allow a small portion of the runoff to percolate in the bottom of the basin. This percolation value is based on the size of the basin and the allowable percolation rate. Using the "Accumulated Volume" information for unit time period #13, we can estimate the maximum volume in each retention basin at the time of peak 100-year runoff. This volume will provide the Hydraulic Grade Line elevation for each storm drain system.

Results:

Results from the "Shortcut Method" indicate the depth in the retention basin is shallow at the time of peak runoff. This result is anticipated due to the nature of the 1-hour storm (thunderstorm type event).

RCFC & WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD Unit Hydrograph, Effective Rain and Retention Basin Calculation Form	Project 1064 "Sample Problem" Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	15.2	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	2.7	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.35	[16] RETENTION BASIN PERCOLATION-INCHES	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20]/100	[22] LOSS RATE in MAX	LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.113	0.000	0.000	0.018	0.0001	0.0024	-0.0024	0.000
2.000	0.210	0.003	0.113	0.003	0.000	0.124	0.0004	0.0024	-0.0020	0.000
3.000	0.520	0.008	0.113	0.007	0.001	0.306	0.0011	0.0024	-0.0014	0.000
4.000	0.890	0.014	0.113	0.013	0.001	0.524	0.0018	0.0024	-0.0006	0.000
5.000	1.410	0.023	0.113	0.020	0.002	0.830	0.0029	0.0024	0.0004	0.000
6.000	2.110	0.034	0.113	0.030	0.003	1.242	0.0043	0.0024	0.0018	0.002
7.000	3.060	0.049	0.113	0.044	0.005	1.801	0.0062	0.0024	0.0038	0.006
8.000	4.190	0.067	0.113	0.060	0.007	2.466	0.0085	0.0024	0.0061	0.012
9.000	5.600	0.090	0.113	0.081	0.009	3.296	0.0113	0.0024	0.0089	0.021
10.000	7.410	0.119	0.113	0.107	0.012	4.361	0.0150	0.0024	0.0126	0.034
11.000	9.790	0.157	0.113	0.141	0.044	16.236	0.0559	0.0024	0.0535	0.087
12.000	14.980	0.240	0.113	0.216	0.127	46.782	0.1611	0.0024	0.1587	0.246
13.000	14.980	0.240	0.113	0.216	0.127	46.782	0.1611	0.0024	0.1587	0.404
14.000	9.790	0.157	0.113	0.141	0.044	16.236	0.0559	0.0024	0.0535	0.458
15.000	7.410	0.119	0.113	0.107	0.012	4.361	0.0150	0.0024	0.0126	0.470
16.000	5.600	0.090	0.113	0.081	0.009	3.296	0.0113	0.0024	0.0089	0.479
17.000	4.190	0.067	0.113	0.060	0.007	2.466	0.0085	0.0024	0.0061	0.485
18.000	3.060	0.049	0.113	0.044	0.005	1.801	0.0062	0.0024	0.0038	0.489
19.000	2.110	0.034	0.113	0.030	0.003	1.242	0.0043	0.0024	0.0018	0.491
20.000	1.410	0.023	0.113	0.020	0.002	0.830	0.0029	0.0024	0.0004	0.492
21.000	0.890	0.014	0.113	0.013	0.001	0.524	0.0018	0.0024	-0.0006	0.491
22.000	0.520	0.008	0.113	0.007	0.001	0.306	0.0011	0.0024	-0.0014	0.490
23.000	0.210	0.003	0.113	0.003	0.000	0.124	0.0004	0.0024	-0.0020	0.488
24.000	0.030	0.000	0.113	0.000	0.000	0.018	0.0001	0.0024	-0.0024	0.485
TOTALS					0.4240	155.9700				MAX: .492

" SAMPLE PROBLEM "

EFFECTIVE RAIN = 0.018 INCHES/ACRE

MAX RETENTION = 0.492 ACRE-FT

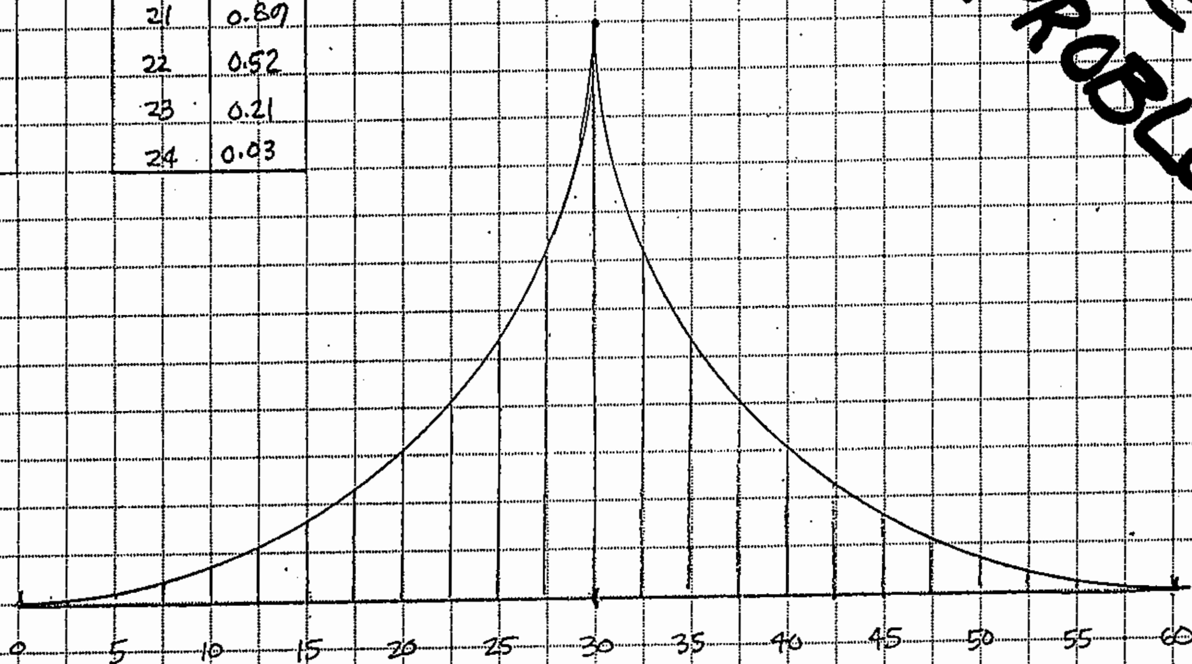
MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB 1064 RIO VISTA
SHEET NO. ______ OF ______
CALCULATED BY ______ DATE 2-12-01
CHECKED BY ______ DATE ______
SCALE ______

"SAMPLE PROBLEM"

PERIOD	% STORM
1	0.03
2	0.21
3	0.52
4	0.89
5	1.41
6	2.11
7	3.06
8	4.19
9	5.60
10	7.41
11	9.79
12	14.78

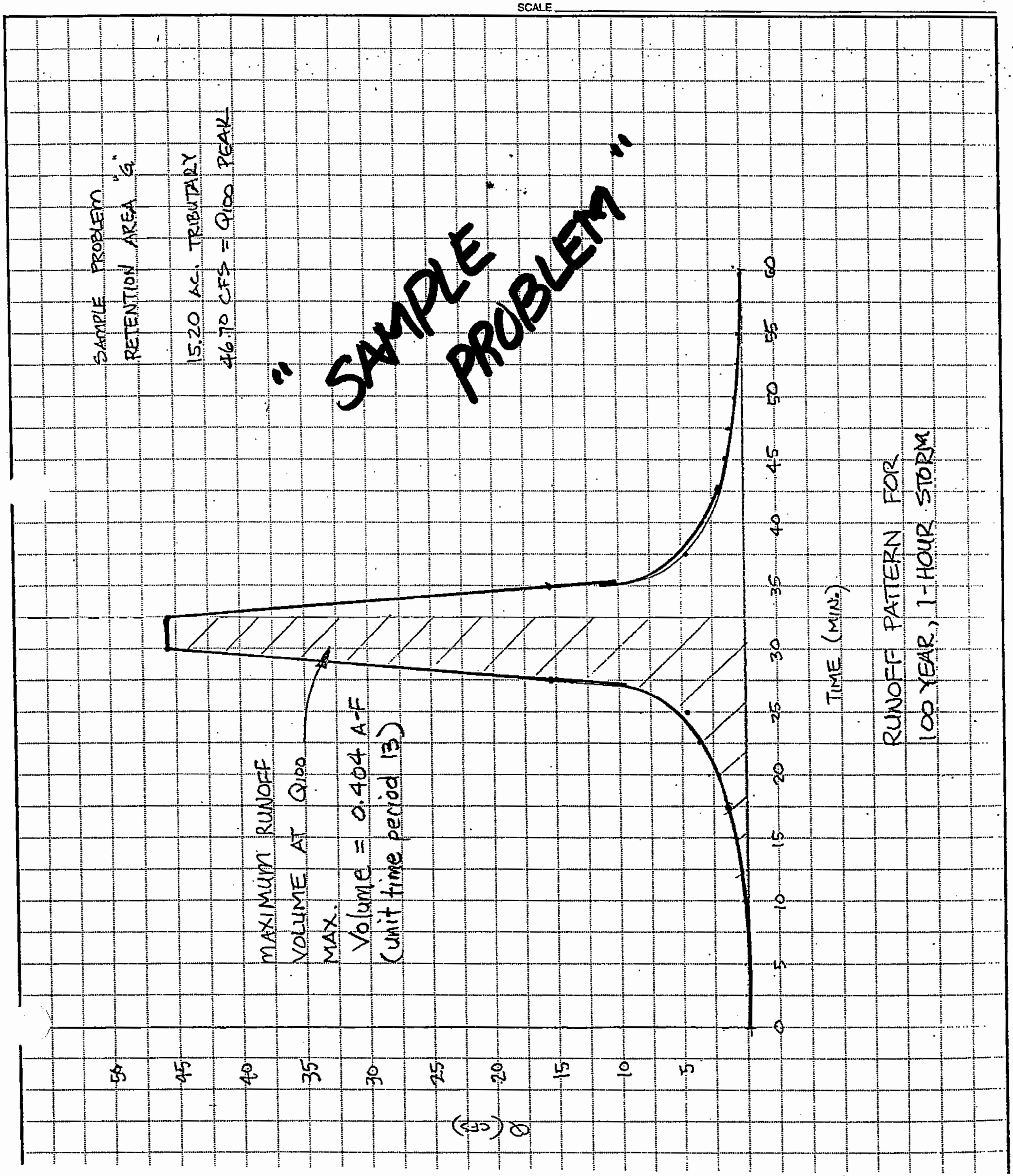
PERIOD	% STORM
13	14.78
14	9.79
15	7.41
16	5.60
17	4.19
18	3.06
19	2.11
20	1.41
21	0.89
22	0.52
23	0.21
24	0.03



RAINFALL PATTERN FOR
100-YEAR, 1-HOUR STORM

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB 1064 RIO VISTA
SHEET NO. ______ OF ______
CALCULATED BY ______ DATE 2-12-01
CHECKED BY ______ DATE ______
SCALE ______



RCFC & WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD Unit Hydrograph, Effective Rain and Retention Basin Calculation Form	Project 1064 Retention Basin D Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	33.79	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	3.18	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.738	[16] RETENTION BASIN PERCOLATION-INCHES	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20] / 100	[22] LOSS RATE in MAX	[22] LOSS RATE in LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.133	0.000	0.000	0.039	0.0001	0.0051	-0.0050	0.000
2.000	0.210	0.003	0.133	0.003	0.000	0.275	0.0009	0.0051	-0.0042	0.000
3.000	0.520	0.008	0.133	0.007	0.001	0.680	0.0023	0.0051	-0.0028	0.000
4.000	0.890	0.014	0.133	0.013	0.001	1.164	0.0040	0.0051	-0.0011	0.000
5.000	1.410	0.023	0.133	0.020	0.002	1.845	0.0064	0.0051	0.0012	0.001
6.000	2.110	0.034	0.133	0.030	0.003	2.761	0.0095	0.0051	0.0044	0.006
7.000	3.060	0.049	0.133	0.044	0.005	4.004	0.0138	0.0051	0.0087	0.014
8.000	4.190	0.067	0.133	0.060	0.007	5.482	0.0189	0.0051	0.0138	0.028
9.000	5.600	0.090	0.133	0.081	0.009	7.327	0.0252	0.0051	0.0201	0.048
10.000	7.410	0.119	0.133	0.107	0.012	9.695	0.0334	0.0051	0.0283	0.076
11.000	9.790	0.157	0.133	0.141	0.024	19.740	0.0680	0.0051	0.0628	0.139
12.000	14.980	0.240	0.133	0.216	0.107	87.643	0.3018	0.0051	0.2967	0.436
13.000	14.980	0.240	0.133	0.216	0.107	87.643	0.3018	0.0051	0.2967	0.733
14.000	9.790	0.157	0.133	0.141	0.024	19.740	0.0680	0.0051	0.0628	0.795
15.000	7.410	0.119	0.133	0.107	0.012	9.695	0.0334	0.0051	0.0283	0.824
16.000	5.600	0.090	0.133	0.081	0.009	7.327	0.0252	0.0051	0.0201	0.844
17.000	4.190	0.067	0.133	0.060	0.007	5.482	0.0189	0.0051	0.0138	0.858
18.000	3.060	0.049	0.133	0.044	0.005	4.004	0.0138	0.0051	0.0087	0.866
19.000	2.110	0.034	0.133	0.030	0.003	2.761	0.0095	0.0051	0.0044	0.871
20.000	1.410	0.023	0.133	0.020	0.002	1.845	0.0064	0.0051	0.0012	0.872
21.000	0.890	0.014	0.133	0.013	0.001	1.164	0.0040	0.0051	-0.0011	0.871
22.000	0.520	0.008	0.133	0.007	0.001	0.680	0.0023	0.0051	-0.0028	0.868
23.000	0.210	0.003	0.133	0.003	0.000	0.275	0.0009	0.0051	-0.0042	0.864
24.000	0.030	0.000	0.133	0.000	0.000	0.039	0.0001	0.0051	-0.0050	0.859
TOTALS					0.3440	281.3081				MAX: .872

EFFECTIVE RAIN = 0.014 INCHES/ACRE

MAX RETENTION = 0.872 ACRE-FT

R:\Documents\1064\Originals\STORMDRAIN CALCS\[jad Unit Hydrograph Effective Rain and E Basin 100 1hr.xls],

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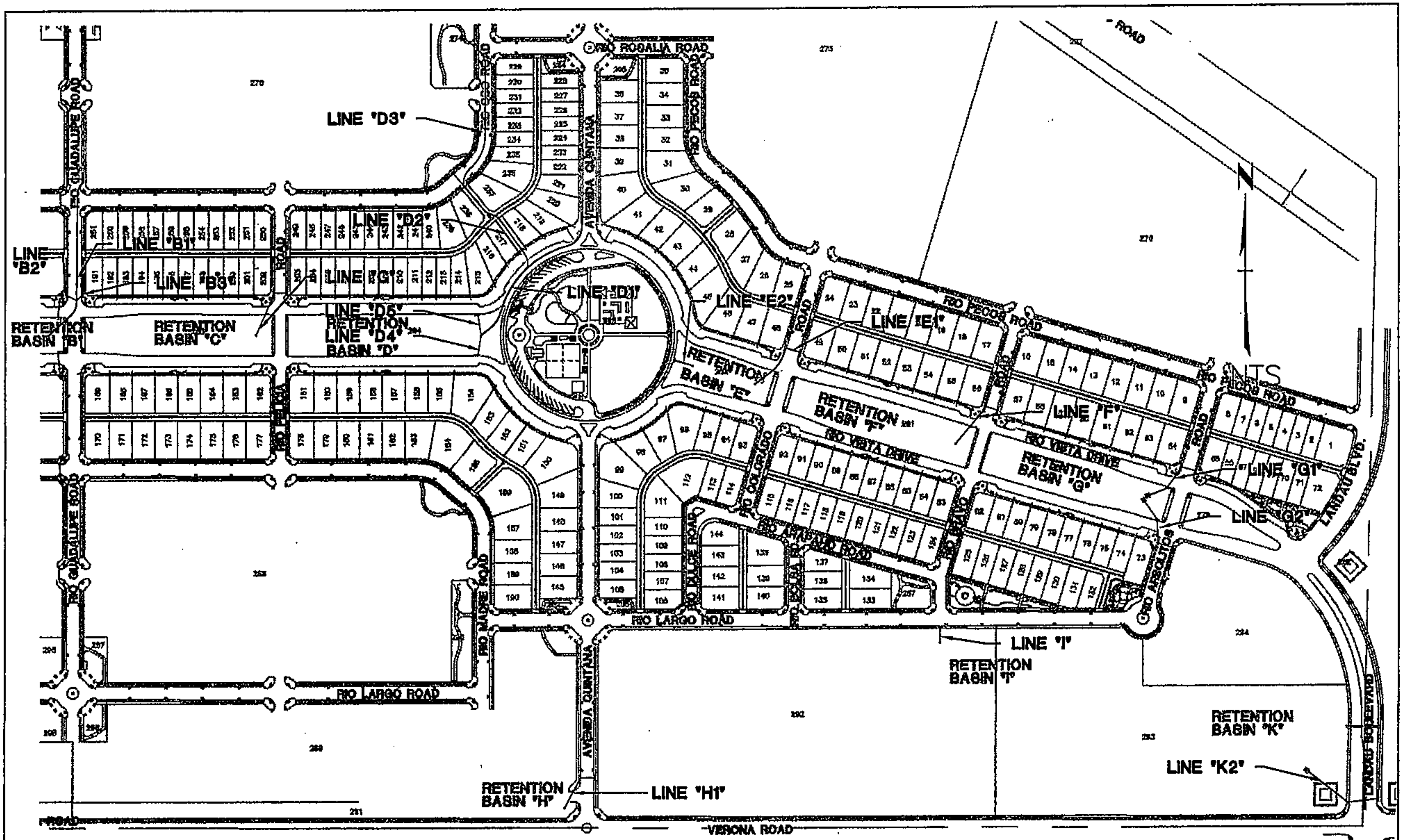
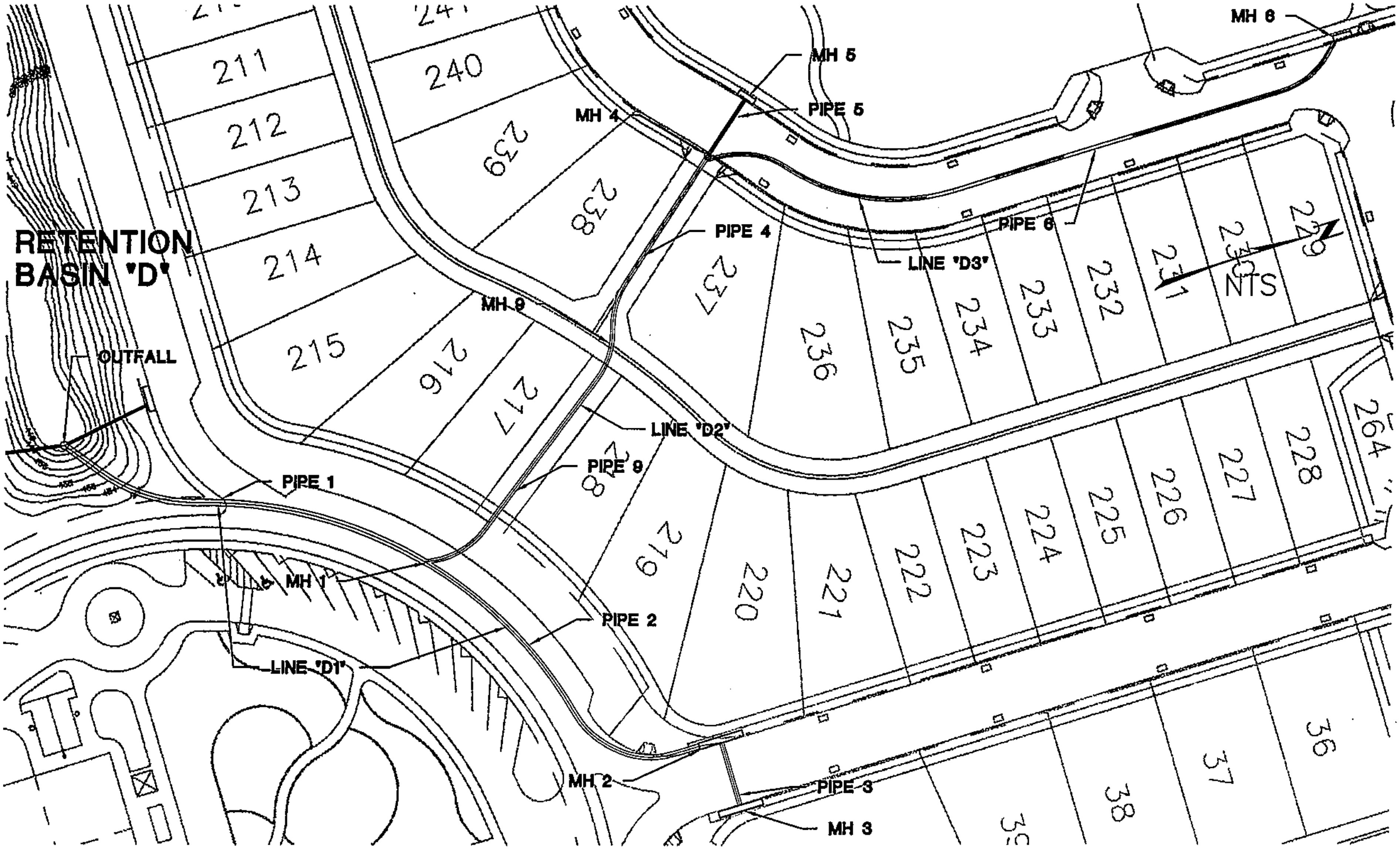
Storm Drain System
Hydraulic Calculations



STORM DRAIN MAP



STORM DRAIN LINE "D1,D2,D3"

Storm Drain Line "D-1, D-2, D-3"

PIPE DESCRIPTION: Pipe 1
—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= CONC
Pipe Length	= 216.07 ft
Plan Length	= 216.07 ft
Pipe Type	= Circular
Pipe Dimensions	= 42.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 63.30 cfs
Invert Elevation Downstream	= 442.42 ft
Invert Elevation Upstream	= 443.28 ft
Invert Slope	= 0.41%
Invert Slope (Plan Length)	= 0.40%
Rim Elevation Downstream	= 447.00 ft
Rim Elevation Upstream	= 453.74 ft
Natural Ground Slope	= 3.12%
Crown Elevation Downstream	= 445.92 ft
Crown Elevation Upstream	= 446.78 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 2.97 min
Total Intensity	= 11.21 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 67.30 cfs
Uniform Capacity	= 63.30 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 449.00 ft
HGL Elevation Upstream	= 449.97 ft
HGL Slope	= 0.46 %
EGL Elevation Downstream	= 449.76 ft
EGL Elevation Upstream	= 450.73 ft
EGL Slope	= 0.46 %
Critical Depth	= 30.87 in
Depth Downstream	= 42.00 in
Depth Upstream	= 42.00 in
Velocity Downstream	= 7.00 ft/s
Velocity Upstream	= 7.00 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 9.62 ft^2
Area Upstream	= 9.62 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.380 ft

—INLET INFORMATION—

Downstream Inlet	= Outfall
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 2

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 2
Downstream Pipe	= Pipe 1
Pipe Material	= CONC
Pipe Length	= 194.96 ft
Plan Length	= 194.96 ft
Pipe Type	= Circular
Pipe Dimensions	= 33.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 33.22 cfs
Invert Elevation Downstream	= 444.07 ft
Invert Elevation Upstream	= 444.84 ft
Invert Slope	= 0.45%
Invert Slope (Plan Length)	= 0.39%
Rim Elevation Downstream	= 453.74 ft
Rim Elevation Upstream	= 453.40 ft
Natural Ground Slope	= -0.17%
Crown Elevation Downstream	= 446.82 ft
Crown Elevation Upstream	= 447.59 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 17.88 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.21 min
Total Intensity	= 12.96 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 35.75 cfs
Uniform Capacity	= 33.22 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 450.35 ft
HGL Elevation Upstream	= 451.24 ft
HGL Slope	= 0.52 %
EGL Elevation Downstream	= 450.91 ft
EGL Elevation Upstream	= 451.80 ft
EGL Slope	= 0.52 %
Critical Depth	= 23.90 in
Depth Downstream	= 33.00 in
Depth Upstream	= 33.00 in
Velocity Downstream	= 6.02 ft/s
Velocity Upstream	= 6.02 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 5.94 ft^2
Area Upstream	= 5.94 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.282 ft

---INLET INFORMATION---

Downstream Inlet	= MH 1
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 3

---RAINFALL INFORMATION---

Return Period	= 100 Year
Rainfall File	= Tutorial

---PIPE INFORMATION---

Current Pipe	= Pipe 3
Downstream Pipe	= Pipe 2
Pipe Material	= CONC
Pipe Length	= 37.00 ft
Plan Length	= 37.00 ft
Pipe Type	= Circular
Pipe Dimensions	= 27.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 19.04 cfs
Invert Elevation Downstream	= 445.75 ft
Invert Elevation Upstream	= 445.89 ft
Invert Slope	= 0.41%
Invert Slope (Plan Length)	= 0.38%
Rim Elevation Downstream	= 453.40 ft
Rim Elevation Upstream	= 453.38 ft

Storm Drain Line "D-1, D-2, D-3"

Natural Ground Slope	= -0.05%
Crown Elevation Downstream	= 448.00 ft
Crown Elevation Upstream	= 448.14 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 17.88 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 17.88 cfs
Uniform Capacity	= 19.04 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 451.52 ft
HGL Elevation Upstream	= 451.80 ft
HGL Slope	= 0.82 %
EGL Elevation Downstream	= 451.83 ft
EGL Elevation Upstream	= 452.11 ft
EGL Slope	= 0.82 %
Critical Depth	= 17.73 in
Depth Downstream	= 27.00 in
Depth Upstream	= 27.00 in
Velocity Downstream	= 4.50 ft/s
Velocity Upstream	= 4.50 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.98 ft^2
Area Upstream	= 3.98 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= MH 2
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %

Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 9

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 9
Downstream Pipe	= Pipe 1
Pipe Material	= CONC
Pipe Length	= 166.71 ft
Plan Length	= 166.71 ft
Pipe Type	= Circular
Pipe Dimensions	= 27.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 41.18 cfs
Invert Elevation Downstream	= 444.02 ft
Invert Elevation Upstream	= 446.97 ft
Invert Slope	= 1.86%
Invert Slope (Plan Length)	= 1.77%
Rim Elevation Downstream	= 453.74 ft
Rim Elevation Upstream	= 460.50 ft
Natural Ground Slope	= 4.05%
Crown Elevation Downstream	= 446.27 ft
Crown Elevation Upstream	= 449.22 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 2.72 min
Total Intensity	= 11.34 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 31.55 cfs
Uniform Capacity	= 41.18 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 450.35 ft
HGL Elevation Upstream	= 452.08 ft
HGL Slope	= 1.09 %
EGL Elevation Downstream	= 451.33 ft
EGL Elevation Upstream	= 453.06 ft
EGL Slope	= 1.09 %
Critical Depth	= 23.24 in
Depth Downstream	= 27.00 in
Depth Upstream	= 27.00 in
Velocity Downstream	= 7.93 ft/s
Velocity Upstream	= 7.93 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.98 ft^2
Area Upstream	= 3.98 ft^2
Kj (JLC)	= 0.00
Calculated Junction Loss	= 0.003 ft

—INLET INFORMATION—

Downstream Inlet	= MH 1
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 4

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 4
Downstream Pipe	= Pipe 9
Pipe Material	= CONC
Pipe Length	= 111.68 ft
Plan Length	= 111.68 ft
Pipe Type	= Circular
Pipe Dimensions	= 27.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 60.81 cfs
Invert Elevation Downstream	= 446.97 ft
Invert Elevation Upstream	= 451.28 ft
Invert Slope	= 3.86%
Invert Slope (Plan Length)	= 3.86%
Rim Elevation Downstream	= 460.50 ft
Rim Elevation Upstream	= 459.28 ft
Natural Ground Slope	= -1.09%
Crown Elevation Downstream	= 449.22 ft
Crown Elevation Upstream	= 453.53 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 2.10 min
Total Intensity	= 11.69 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 31.55 cfs
Uniform Capacity	= 60.81 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 452.08 ft
HGL Elevation Upstream	= 453.22 ft
HGL Slope	= 1.02 %
EGL Elevation Downstream	= 453.06 ft
EGL Elevation Upstream	= 454.38 ft
EGL Slope	= 1.19 %
Critical Depth	= 23.24 in
Depth Downstream	= 27.00 in
Depth Upstream	= 23.24 in
Velocity Downstream	= 7.93 ft/s
Velocity Upstream	= 8.67 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.98 ft^2
Area Upstream	= 3.64 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.584 ft

---INLET INFORMATION---

Downstream Inlet	= MH 9
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 5

---RAINFALL INFORMATION---

Return Period	= 100 Year
Rainfall File	= Tutorial

---PIPE INFORMATION---

Current Pipe	= Pipe 5
Downstream Pipe	= Pipe 4
Pipe Material	= CONC
Pipe Length	= 35.76 ft
Plan Length	= 35.76 ft
Pipe Type	= Circular
Pipe Dimensions	= 21.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 37.56 cfs
Invert Elevation Downstream	= 451.88 ft
Invert Elevation Upstream	= 453.89 ft
Invert Slope	= 6.01%
Invert Slope (Plan Length)	= 5.63%
Rim Elevation Downstream	= 459.28 ft
Rim Elevation Upstream	= 458.65 ft

Storm Drain Line "D-1, D-2, D-3"

Natural Ground Slope	= -1.76%
Crown Elevation Downstream	= 453.63 ft
Crown Elevation Upstream	= 455.64 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 11.66 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 11.66 cfs
Uniform Capacity	= 37.56 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 453.80 ft
HGL Elevation Upstream	= 455.47 ft
HGL Slope	= 4.97 %
EGL Elevation Downstream	= 454.17 ft
EGL Elevation Upstream	= 456.07 ft
EGL Slope	= 5.68 %
Critical Depth	= 15.28 in
Depth Downstream	= 21.00 in
Depth Upstream	= 15.28 in
Velocity Downstream	= 4.85 ft/s
Velocity Upstream	= 6.22 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 2.41 ft^2
Area Upstream	= 1.87 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= MH 4
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %

Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 6
—RAINFALL INFORMATION—
Return Period = 100 Year
Rainfall File = Tutorial

—PIPE INFORMATION—
Current Pipe = Pipe 6
Downstream Pipe = Pipe 4
Pipe Material = CONC
Pipe Length = 378.79 ft
Plan Length = 378.79 ft
Pipe Type = Circular
Pipe Dimensions = 24.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 26.85 cfs
Invert Elevation Downstream = 451.51 ft
Invert Elevation Upstream = 456.85 ft
Invert Slope = 1.52%
Invert Slope (Plan Length) = 1.41%
Rim Elevation Downstream = 459.28 ft
Rim Elevation Upstream = 461.47 ft
Natural Ground Slope = 0.58%
Crown Elevation Downstream = 453.51 ft
Crown Elevation Upstream = 458.85 ft

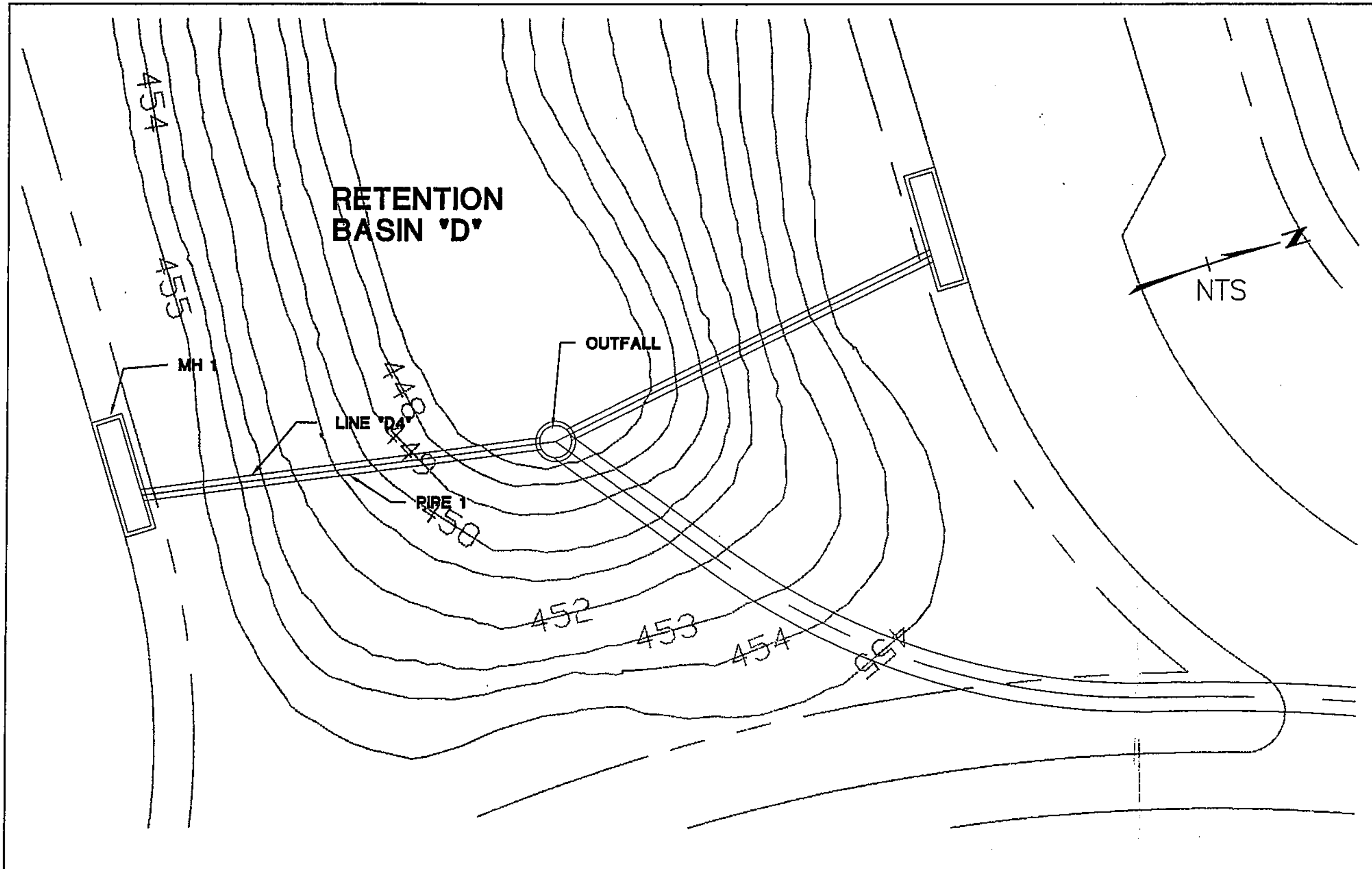
—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 19.89 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 19.89 cfs
Uniform Capacity = 26.85 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

—HYDRAULIC INFORMATION—
HGL Elevation Downstream = 453.80 ft
HGL Elevation Upstream = 458.87 ft
HGL Slope = 1.44 %
EGL Elevation Downstream = 454.42 ft
EGL Elevation Upstream = 459.72 ft
EGL Slope = 1.51 %
Critical Depth = 19.23 in
Depth Downstream = 24.00 in
Depth Upstream = 19.23 in
Velocity Downstream = 6.33 ft/s
Velocity Upstream = 7.37 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 3.14 ft^2
Area Upstream = 2.70 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = NA

—INLET INFORMATION—
Downstream Inlet = MH 4
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag

Storm Drain Line "D-1, D-2, D-3"

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



STORM DRAIN LINE "D4"

Storm Drain Line "D-4"

PIPE DESCRIPTION: Pipe 1

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= RCP
Pipe Length	= 50.19 ft
Plan Length	= 50.19 ft
Pipe Type	= Circular
Pipe Dimensions	= 18.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 44.21 cfs
Invert Elevation Downstream	= 442.07 ft
Invert Elevation Upstream	= 450.97 ft
Invert Slope	= 17.81%
Invert Slope (Plan Length)	= 17.73%
Rim Elevation Downstream	= 447.00 ft
Rim Elevation Upstream	= 454.71 ft
Natural Ground Slope	= 15.36%
Crown Elevation Downstream	= 443.57 ft
Crown Elevation Upstream	= 452.47 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 9.52 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 9.52 cfs
Uniform Capacity	= 44.21 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

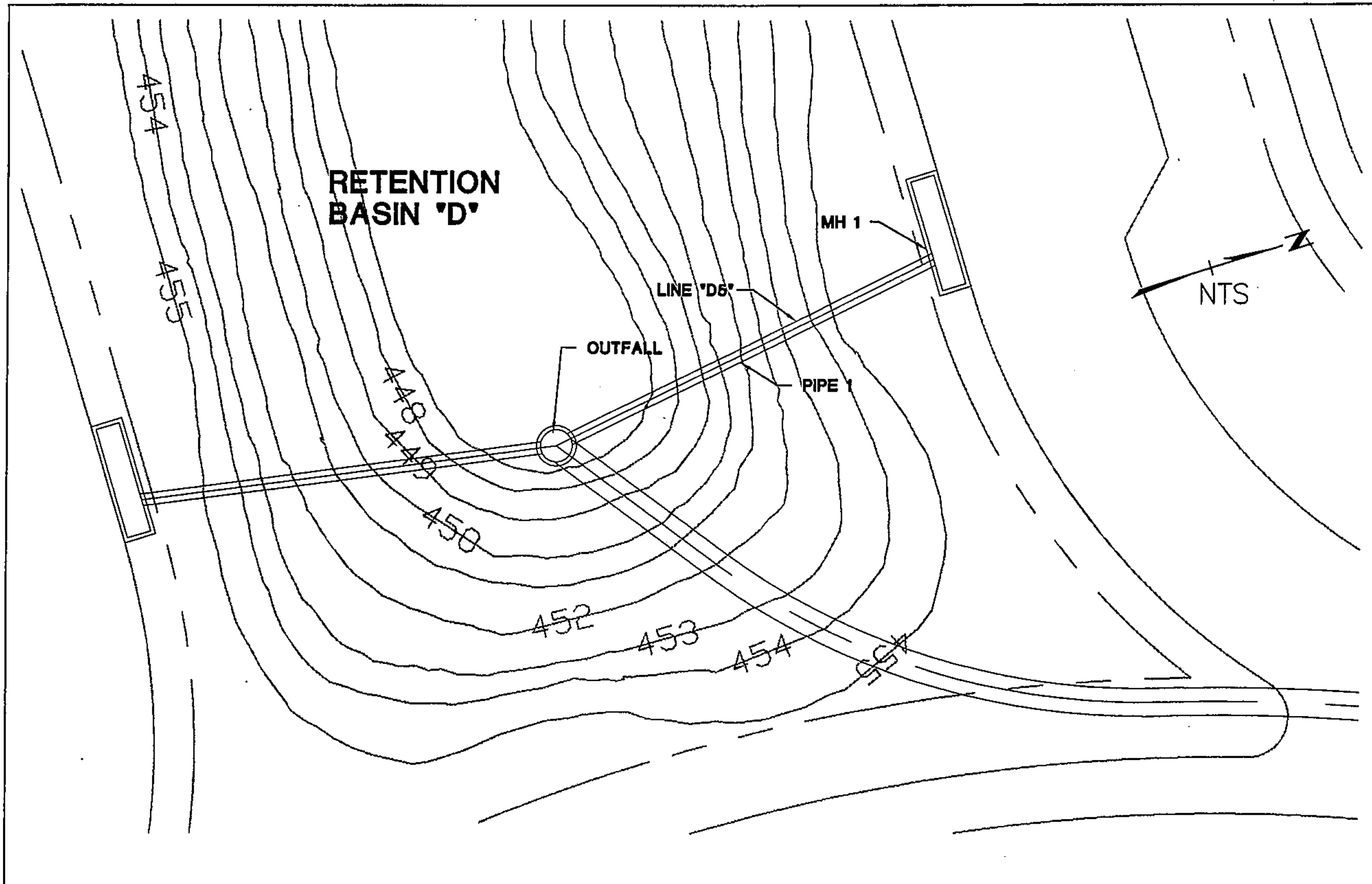
HGL Elevation Downstream	= 449.00 ft
HGL Elevation Upstream	= 452.47 ft
HGL Slope	= 6.95 %
EGL Elevation Downstream	= 449.45 ft
EGL Elevation Upstream	= 453.10 ft
EGL Slope	= 7.29 %
Critical Depth	= 14.30 in
Depth Downstream	= 18.00 in
Depth Upstream	= 14.30 in
Velocity Downstream	= 5.39 ft/s
Velocity Upstream	= 6.32 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 1.77 ft^2
Area Upstream	= 1.51 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= Outfall
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag

Storm Drain Line "D-4"

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



STORM DRAIN LINE "D5"

Storm Drain Line "D-5"

PIPE DESCRIPTION: Pipe 1
—RAINFALL INFORMATION—
Return Period = 100 Year
Rainfall File = Tutorial

—PIPE INFORMATION—
Current Pipe = Pipe 1
Downstream Pipe = Outfall
Pipe Material = RCP
Pipe Length = 50.19 ft
Plan Length = 50.19 ft
Pipe Type = Circular
Pipe Dimensions = 18.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 46.77 cfs
Invert Elevation Downstream = 440.92 ft
Invert Elevation Upstream = 450.88 ft
Invert Slope = 19.93%
Invert Slope (Plan Length) = 19.84%
Rim Elevation Downstream = 447.00 ft
Rim Elevation Upstream = 454.71 ft
Natural Ground Slope = 15.36%
Crown Elevation Downstream = 442.42 ft
Crown Elevation Upstream = 452.38 ft

—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 10.66 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 10.66 cfs
Uniform Capacity = 46.77 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

—HYDRAULIC INFORMATION—
HGL Elevation Downstream = 449.00 ft
HGL Elevation Upstream = 452.49 ft
HGL Slope = 6.98 %
EGL Elevation Downstream = 449.57 ft
EGL Elevation Upstream = 453.20 ft
EGL Slope = 7.27 %
Critical Depth = 15.04 in
Depth Downstream = 18.00 in
Depth Upstream = 15.04 in
Velocity Downstream = 6.03 ft/s
Velocity Upstream = 6.76 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 1.77 ft^2
Area Upstream = 1.58 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = NA

—INLET INFORMATION—
Downstream Inlet = Outfall
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag

Storm Drain Line "D-5"

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

Catch Basin Calculations

TRACT 28639-1 RIO VISTA VILLAGE

STA: 26+07.88 (W) AVE. QUINTANA

CATCH BASIN CAPACITY CHARTS

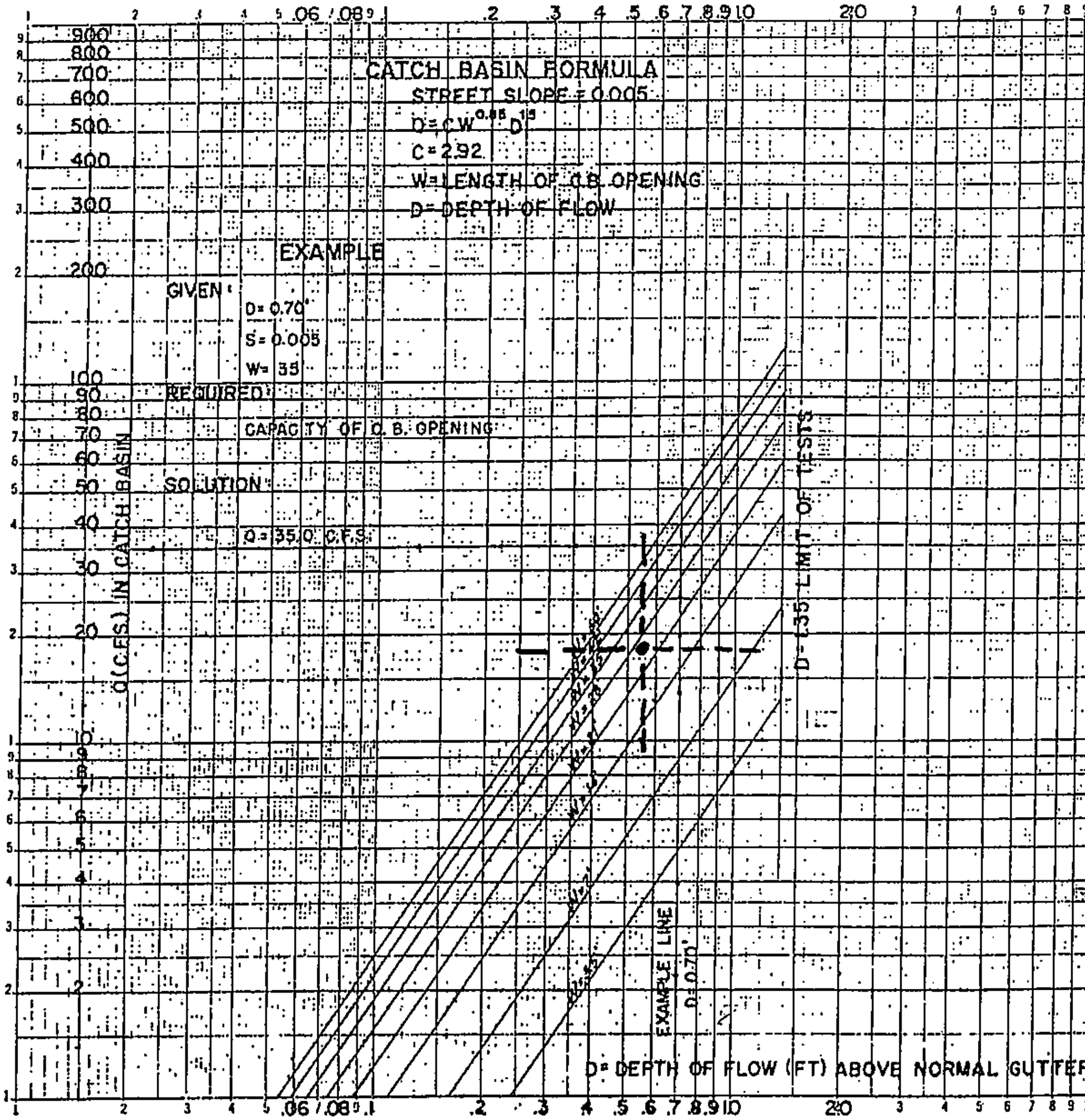
D = 0.55' W = 24.20

ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

Q = 17.875 USE: W = 25'

LINE: D-1, MH 2

OFFICE STANDARD NO 108



TABULATION SHEETS: 117, 123, 124 & 138 — CHART LL-13

W=VARIES

C.B. NO 39 & 40, STD. PLAN B-2539 & B-2840

L.D. NO 3, CASE I, STD. PLAN D-1993 (L=6', K=3', W=4')

S=0.005, NO CROSSFALL

CROWN, H=0.0125 RDWY. WIDTH

8" NORMAL C.F.; 11.5" C.F. AT C.B.

NOTES:

1. THIS CHART GIVES CAPACITIES AS DEVELOPED FROM EXPERIMENTAL HYDRAULIC MODEL STUDIES FOR CATCH BASIN NO 40 TYPE CURB OPENINGS WITH STANDARD LOCAL DEPRESSIONS AND MAY BE USED IN DETERMINING THE LENGTH ("W") AND/OR THE CAPACITY ("Q") OF BASIN OPENINGS OF THIS TYPE UNDER VARIOUS VALUES OF "D".

2. THIS CHART IS APPLICABLE ONLY TO CONDITIONS SHOWN ON FIGURE 2.

C.B. NO 40 TYPE CURB OPENING

DESIGN CHART LL-13

SIDE-OPENING CATCH BASIN CAPACITIES		
BUREAU OF ENGINEERING - CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS STORM DRAIN DESIGN DIVISION		
W.O. 31212		MARCH 1955
DESIGN: F.J.D. 3-17-55		DRAWN: O.G.S. 3-18-55

TRACT 28639-1 RIO VISTA VILLAG_

STA: 26+07.88 (E) AVE. QUINTANA

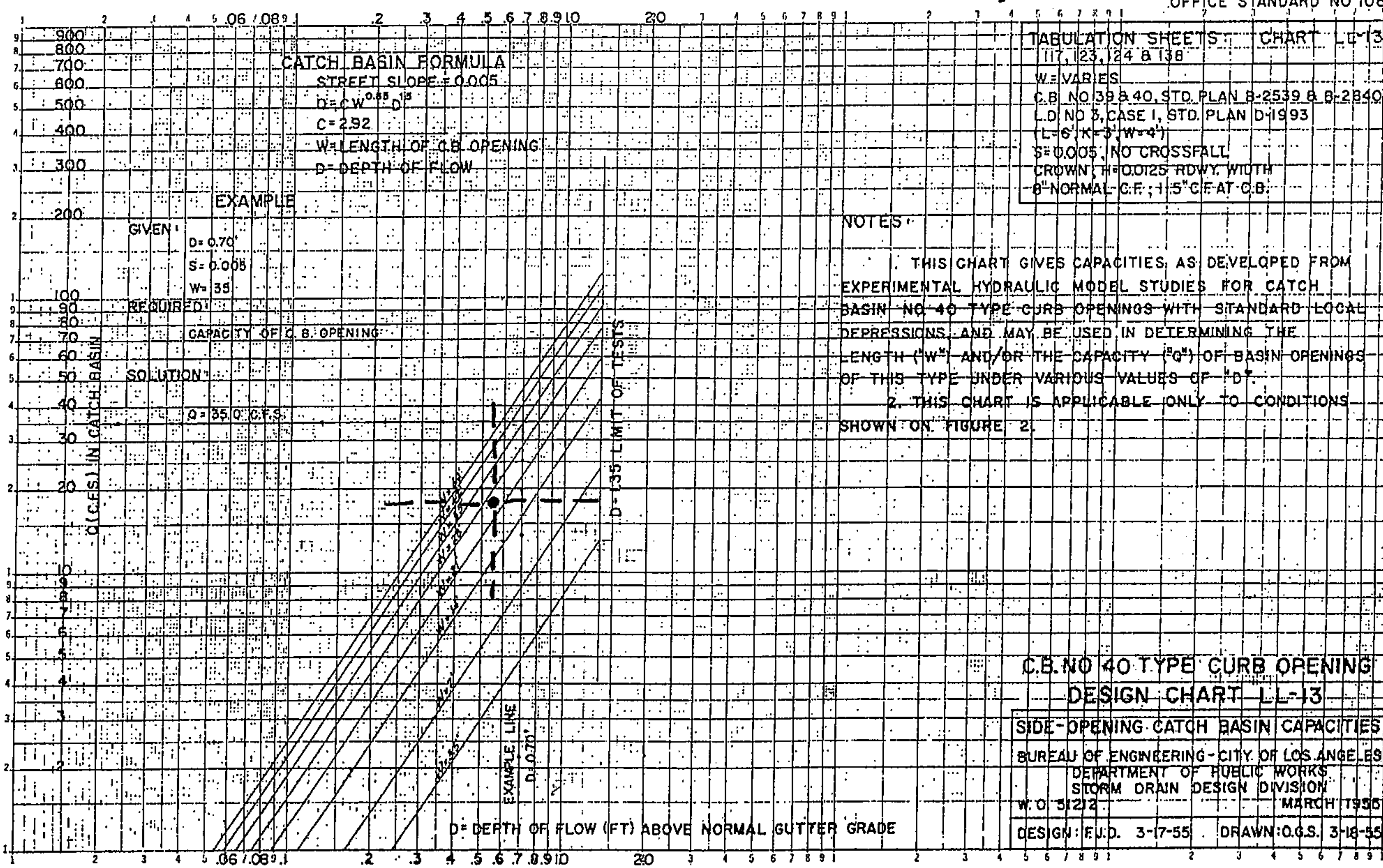
CATCH BASIN CAPACITY CHARTS

$D = 0.55'$ $W = 24.20$

ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

$Q = 17.875$ USE: $W = 25'$

LINE: D-1, MH 3



TRACT 28639-1 RIO VISTA VILLA

CATCH BASIN CAPACITY CHARTS

SUMP CONDITION : $W = \left[Q/1.62 \right]^{0.88496}$

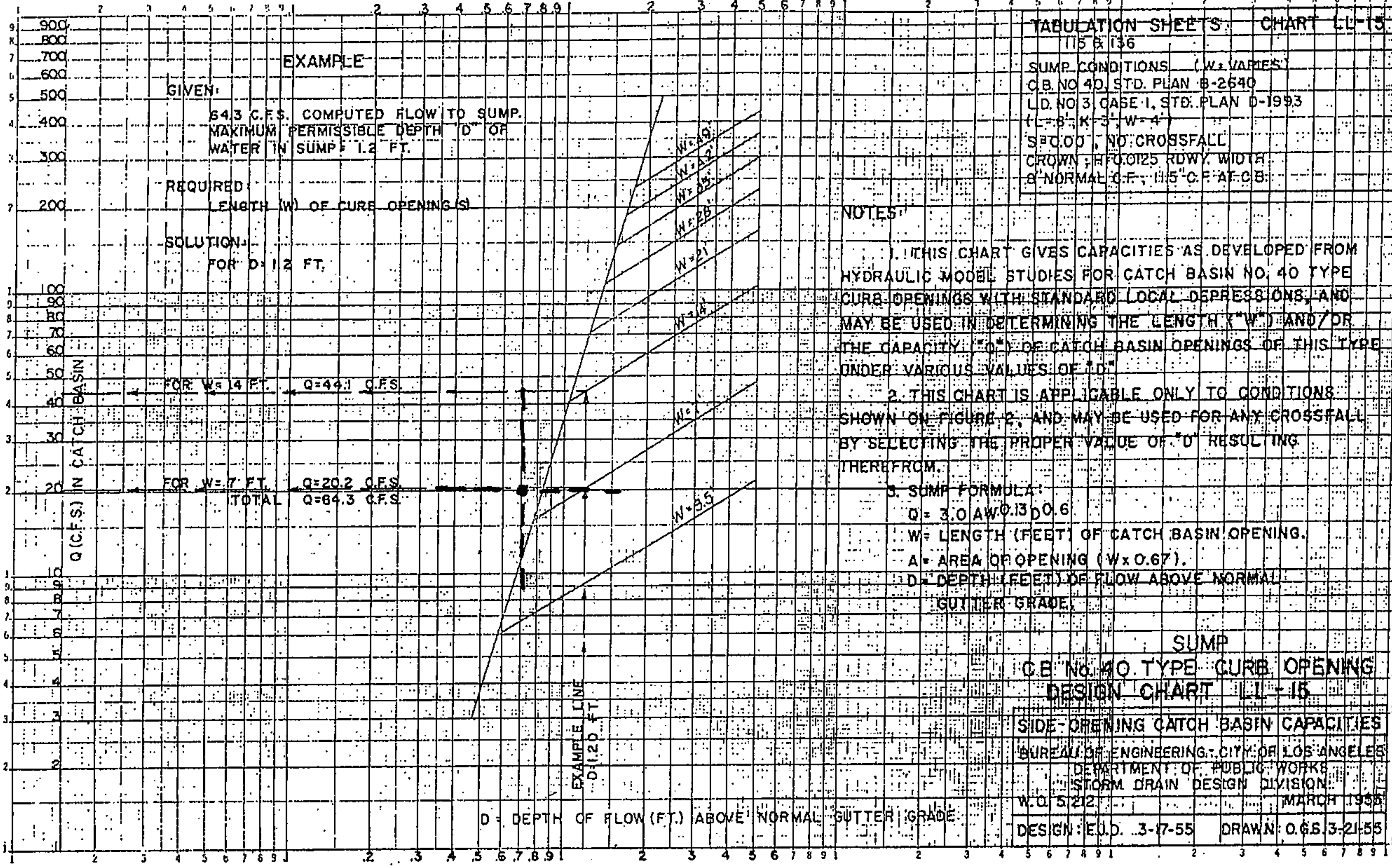
STA: 15+25.00(N) RIO 050

D = 0.7' W = 9.16

Q = 19.79 USE: W = 10'

LINE: D-2, MH 5

OFFICE STANDARD NO. 108



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

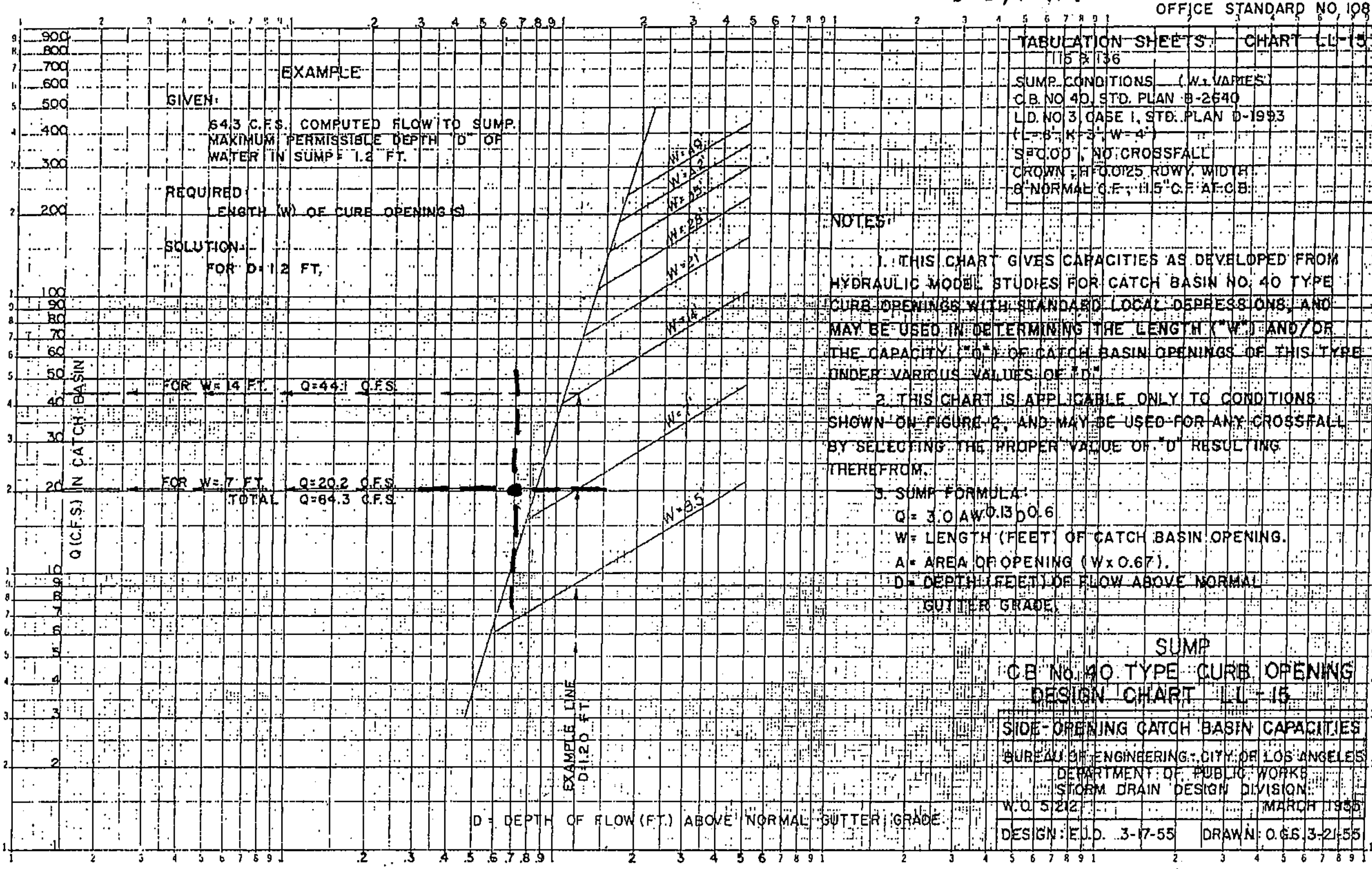
SUMP CONDITION : $W = \left[Q/1.62\right]^{0.88496}$

STA : 11+52.00(W) RIO OSO

D = 0.7' W = 9.2

Q = 19.89 USE : W = 10'

LINE : D-3, MH6



TRACT 28639-1 RIO VISTA VILLA

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

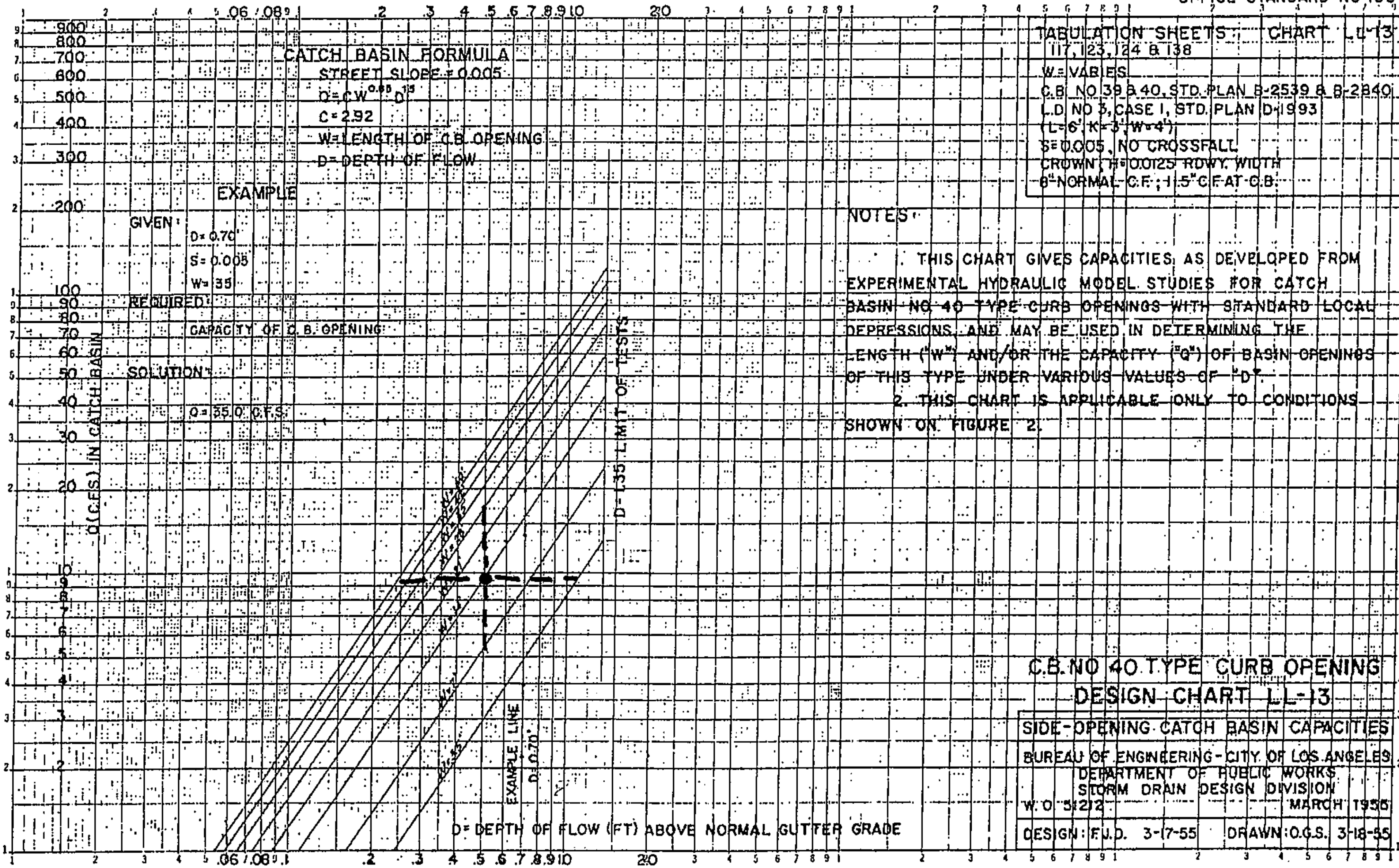
STA: 66+21.30(S) RIO VISTA DR.

D = 0.51' W = 13.179

Q = 9.52 USE: W = 14'

LINE: D-4, MH 1

OFFICE STANDARD NO 108



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

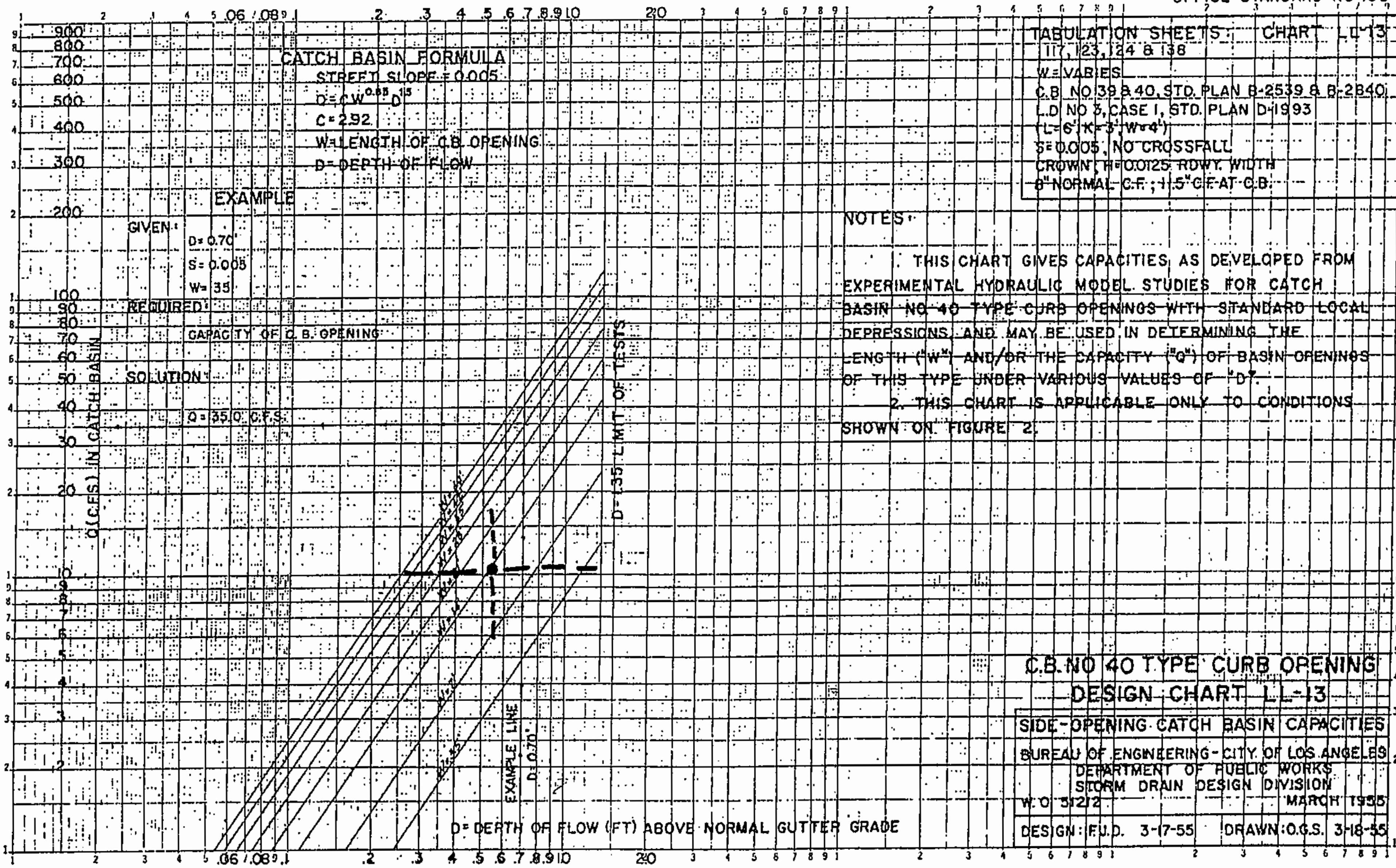
ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

STA: 66+21.30 (N) RIO VISTA DR.

D = 0.55'   W = 13.17'

Q = 10.66   USE: W = 14'

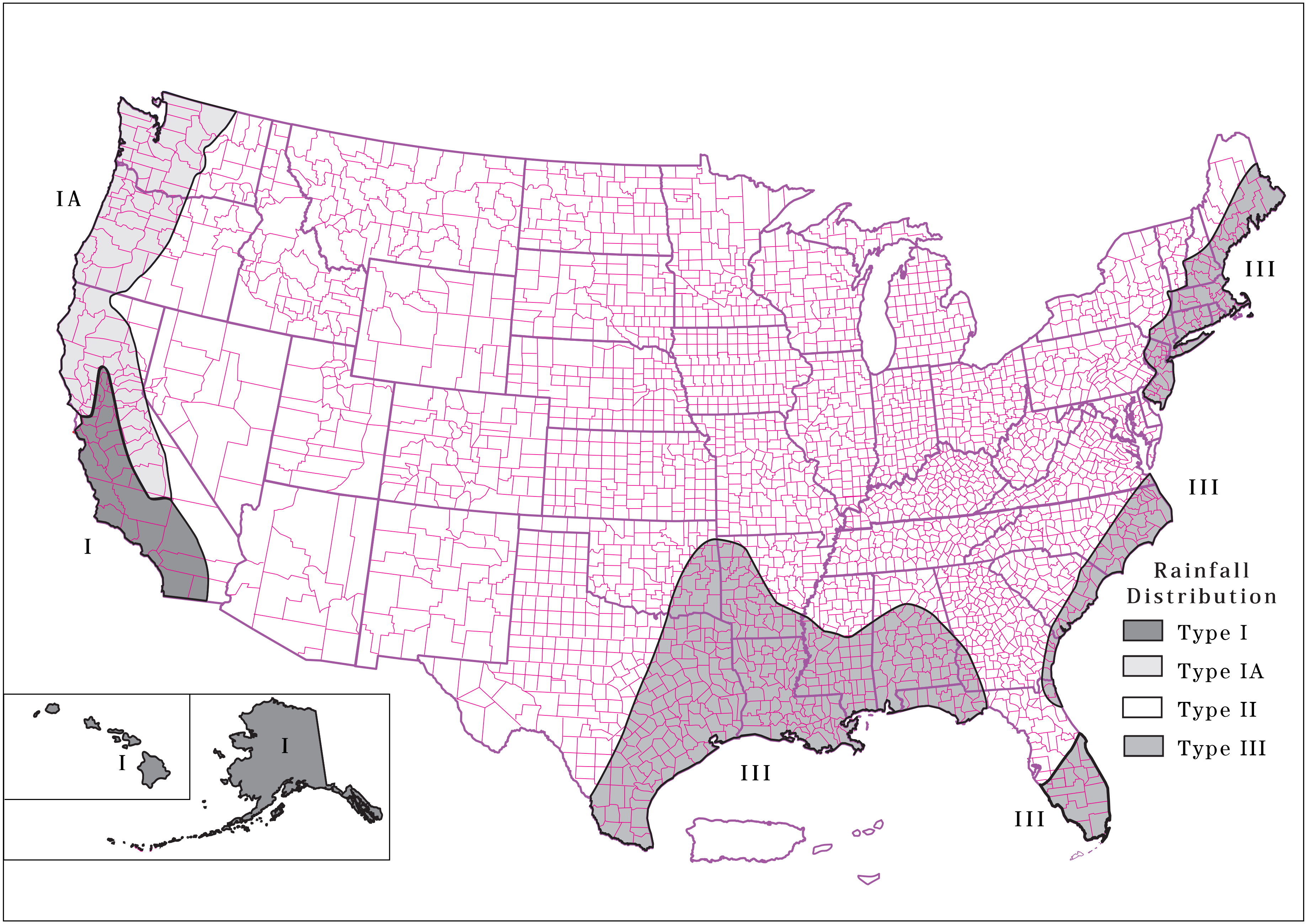
LINE: D-5, MH 1



APPENDIX 9

SUPPORTING DOCUMENTS

Figure B-2 Approximate geographic boundaries for NRCS (SCS) rainfall distributions



Runoff Coefficients (C)

Area Description	Coefficient Value	Typical Design
Business:		
Central business	0.70 - 0.95	
District and local	0.50 - 0.70	
Residential:		
Single family	0.35 - 0.45	
Multi-units detached	0.40 - 0.75	
Suburban	0.25 - 0.40	
Apartments	0.50 - 0.70	
Industrial:		
Light	0.50 - 0.80	
Heavy	0.60 - 0.90	
Parks, **cemeteries**	0.10 - 0.25	
Playgrounds	0.20 - 0.35	
Railroad yards	0.20 - 0.40	
Lawns		
Sandy soil	0.05 - 0.20	
Heavy soil	0.18 - 0.35	0.30
Unimproved	0.10 - 0.30	0.20
Asphaltic	0.70 - 0.95	0.90
Concrete	0.80 - 0.95	0.90
Roofs	0.75 - 0.95	0.90

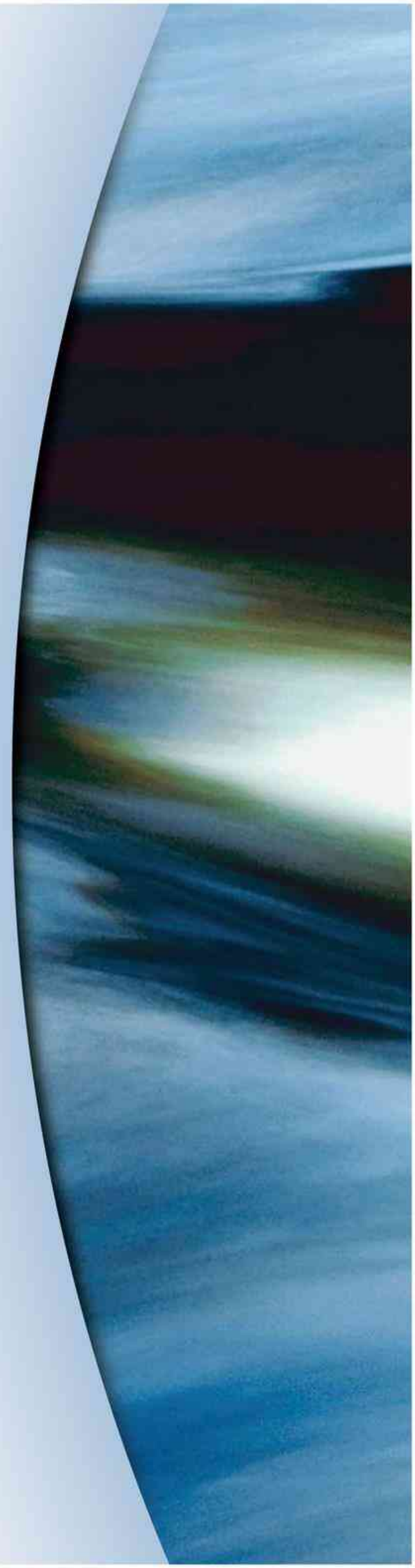
Source: ASCE

The following table shows SCS curve number values, according to the SCS method for runoff calculations. Please scroll down for a description of the soil groups.

SCS Curve Numbers (CN)

Description of Land Use	**Hydrologic Soil Group**			
	A	**B**	**C**	**D**
Paved parking lots, roofs, driveways	98	98	98	98
Streets and Roads				
Paved with curbs and storm sewers	98	98	98	98
Gravel	76	85	89	91
Dirt	72	82	87	89
Cultivated (Agricultural Crop) Land				
Without conservation treatment (no terraces)	72	81	88	91
With conservation treatment (terraces, contours)	62	71	78	81
Pasture or Range Land				
Poor (<50% ground cover or heavily grazed)	68	79	86	89
Good (50-75% ground cover; Not heavily grazed)	39	61	74	80
Meadow (grass, no grazing, mowed for hay)	30	58	71	78
Brush (good, >75% ground cover)	30	48	65	73
Woods and Forests				
Poor (small trees/brush destroyed by over-grazing or burning)	45	66	77	83
Fair (grazing but not burned; some brush)	36	60	73	79
Good (no grazing; brush covers ground)	30	55	70	77
Open Spaces (lawns, parks, golf courses, cemeteries, etc.)				
Fair (grass covers 50 – 75% of area)	49	69	79	84
Good (grass covers >75% of area)	39	61	74	80
Commercial and Business Districts (85% impervious)	89	92	94	95
Industrial Districts (72% impervious)	81	88	91	93
Residential Areas				
1/8 acre lots, about 65% impervious	77	85	90	92
1/4 acre lots, about 38% impervious	61	75	83	87
1/2 acre lots, about 25% impervious	54	70	80	85
1 acre lots, about 20% impervious	51	68	79	84

Group A Soils: High infiltration (low runoff). Sand, loamy sand, or sandy loam. Infiltration rate > 0.3 in/hr when wet.
Group B Soils: Moderate infiltration (moderate runoff). Silt loam or loam. Infiltration rate 0.15 – 0.30 in/hr when wet.
Group C Soils: Low infiltration (moderate to high runoff). Sandy clay loam. Infiltration rate 0.05 – 0.150 in/hr when wet.
Group D Soils: Very low infiltration (high runoff). Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 – 0.05 in/hr when wet.



FUSCOE ENGINEERING

HYDROLOGY AND HYDRAULICS REPORT

VERANO-Rio Vista Village

TTM 38710, 38711 & 38712

Cathedral City, CA

Prepared For
NCP Verano, LLC
690 E Green Street, Suite 200
Pasadena, CA 91101
ph.(323) 874-8000

Prepared By

Ray P. Erillo, PE
Fuscoe Engineering, Inc.
2850 Inland Empire Blvd. Building B
Ontario, California, 91764
909.581.0676
www.fuscoe.com

Project Manager:
Steve Ellis, PE.

Date Prepared: June 2023
Revised 1 :
Job Number : 4090-01

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HYDROLOGY AND HYDRAULICS REPORT

VERANO - RIO VISTA VILLAGE
TTM 38710, 38711 & 38712

City of Cathedral City, CA 92234
Riverside County

Prepared for:

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Tel. 909-581-0676

Date Prepared: June 2023
Revision 1 :
Revision 2 :

Table of Contents

1.0 INTRODUCTION

1.1 GEOGRAPHIC SETTING

The proposed Verano project will be part of the master planned community named Rio Vista Village at Cathedral City, California. This report focuses on the portion of the Verano project (herein known as the "project") that is located within Drainage areas A and B as identified in the Rio Vista Village Master Plan Drainage Alternative report, dated March 2000, and the Drainage Report Tract 28639-1 for Rio Vista Village, dated May 2001. The project encompasses TTM 38711, a portion of TTM 38710, and a portion of TTM 38712. The total project site is approximately 43.78 acres with a net disturbed area of 43.78 acres. It is bounded by an empty lot to the north, Rio Guadalupe Rd to the east, Morongo Stormwater Channel to the west, and Rio Vista Dr and future lots to the south.

The project site is vacant and undeveloped under its existing conditions. Adjacent development surrounding the area site includes single family residences, a stormwater channel, and undeveloped areas. See Figure 1 below for the project location map.

There is no existing storm drain system on site. There are existing Retention Basins A and B located in between Rio Vista Dr that will be utilized for this project. The proposed project consists of the construction of various buildings, landscape areas, drive aisles, sidewalks, parking areas, wall, water quality BMPs and wet/dry utilities.

1.2 PURPOSE OF THIS REPORT

The purpose of this report is to accomplish the following objective:

To determine hydrologic impacts resulting from the proposed development. Impacts are determined based on the comparison between the pre-development condition and the post-development condition. This hydrology report will also provide the peak flow rates for 10-year and 100-year at 24hr duration for post development condition and determine if the proposed storm drain system will be sufficient to convey the runoff generated by the proposed improvements. 100yr-24Hr Storm frequency unit Hydrograph will be used to calculate the runoff volume generated at post condition. Post development condition will upgrade the existing Retention Basins A and B to accommodate the runoff volume per the proposed development. This will be considered in evaluating the peak flow rate after retention.

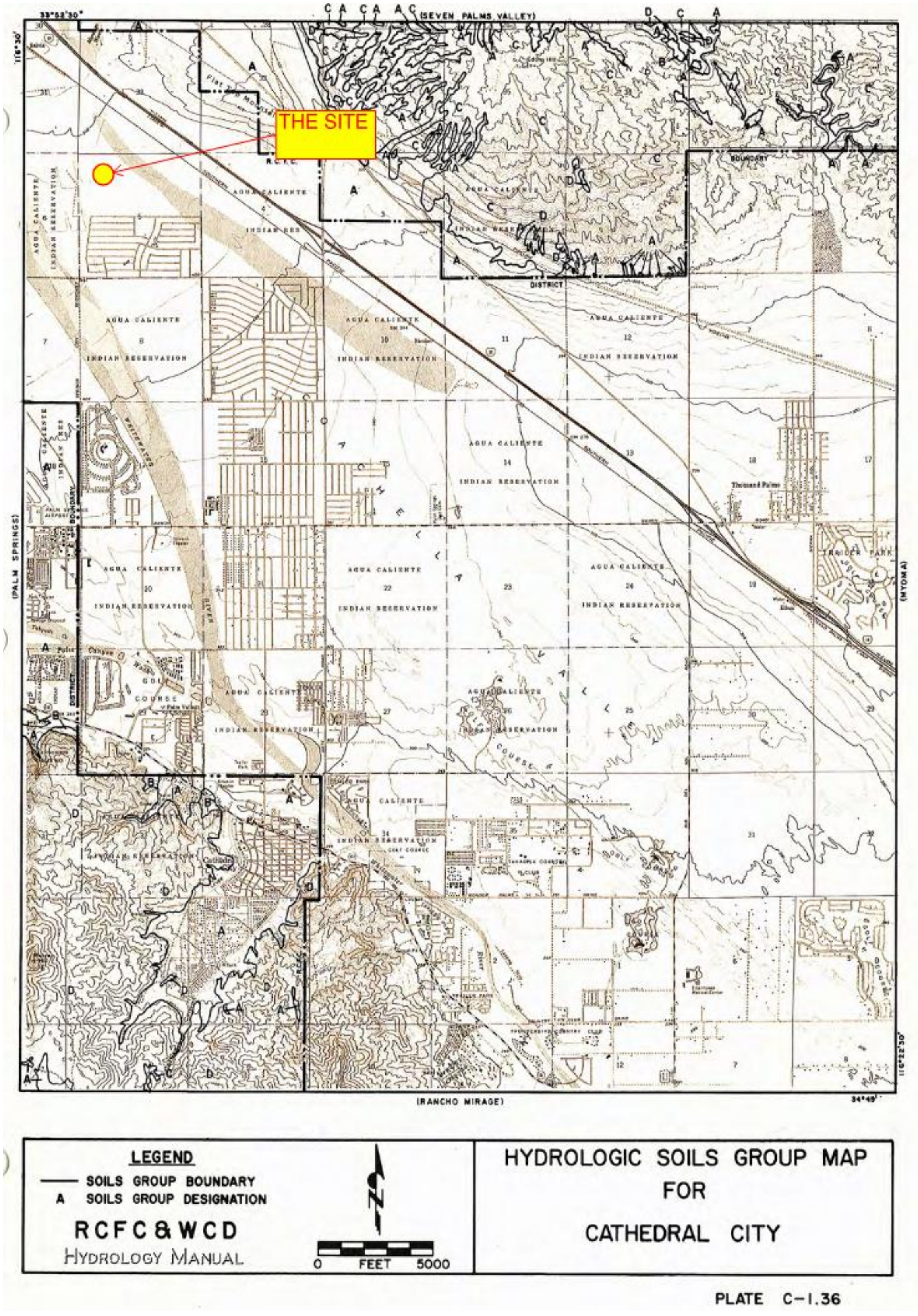
1.3 REFERENCES

- Riverside County Flood Control and Water Conservation District (RCFC & WCD) Hydrology Manual
- Approved Master WQMP (M-WQMP) for Rio Vista Village dated April 29, 2015
- Approved Rio Vista Village Master Plan of Drainage Alternative report dated April 5, 2000
- Approved Drainage Report, Tract 28639-1, Rio Vista Village report dated May 4, 2001

1.4 PROJECT SITE LOCATION MAP

Figure 1

1.5 HYDROLOGIC SOILS GROUP MAP FOR CATHEDRAL CITY



2.0 PRE-DEVELOPMENT CONDITION

2.1 PRE-DEVELOPMENT TOPOGRAPHY

The project site is vacant and undeveloped under existing conditions. Adjacent land uses include single family residences, a stormwater channel, and undeveloped property. The pre-development drainage area is approximately 43.03 acres. The overall property moderately slopes downward to the southerly direction towards the existing retention basins.

2.2 PRE-DEVELOPMENT DRAINAGE SYSTEM

The existing site is an undeveloped property with no storm drain system within the site. The project site is located within Drainage areas EX-A (19.50 Ac) and EX-B (23.53Ac) as identified in the Rio Vista Village Master Plan Drainage Alternative report, dated March 2000, and the Drainage Report Tract 28639-1 for Rio Vista Village, dated May 2001. The storm runoff from the site sheet flows towards the southerly direction to the existing retention basins A and B located between Rio Vista Drive. These runoffs will be part of the Whitewater watershed area which will drain to Whitewater River then to the Coachella Valley Storm Water Channel.

3.0 POST DEVELOPMENT CONDITION

3.1 POST DEVELOPMENT

The proposed development includes single-family residences, landscape areas, parking lots, and drive aisles. This proposed development will increase the impervious area of the site to 65%. The post-development drainage area for this development is approximately 43.77 acres. This development will upgrade the existing Retention Basins, A and B, based on the proposed conditions, for treatment control as well as to address flood control requirements. Per the M-WQMP, the basins were designed with the capacity to retain for the 100-year, 24-hour storm event which will also be the criteria for upgrade of the basins. This means the design of the existing basin exceed the current NPDES WQMP requirements per Cathedral City Municipal Code Title 8 § 8.24.070 requiring a minimum storage for 100yr-3Hr duration storm event. The Autodesk Civil3D Hydraflow Unit Hydrograph and RCFC & WCD data was utilized to calculate this. Runoff from the proposed development site will sheet flow through the curb and gutters then to the on-site storm drain system and eventually to the proposed retention basins, A and B. A catch basin filter insert will be used as pre-filter.

In addition, the improvements will also include installation of appropriate drainage facilities, other dry and wet utilities, and LID BMPs to mitigate water quality objectives.

3.2 PROPOSED DRAINAGE FACILITY

This post development condition will have two drainage areas as shown on the Post Development Drainage Maps. Drainage area P-A is approximately 11.13 Ac and P-B is 32.64 Ac which will have a total post development drainage area of 43.77 Ac. Drainage P-A decreased it size by 8.37 Ac while Drainage Area P-B increased by 9.11 Ac due to the proposed land development configuration. These drainage areas will respectively drain to its corresponding catch basins then to the on-site storm drain system which will ultimately flow towards the proposed Retention Basins, A and B. Discharge peak flow rates will be calculated per 100yr-24hr storm event. The capacity of the street and catch basins will also be designed per 100-yr storm event. The proposed development peak flow rate must also not exceed pre-development condition at 100yr-24h4 storm frequency. This will be achieved by the utilization of the existing retention basins.

Proposed drainage structures and pipes are shown in the Hydrology Maps in Appendix 5.

4.0 HYDROLOGY AND HYDRAULIC STUDY

4.1 METHODOLOGY

This study was prepared in conformance with the Riverside County Hydrology Manual. Autodesk Civil3D Hydraflow Unit Hydrograph Calculator with the rainfall intensity and precipitation data from RCFC & WCD was used to determine the hydrograph volume based on 100-year, 24hr storm duration. Soil type "A" was used for the site per the RCFC & WCD Hydrologic Soil Map for Cathedral City (Plate C-1.36) Methodology and supportive data for the hydrologic calculations may be found in this report, and in the "Riverside County Flood Control and Water Conservation District Hydrology Manual".

The results of the analysis are included in this report in Appendix 2 and 4.

5.0 RESULTS AND CONCLUSIONS

The purpose of this drainage analysis is to identify the need to keep the post-development runoff volume and peak flow rate the same as the pre-development condition by upgrading the existing retention basin. Riverside County Flood Control District and Water Conservation District requires that the difference in runoff hydrograph volume between the "post-developed" condition and the "pre-developed" condition for the 100hr-24hr storm frequency must be detained on-site. The rainfall volume for the pre-developed condition is 85,427 C.F. and 103,760 C.F. for drainage area EX-A and EX-B, respectively. The post developed rainfall volume is 82,547 C.F and 244,175 C.F. for drainage areas P-A and P-B, respectively. Hence, the difference in pre and post developed runoff volume reduced to -2,880 C.F. for Drainage Area P-A due to smaller drainage area at post development condition while 140,415 C.F. for Drainage Area P-B. Meanwhile, the capacity of the upgraded retention basins was calculated to be 168,098 C.F. for Basin A and 319,748 C.F. for Basin B, which is adequate to meet flood control requirements. Furthermore, by utilizing the proposed retention basins, it was noted that the post development peak flow was effectively reduced to 3.94 cfs for Drainage Area A and 7.08 cfs for Drainage Area B at 100yr-24hr storm frequency which is below the existing condition of 13.31 cfs and 13.48 cfs, respectively. Lastly, it has been determined that the proposed storm drain system can convey runoff generated at 100-year storm events. Therefore, the proposed development meets the WQMP and flood requirements for this project and will not result in an adverse effect to the community.

EXISTING CONDITIONS 10YR-24HR & 100YR-24HR STORM EVENT

ID	Area (acre)	Tc, min	Q10 (cfs)	Q100 (cfs)
EX-A	19.50	48.8	1.50	13.31
EX-B	23.53	61.2	1.57	13.48
TOTAL	**43.03**			

PROPOSED CONDITIONS 10YR-24HR & 100YR-24HR STORM EVENT

ID	Area (acre)	Tc, min	Q10 (cfs)	Q100 (cfs)
P-A1	3.78	41.9	1.50	5.44
P-A2	2.05	38.7	0.86	3.11
P-A3	3.09	29.8	1.60	5.69
P-A4	2.22	20.2	1.36	4.81
TOTAL (P-A)	**11.13**		**5.32**	**19.05**
P-B1	1.09	21.4	0.67	2.37
P-B2	2.12	33.6	1.02	3.66
P-B3	0.99	19.2	0.67	2.34
P-B4	2.00	31.5	0.96	3.45
P-B5	1.42	20.0	0.96	3.36
P-B6	2.11	31.0	1.02	3.64
P-B7	1.30	20.5	0.80	2.83
P-B8	1.95	27.6	1.01	3.59
P-B9	2.67	31.6	1.28	4.61
P-B10	1.55	24.5	0.87	3.06
P-B11	1.55	24.5	0.87	3.06
P-B12	2.53	28.3	1.31	4.66
P-B13	2.28	31.3	1.10	3.93
P-B14	1.46	22.7	0.90	3.17
P-B15	1.46	22.7	0.90	3.17
P-B16	3.05	29.3	1.58	5.62
P-B17	3.11	28.2	0.76	2.69
TOTAL (P-B)	**32.64**		**16.68**	**59.21**

REQUIRED STORAGE USING UNIT HYDROGRAPH:

(100 YR-24HR)	Runoff Volume		Remarks
	Drainage Area A to Basin A	Drainage Area B to Basin B	
Pre-Development Condition	85,427 cu.ft.	103,760 cu.ft.	
Post Development Condition	82,606 cu.ft.	244,175 cu.ft.	
DIFFERENCE – PRE vs POST CONDITION	**-2,821 cu.ft.**	**140,415 cu.ft.**	
TOTAL PROVIDED STORAGE RETENTION BASIN – (PER M-WQMP FOR RIO VISTA VILLAGE: 100YR-24HR)	**2.38 Ac-ft 103,673 cu. ft.**	**3.66 Ac-ft 159,430 cu.ft.**	
CAPACITY OF UPGRADED RETENTION BASINS	**168,098 cu. ft.**	**319,748 cu. ft.**	**Adequate**

PRE VS POST DEVELOPMENT CONDITION AFTER RETENTION (100YR-24HR)

PRE-CONSTRUCTION VS POST-CONSTRUCTION FLOW SUMMURY BEFORE AND AFTER RETENTION					
Discharge Location	**Total Pre-Development Flow Rate, Q100**	**Total Post-Development Flow Rate (No Retention), Q100**	**Retention Volume Provided**	**Total Post-Development Flow Rate (After Retention), Q100**	**Conclusion**
Retention Basin A	**13.31 cfs**	**19.05 cfs**	**168,098 cu.ft.**	**3.94 cfs**	**Post development flow decreased.**
Existing Retention B	**13.48 cfs**	**59.21 cfs**	**319,748 cu.ft.**	**7.08 cfs**	**Post development flow decreased.**

SUMMARY OF STORM DRAIN CALCULATIONS (WORST CASE SCENARIO)

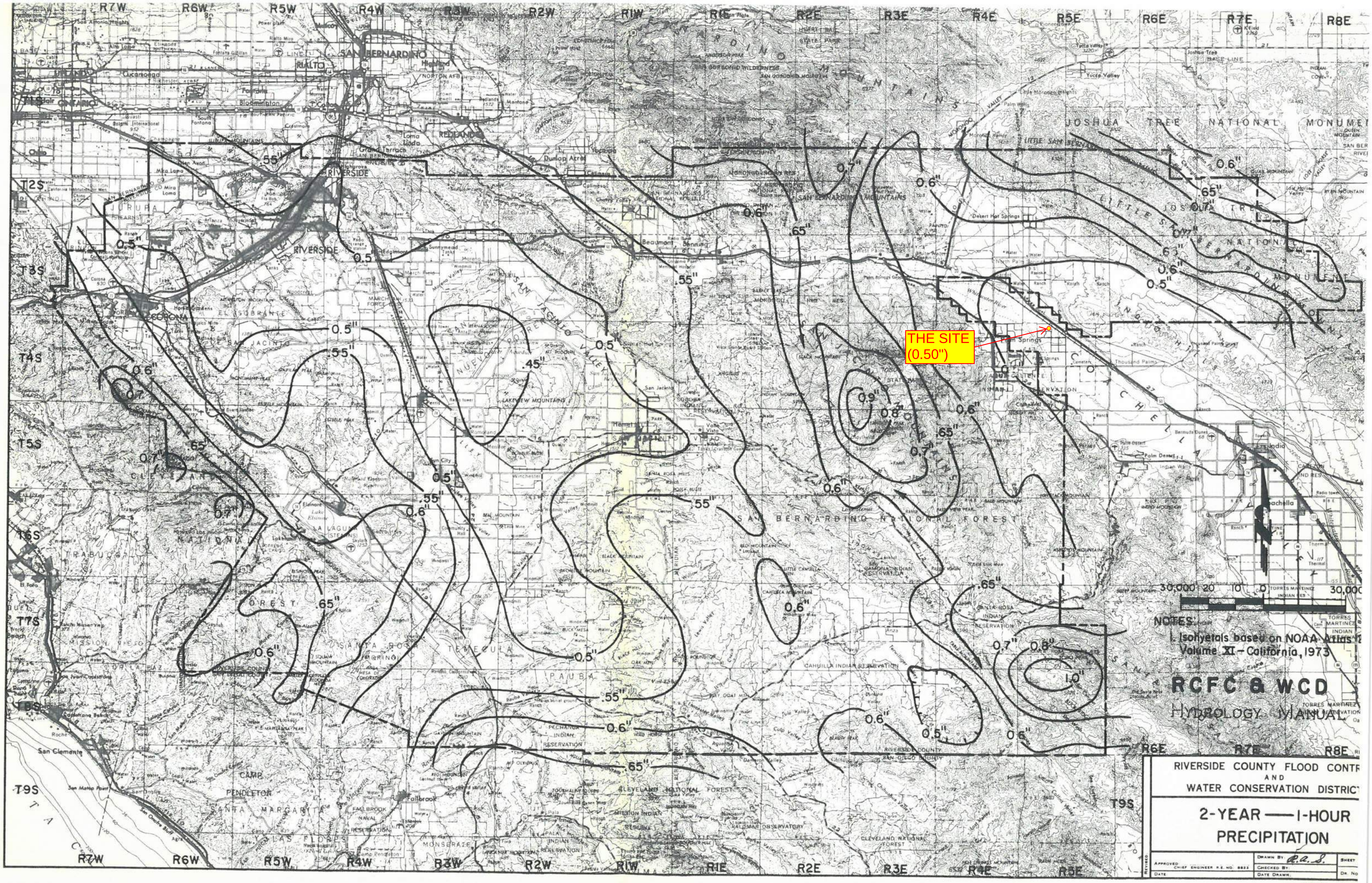
DIAMETER	SLOPE	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)
18-inch SD	S=0.0050	7.23	1.20	4.77
24-inch SD	S=0.0050	14.24	1.47	5.74
30-inch SD	S=0.0050	25.24	1.80	6.65
36-inch SD	S=0.0050	42.31	2.22	7.53
42-inch SD	S=0.0050	56.52	2.35	8.20

6.0 APPENDICES

Appendix 1	*Riverside County Flood Control Hydrology Manual Excepts.*
Appendix 2	*Unit Hydrograph: Pre and Post Development Conditions for 10yr- and 100yr-24Hr*
Appendix 3	*RCFC & WCD Hydrologic Soil Map (Plate C-1.36)*
Appendix 4	*Autodesk CIVIL3D Hydraflow Unit Hydrograph Calculations (STORAGE) 100yr-24Hr*
Appendix 5	*Hydrology Maps-Pre and Post Development Hydrology Map/ SD-Catch Basin Exhibit*
Appendix 6	*Storm Drain Sizing*
Appendix 7	*Excerpts from Approved Master Drainage Report for Tract 28639-1 and M-WQMP - Rio Vista Village (For Reference Only)*
Appendix 8	*Supporting Documents*

APPENDIX 1

RIVERSIDE COUNTY FLOOD CONTROL HYDROLOGY MANUAL EXCEPTS.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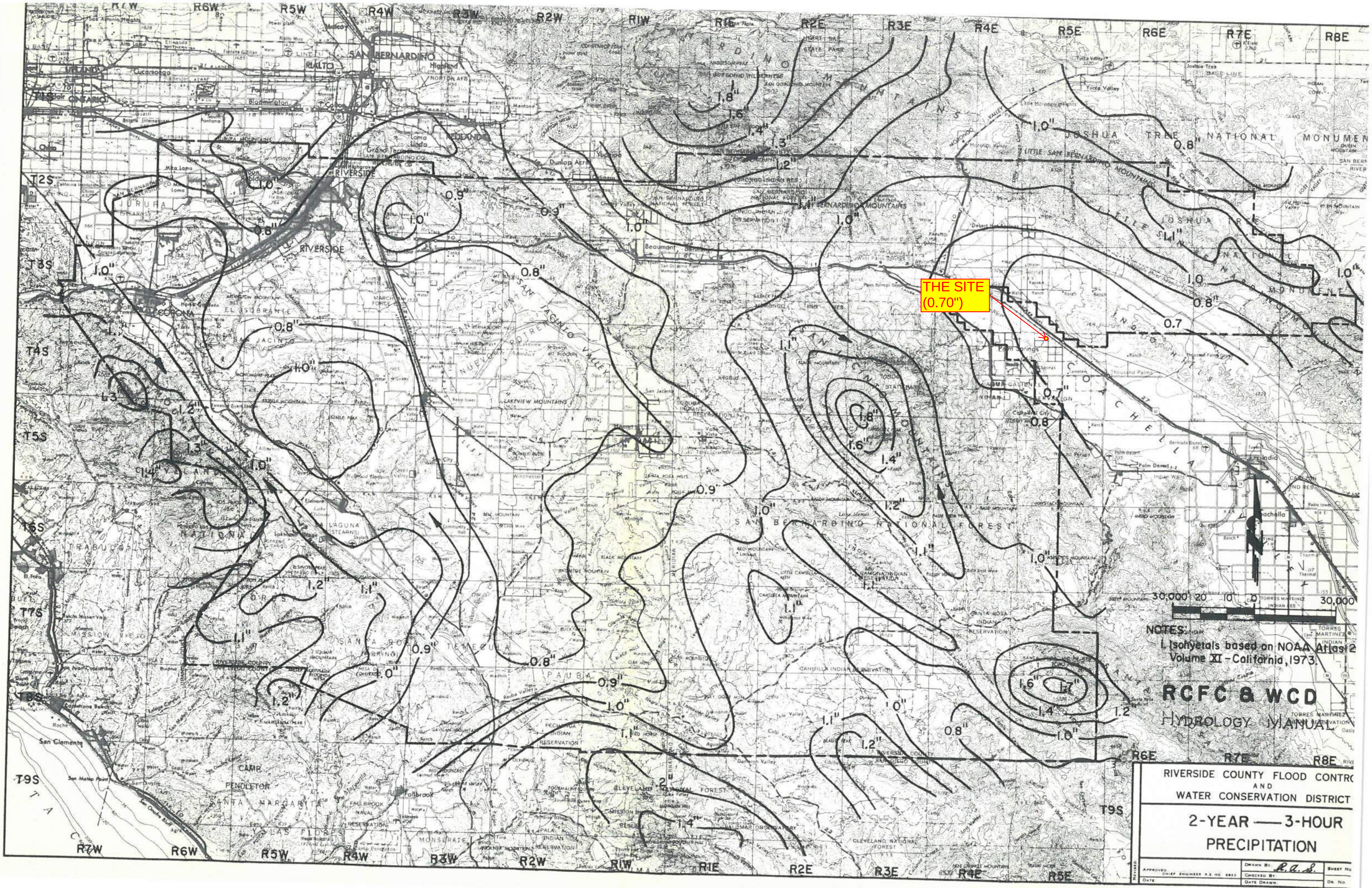
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR PRECIPITATION
30,000 20 10 0 30,000
R7W R6W R5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E
T1S T2S T3S T4S T5S T6S T7S T8S T9S
PLATE D-4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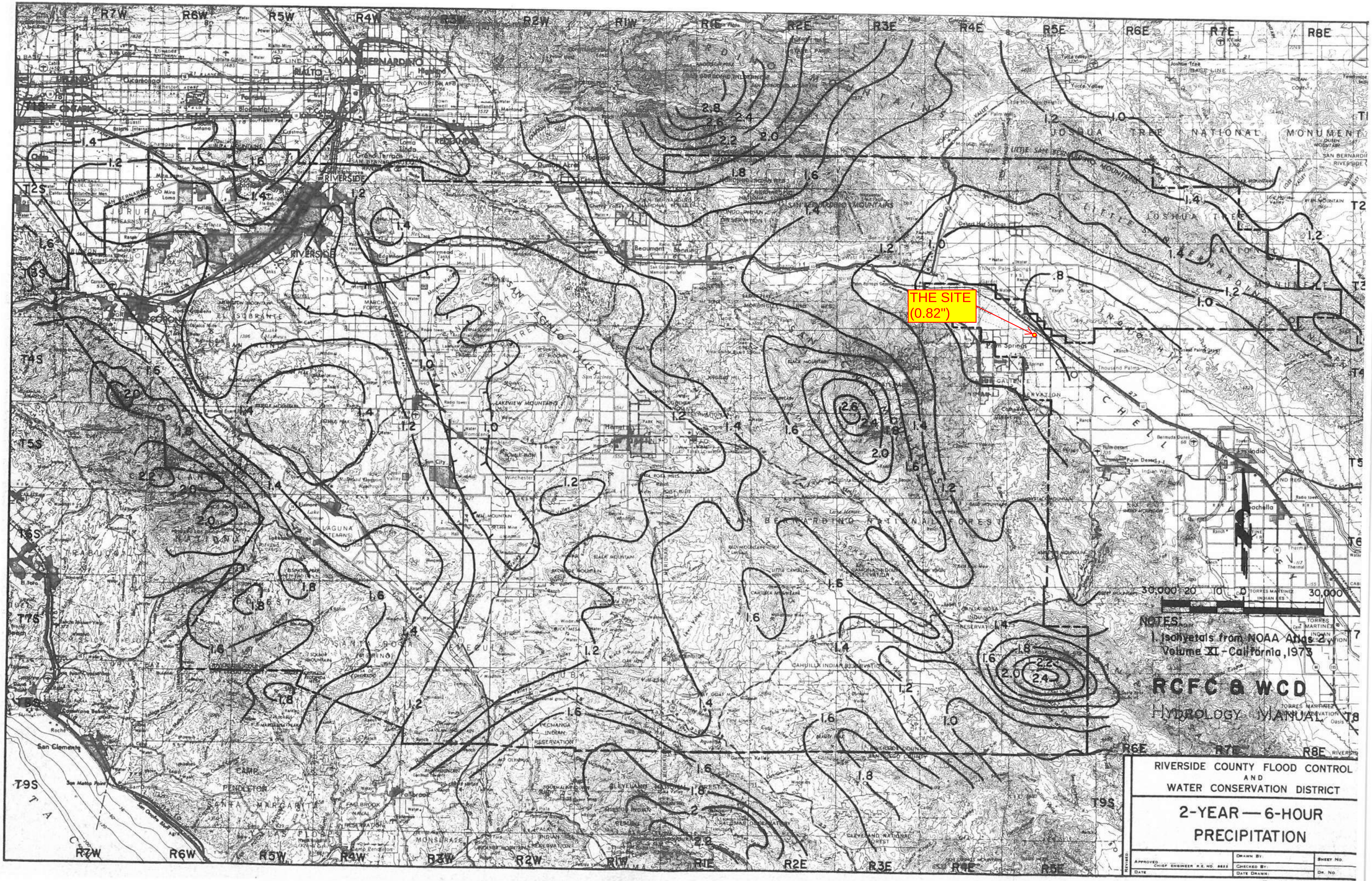
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 3-HOUR
PRECIPITATION

PLATE E-5.1



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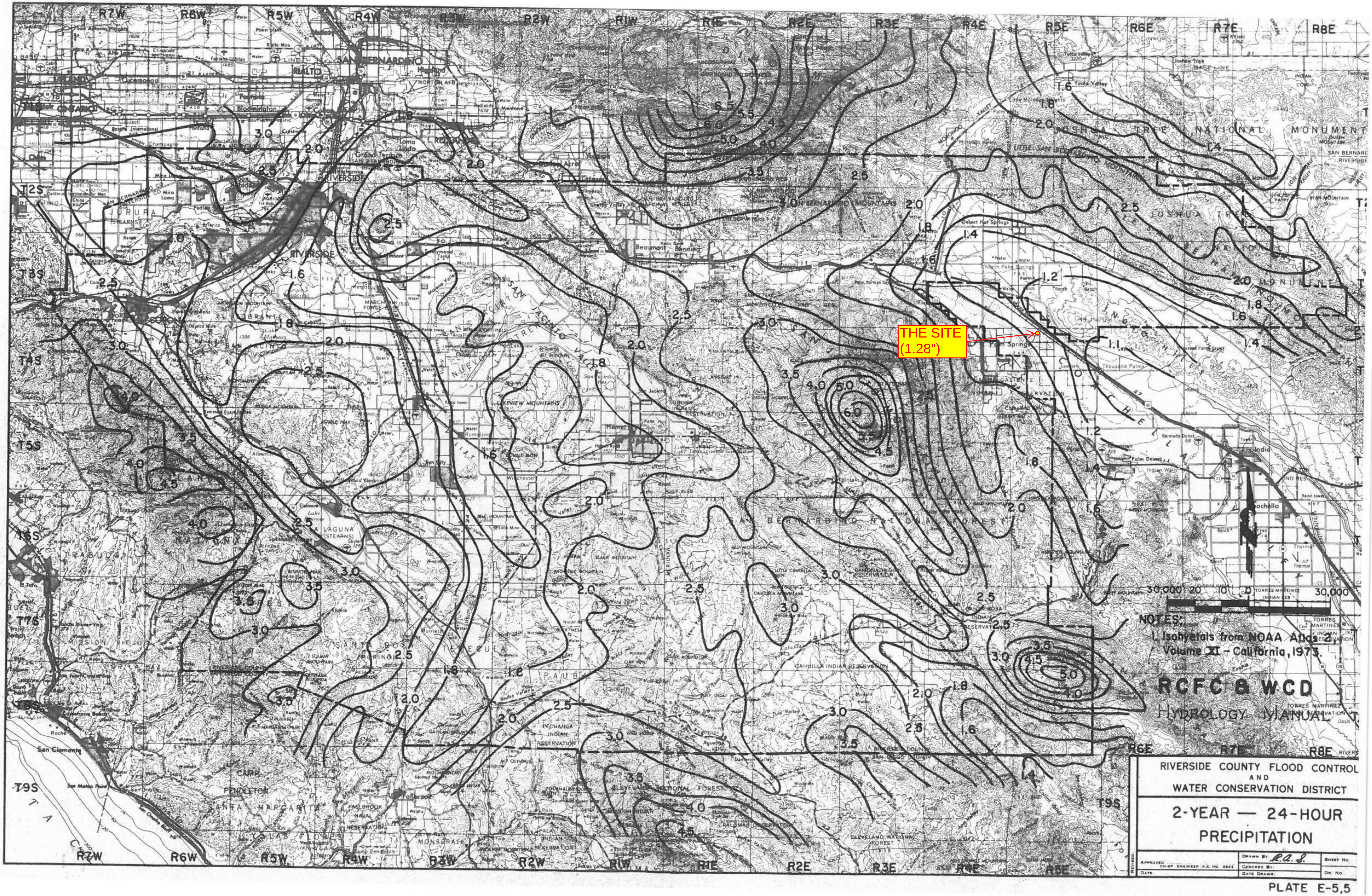
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION

PLATE E-5.3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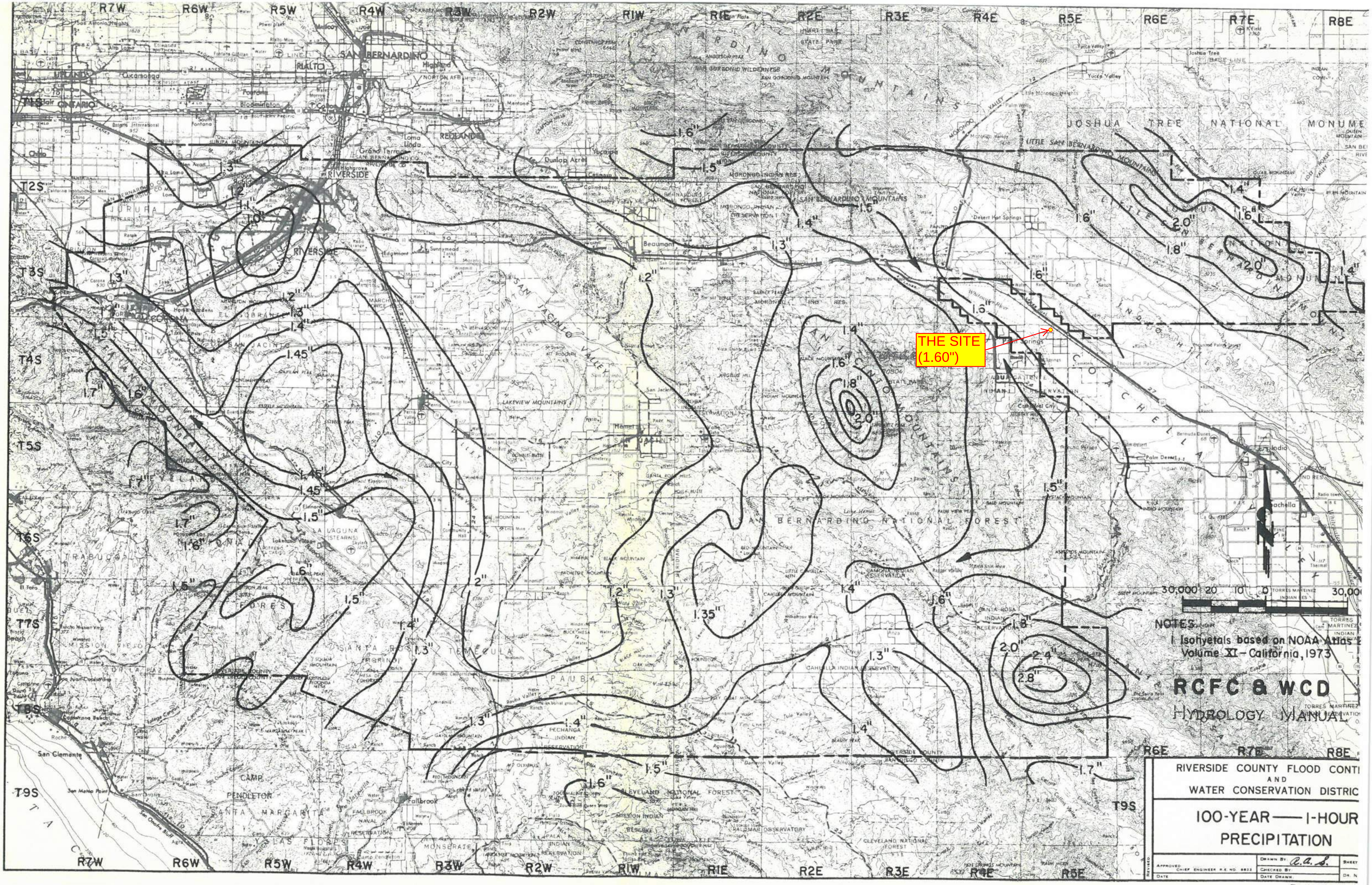
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR
PRECIPITATION
PLATE E-5.5


THE SITE
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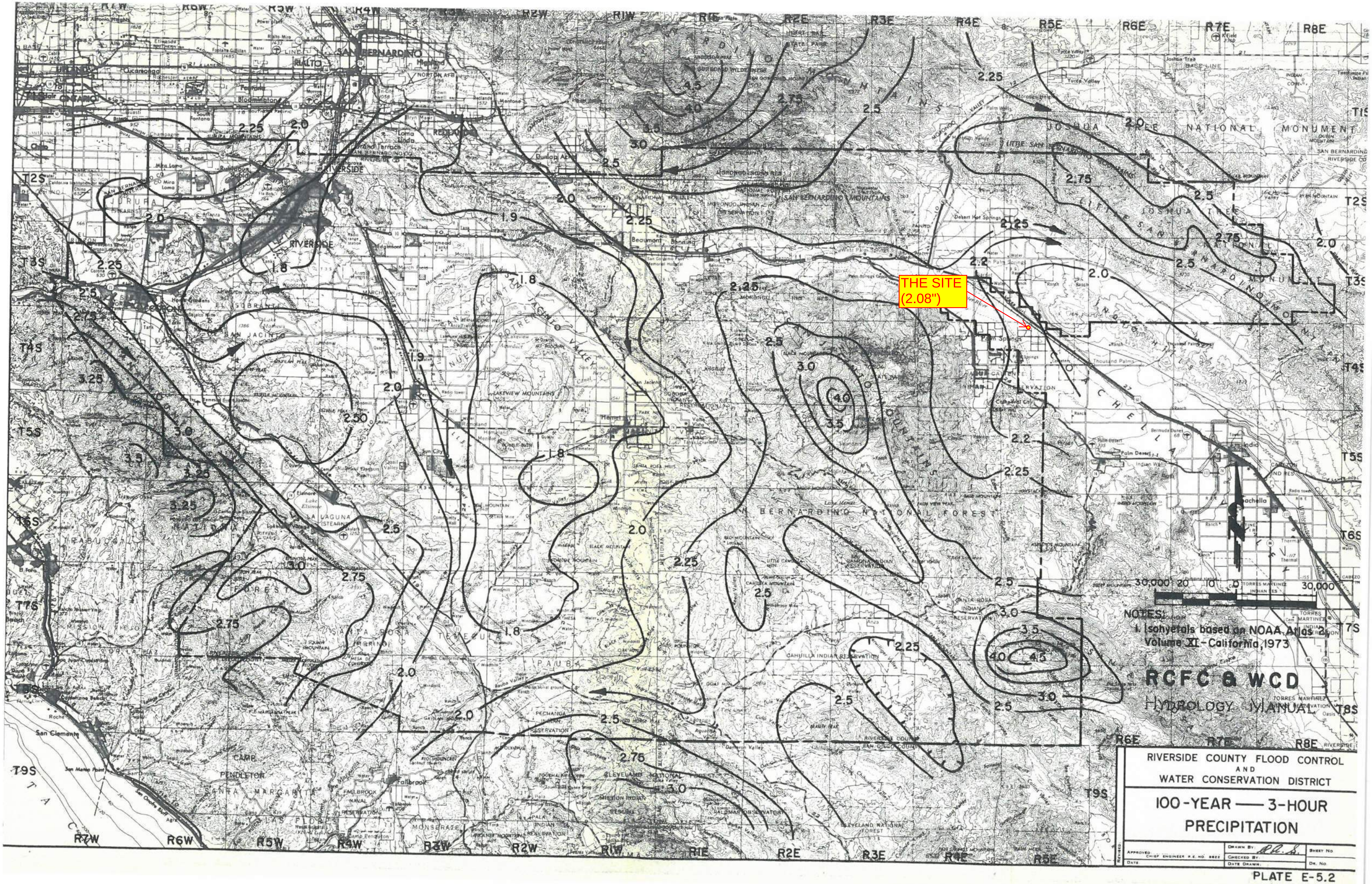
RCFC & WCD
HYDROLOGY MANUAL
NOTES
1. Isohyetals based on NOAA Atlas 2
Volume XI - California, 1973
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
30,000 20 10 0 30,000
SAN BERNARDINO
RIVERSIDE
REDLANDS
JOSHUA TREE NATIONAL MONUMENT
SAN JACINTO MOUNTAINS
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
COACHELLA
TEMECULA
CAMP PENDLETON
R7W R6W R5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E
T1S T2S T3S T4S T5S T6S T7S T8S T9S

PLATE D-4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NOTES:
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.2

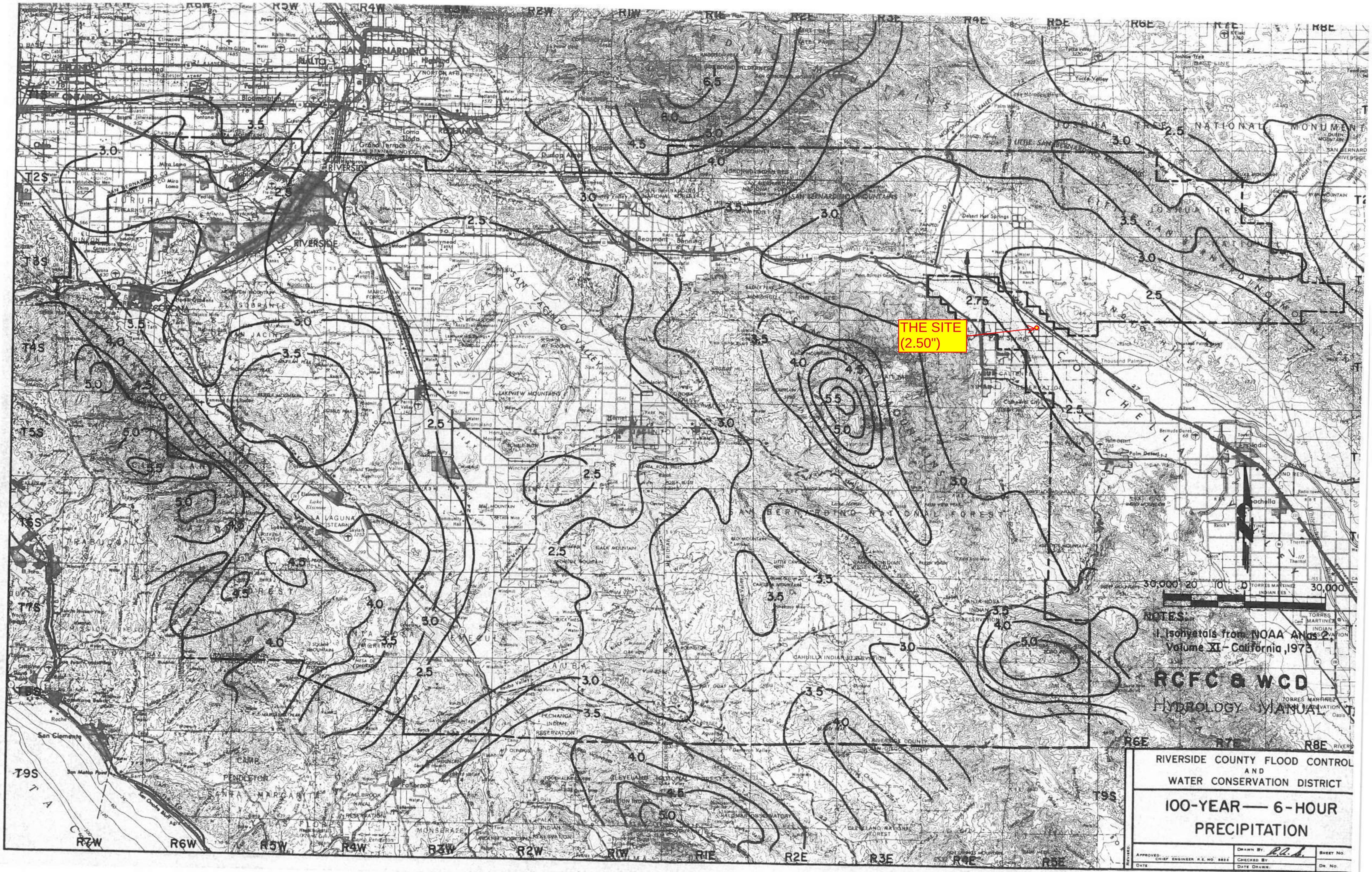

THE SITE
(2.50")
NOTES:
1. Isohyetals from NOAA Atlas 2,
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR
PRECIPITATION
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
COACHELLA
SAN JACINTO VALLEY
SAN BERNARDINO
RIVERSIDE
Palm Springs
Indio
San Clemente

PLATE E-5.4

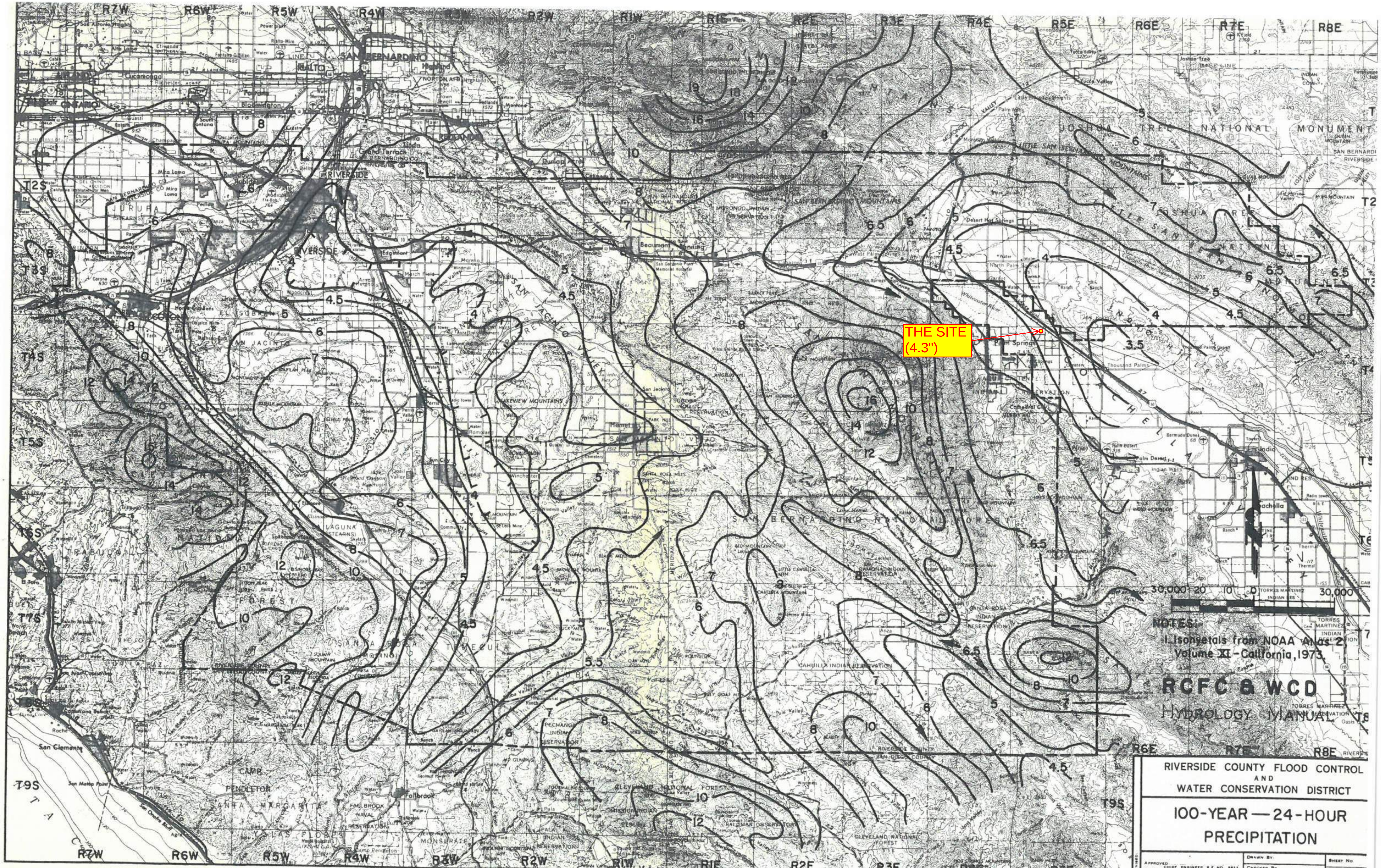
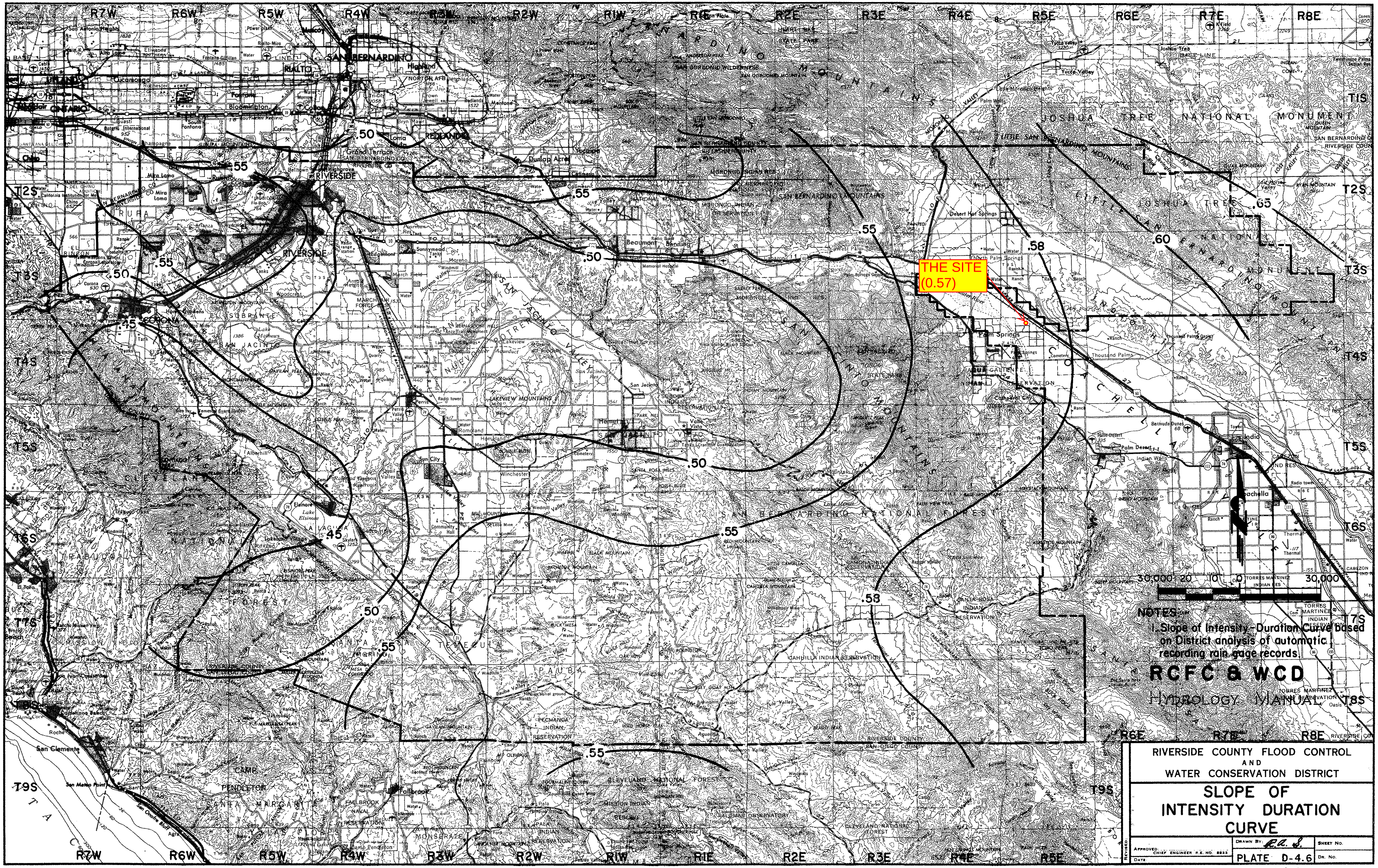
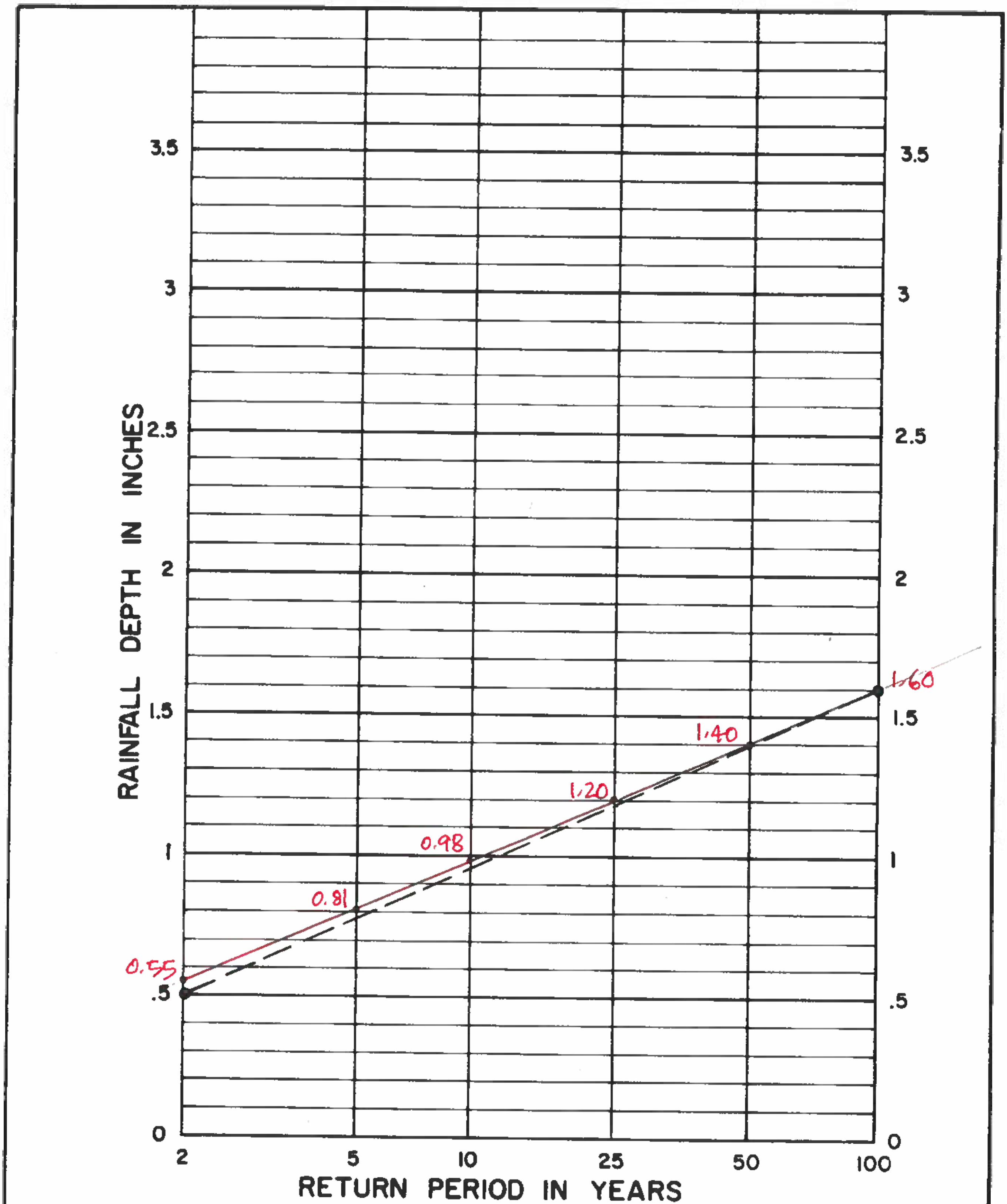

THE SITE
(4.3")
NOTES:
1. Isohyetals from NOAA Atlas 2
Volume XI - California, 1973.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
SAN BERNARDINO
RIVERSIDE
Beaumont
Palm Springs
Hemet
Indio
Coachella
Thousand Palms
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST

PLATE E-5.6


THE SITE
(0.57)
NOTES:
1. Slope of Intensity-Duration Curve based on District analysis of automatic recording rain gage records.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SLOPE OF
INTENSITY DURATION
CURVE
PLATE D-4.6
.45
.50
.55
.58
.60
.65
SAN BERNARDINO
RIVERSIDE
Palm Springs
Desert Hot Springs
Indio
Coachella
Hemet
San Jacinto
Elsinore
San Clemente
Fallbrook
JOSHUA TREE NATIONAL MONUMENT
30,000 20 10 0 30,000



NOTE:

1. For intermediate return periods plot 2-year and 100-year one hour values from maps, then connect points and read value for desired return period. For example given 2-year one hour = .50" and 100-year one hour = 1.60", 25-year one hour = 1.18"

Reference: NOAA Atlas 2, Volume XI - California, 1973.

RCFC & WCD

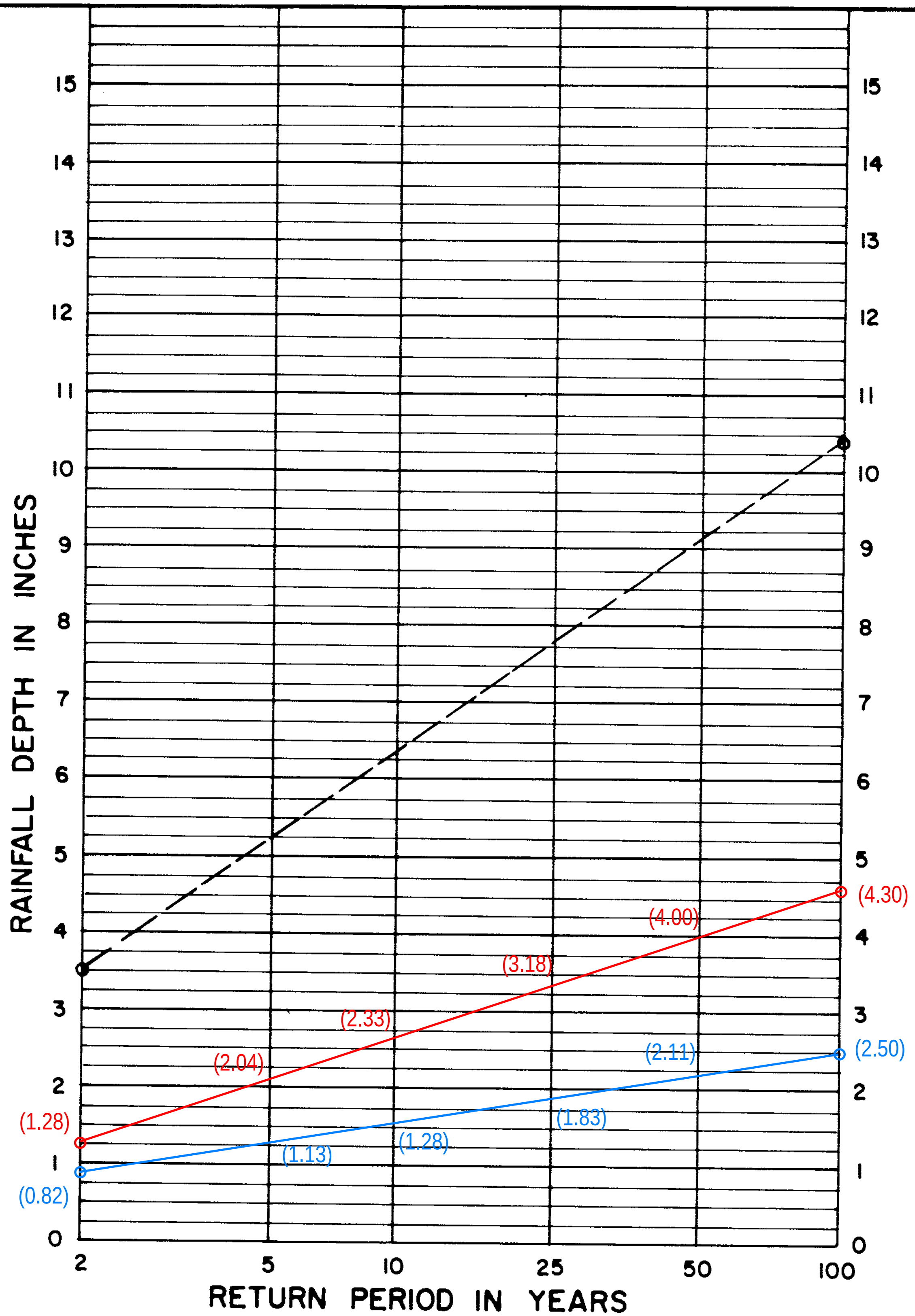
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

VERANO - CATHEDRAL CITY, CA

(ONE HOUR VALUES)

PLATE D-4.5



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA Atlas 2, Volume XI-California, 1973.

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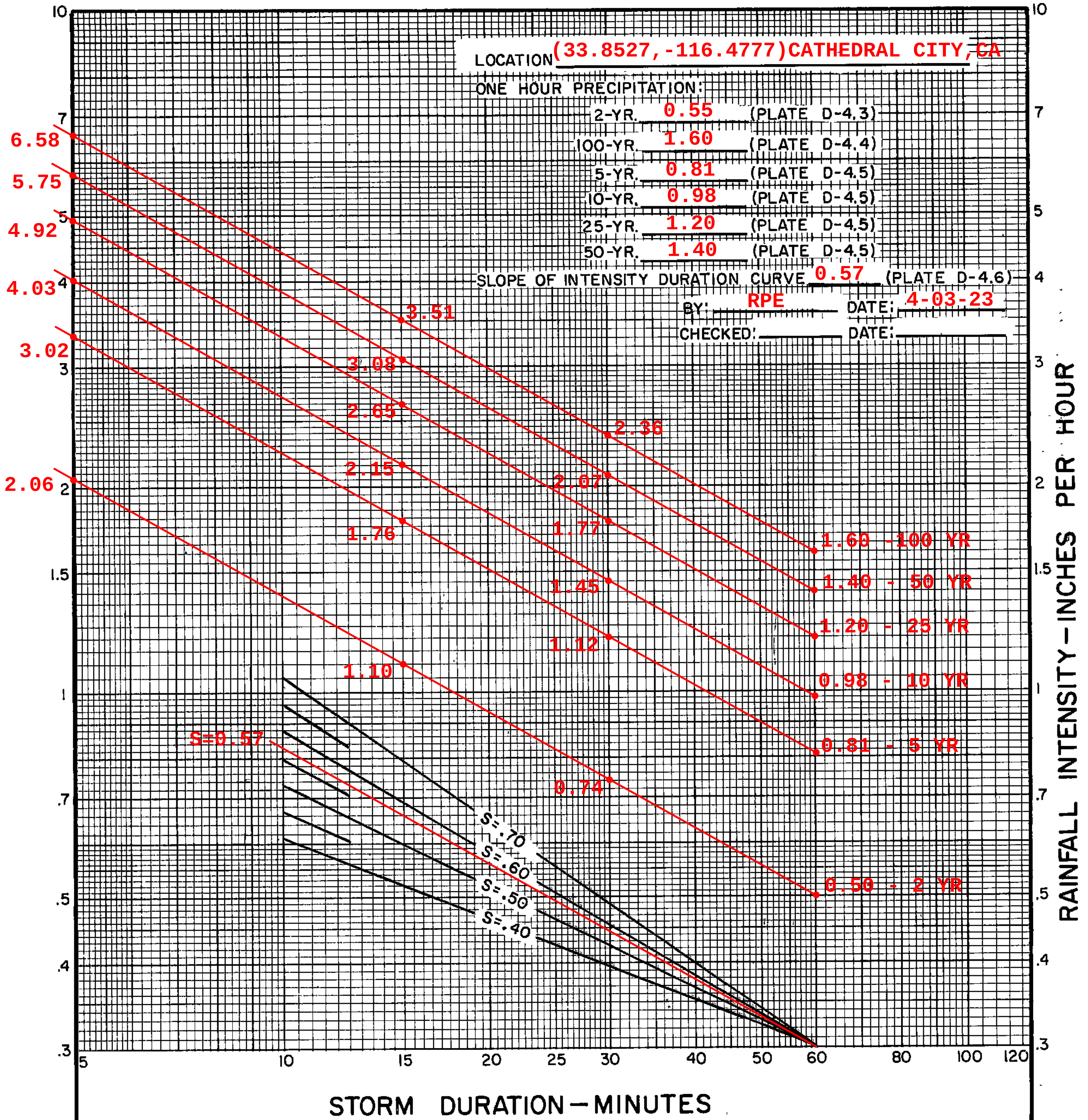
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

VERANO-CATHEDRAL CITY, CA (24-HOUR VALUES)

(6-HOUR VALUES)

PLATE E-5.7



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HYDROLOGY MANUAL

INTENSITY—DURATION CURVES CALCULATION SHEET

PLATE D-4.7

RAINFALL INTENSITY—INCHES PER HOUR

CATHEDRAL CITY			CHERRY VALLEY			CORONA			DESERT HOT SPRINGS			ELSINORE - WILDOMAR		
DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	100 YEAR
5	4.14	6.76	5	3.65	5.49	5	3.10	4.78	5	4.39	6.76	5	3.23	4.94
6	3.73	6.08	6	3.30	4.97	6	2.84	4.38	6	3.95	6.08	6	2.96	4.53
7	3.41	5.56	7	3.03	4.56	7	2.64	4.07	7	3.62	5.56	7	2.75	4.21
8	3.15	5.15	8	2.82	4.24	8	2.47	3.81	8	3.35	5.15	8	2.58	3.95
9	2.95	4.81	9	2.64	3.97	9	2.34	3.60	9	3.13	4.81	9	2.44	3.73
10	2.77	4.52	10	2.49	3.75	10	2.22	3.43	10	2.94	4.52	10	2.32	3.54
11	2.62	4.28	11	2.36	3.56	11	2.12	3.27	11	2.78	4.28	11	2.21	3.39
12	2.49	4.07	12	2.25	3.39	12	2.04	3.14	12	2.65	4.07	12	2.12	3.25
13	2.38	3.88	13	2.16	3.25	13	1.96	3.02	13	2.53	3.88	13	2.04	3.13
14	2.28	3.72	14	2.07	3.12	14	1.89	2.92	14	2.42	3.72	14	1.97	3.02
15	2.19	3.58	15	1.99	3.00	15	1.83	2.82	15	2.32	3.58	15	1.91	2.92
16	2.11	3.44	16	1.92	2.90	16	1.77	2.73	16	2.24	3.44	16	1.85	2.83
17	2.04	3.32	17	1.86	2.80	17	1.72	2.66	17	2.16	3.32	17	1.80	2.75
18	1.97	3.22	18	1.80	2.71	18	1.68	2.58	18	2.09	3.22	18	1.75	2.67
19	1.91	3.12	19	1.75	2.64	19	1.63	2.52	19	2.03	3.12	19	1.70	2.60
20	1.85	3.03	20	1.70	2.56	20	1.59	2.46	20	1.97	3.03	20	1.66	2.54
22	1.75	2.86	22	1.61	2.43	22	1.52	2.35	22	1.86	2.86	22	1.59	2.43
24	1.67	2.72	24	1.54	2.32	24	1.46	2.25	24	1.77	2.72	24	1.52	2.33
26	1.59	2.60	26	1.47	2.22	26	1.40	2.17	26	1.69	2.60	26	1.46	2.24
28	1.52	2.49	28	1.41	2.13	28	1.36	2.09	28	1.62	2.49	28	1.41	2.16
30	1.46	2.39	30	1.36	2.05	30	1.31	2.02	30	1.55	2.39	30	1.37	2.09
32	1.41	2.30	32	1.31	1.98	32	1.27	1.96	32	1.50	2.30	32	1.33	2.03
34	1.36	2.22	34	1.27	1.91	34	1.23	1.90	34	1.45	2.22	34	1.29	1.97
36	1.32	2.15	36	1.23	1.85	36	1.20	1.85	36	1.40	2.15	36	1.25	1.92
38	1.28	2.09	38	1.20	1.80	38	1.17	1.81	38	1.36	2.09	38	1.22	1.87
40	1.24	2.02	40	1.16	1.75	40	1.14	1.76	40	1.32	2.02	40	1.19	1.82
45	1.16	1.89	45	1.09	1.64	45	1.08	1.66	45	1.23	1.89	45	1.13	1.72
50	1.09	1.78	50	1.03	1.55	50	1.03	1.58	50	1.16	1.78	50	1.07	1.64
55	1.03	1.68	55	.99	1.47	55	.98	1.51	55	1.09	1.68	55	1.02	1.56
60	.98	1.60	60	.93	1.40	60	.94	1.45	60	1.04	1.60	60	.98	1.50
65	.94	1.53	65	.89	1.34	65	.90	1.40	65	.99	1.53	65	.94	1.44
70	.90	1.46	70	.85	1.29	70	.87	1.35	70	.95	1.46	70	.91	1.39
75	.86	1.41	75	.82	1.24	75	.84	1.30	75	.91	1.41	75	.88	1.35
80	.83	1.35	80	.79	1.20	80	.82	1.26	80	.88	1.35	80	.85	1.31
85	.80	1.31	85	.77	1.16	85	.80	1.23	85	.85	1.31	85	.83	1.27
SLOPE = .580			SLOPE = .550			SLOPE = .480			SLOPE = .580			SLOPE = .480		

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

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HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD

HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

Local land use authority	Ordinance	Requirement
Coachella	Ordinance #1014 Municipal Code Section 13.16.110	To minimize the discharge and transport of pollutants, the city requires all new development and redevelopment projects identified as a Priority Project under the newly implemented NPDES permit No. CAS617002 to retain 100% of the stormwater from the 100 year, 24-hour duration storm in order to prevent any deterioration of the water quality which would impair the subsequent or competing uses of water. Projects that retain and infiltrate 100% of the rainfall conditions specified in Section F.1.c.v.4 of the NPDES permit are deemed to comply with the Treatment Control BMP requirements found in that section of the NPDES permit. The NPDES permit establishes acceptable methods and standards for controlling stormwater runoff volumes, rates, and pollutant loading including but not limited to the following: A. Increase Permeable Areas, Avoid placing impervious surfaces in highly porous soil areas; incorporate landscaping and open space into the project design; use porous materials for or near driveways and walkways; incorporate retention basins that can infiltrate Stormwater onsite; and avoid placing pavement and other impervious surfaces in low lying areas. B. Direct Runoff to Permeable Areas. Direct Stormwater runoff away from impermeable areas to swales, berms, green strip filters, gravel beds, and French drains; install rain gutters and orient them toward permeable areas; modify the grade of the property to divert flow to permeable areas and minimize the amount of stormwater runoff leaving the property and when designing curbs, berms and other structures, avoid designs which isolate permeable or landscaped areas. C. Maximize Stormwater Storage for Reuse. Use retention structures, surface areas, cisterns, or other structures to store stormwater
Cathedral City	Municipal Code – Title 8 § 8.24.070	A. Except as noted below, development of all land within the city must include provisions for the management of stormwater runoff from the property which is to be developed. This management shall consist of constructing stormwater storage facilities, which includes detention basins. As a minimum, all development will make provisions to store runoff from rainfall events up to and including the one-hundred-year, three-hour duration event. If a suitable outlet for a detention basin is not available, or if engineering analysis indicates that available outlet systems would be overtaxed by detention basin outflow, a retention basin shall be constructed in lieu of a detention basin. B. The requirement for construction of a detention basin or a retention basin may be waived in the following cases: 1. The runoff has been included in a storage facility at another location. This may include storage facilities proposed as part of the Cathedral City Storm Drain Master Plan; 2. An application for a building permit to construct a single-family residential structure; 3. Development which will drain directly into a floodway or watercourse drainage channel which has been determined by the project review manager, using engineering analyses provided by the development, to have the capacity and be constructed to handle the additional runoff flow without increasing the potential for flood damage on any other downstream property. 4. Development of a parcel under one-half acre in an area where it can be demonstrated by engineering analyses that no significant increase in the potential for flood damage will be created by the development.

APPENDIX 2

UNIT HYDROGRAPH: PRE AND POST DEVELOPMENT CONDITIONS, 10YR- AND 100YR-24HR

UNIT HYDROGRAPH
PRE-DEVELOPMENT 10YR- AND 100YR-24HR

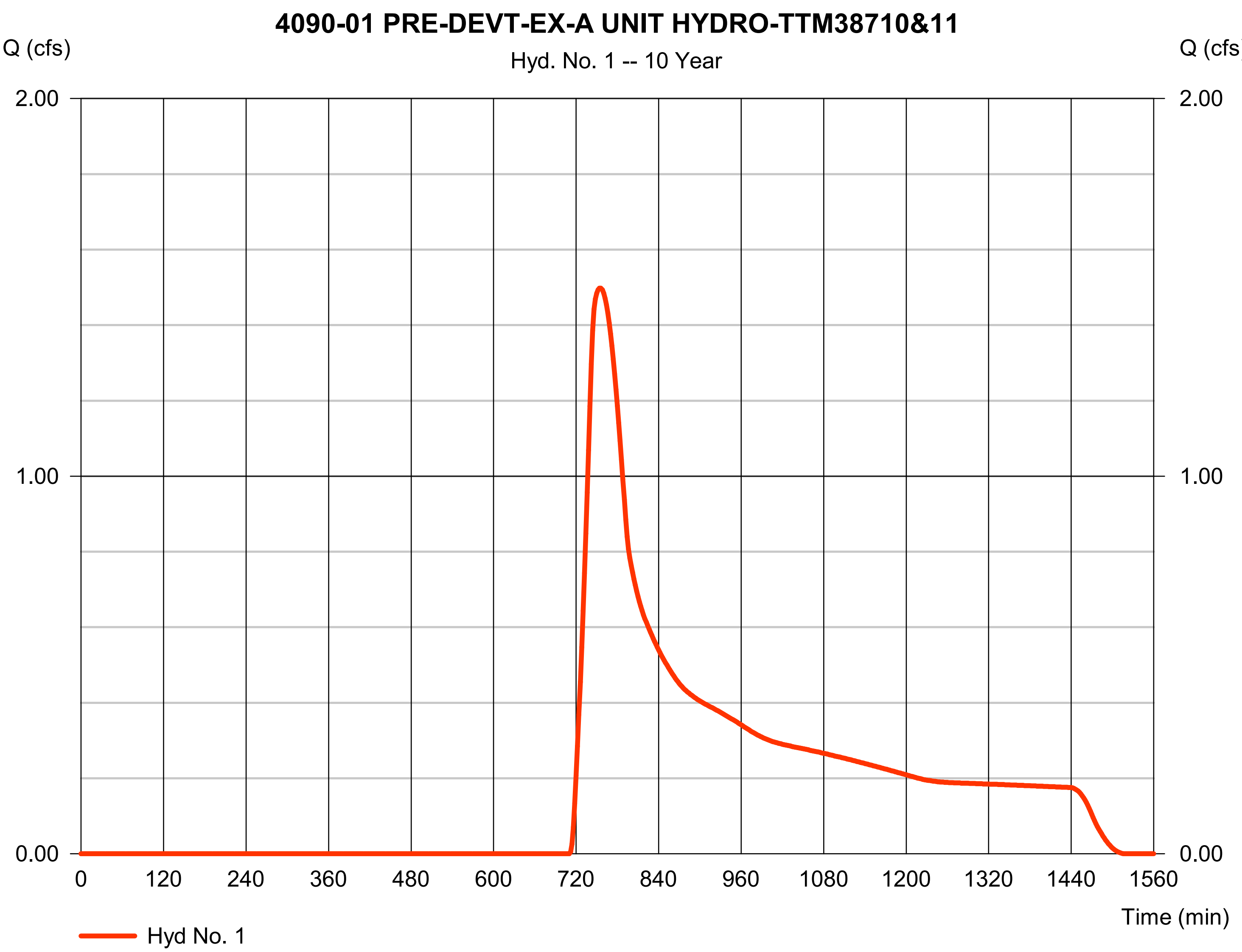
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 1

4090-01 PRE-DEVT-EX-A UNIT HYDRO-TTM38710&11

Hydrograph type	= SCS Runoff	Peak discharge	= 1.498 cfs
Storm frequency	= 10 yrs	Time to peak	= 754 min
Time interval	= 2 min	Hyd. volume	= 16,741 cuft
Drainage area	= 19.500 ac	Curve number	= 65
Basin Slope	= 1.8 %	Hydraulic length	= 1440 ft
Tc method	= LAG	Time of conc. (Tc)	= 48.80 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



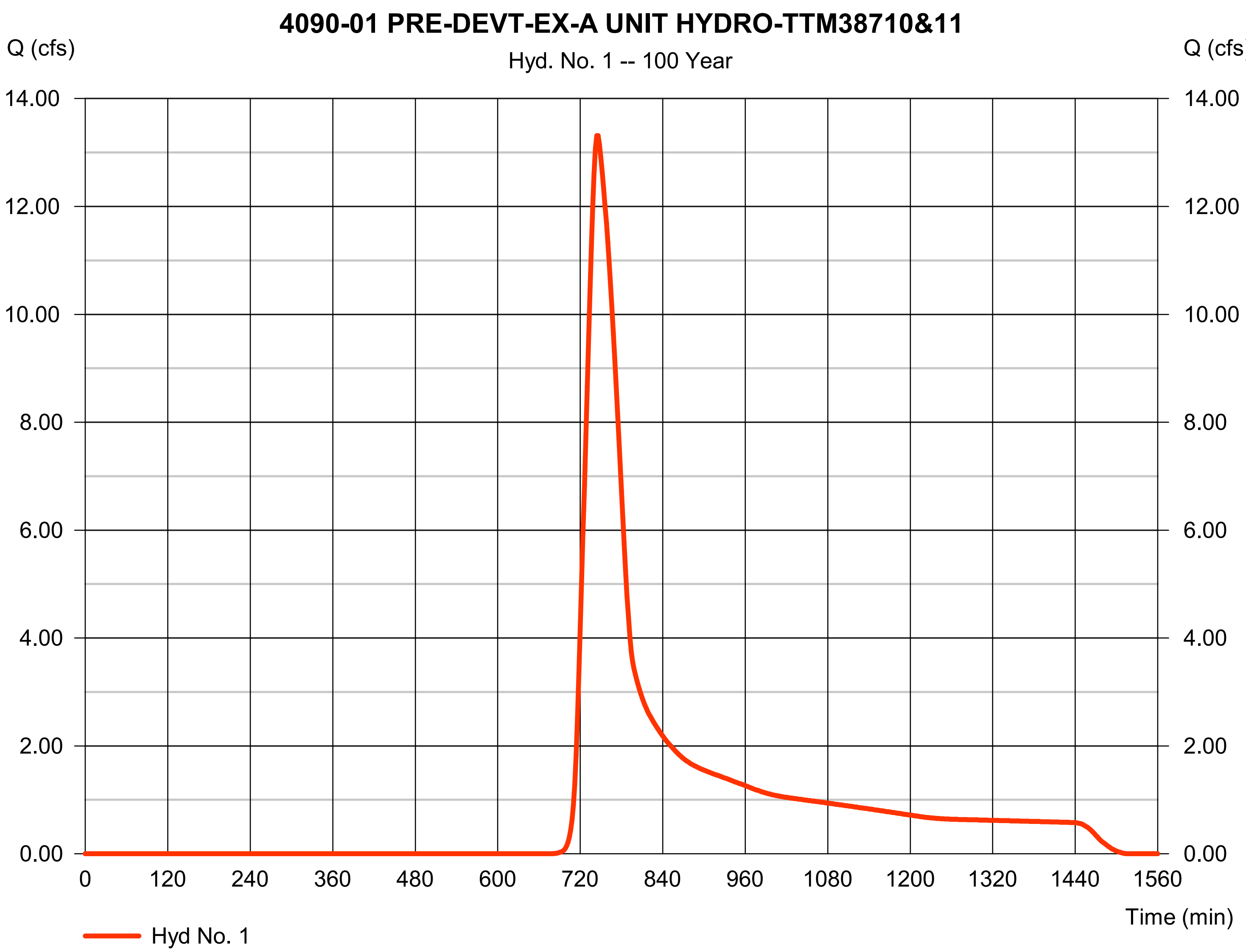
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 1

4090-01 PRE-DEVT-EX-A UNIT HYDRO-TTM38710&11

Hydrograph type	= SCS Runoff	Peak discharge	= 13.31 cfs
Storm frequency	= 100 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 85,427 cuft
Drainage area	= 19.500 ac	Curve number	= 65
Basin Slope	= 1.8 %	Hydraulic length	= 1440 ft
Tc method	= LAG	Time of conc. (Tc)	= 48.80 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

ne: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

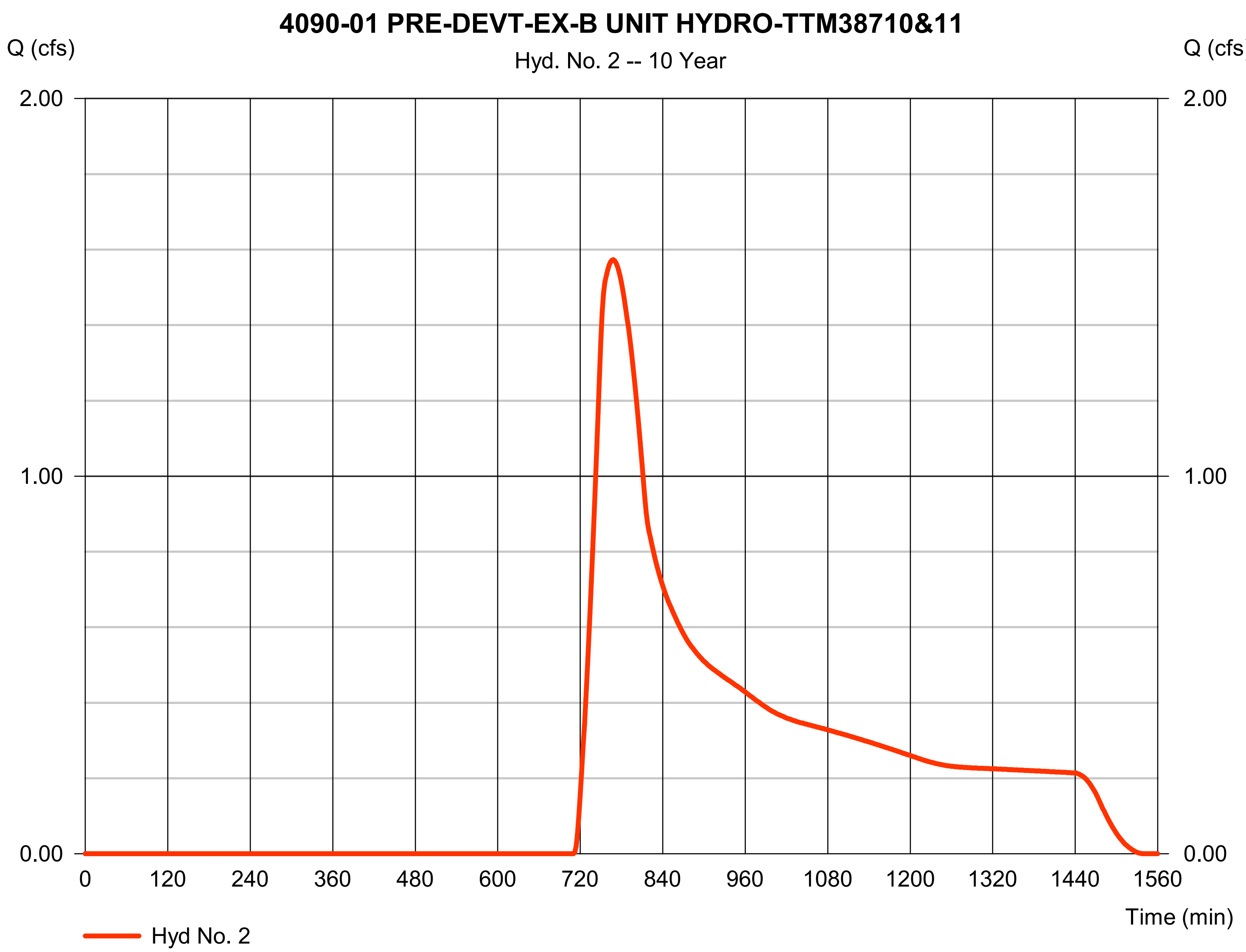
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 2

4090-01 PRE-DEVT-EX-B UNIT HYDRO-TTM38710&11

Hydrograph type	= SCS Runoff	Peak discharge	= 1.573 cfs
Storm frequency	= 10 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 20,334 cuft
Drainage area	= 23.530 ac	Curve number	= 65
Basin Slope	= 1.7 %	Hydraulic length	= 1892 ft
Tc method	= LAG	Time of conc. (Tc)	= 61.23 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



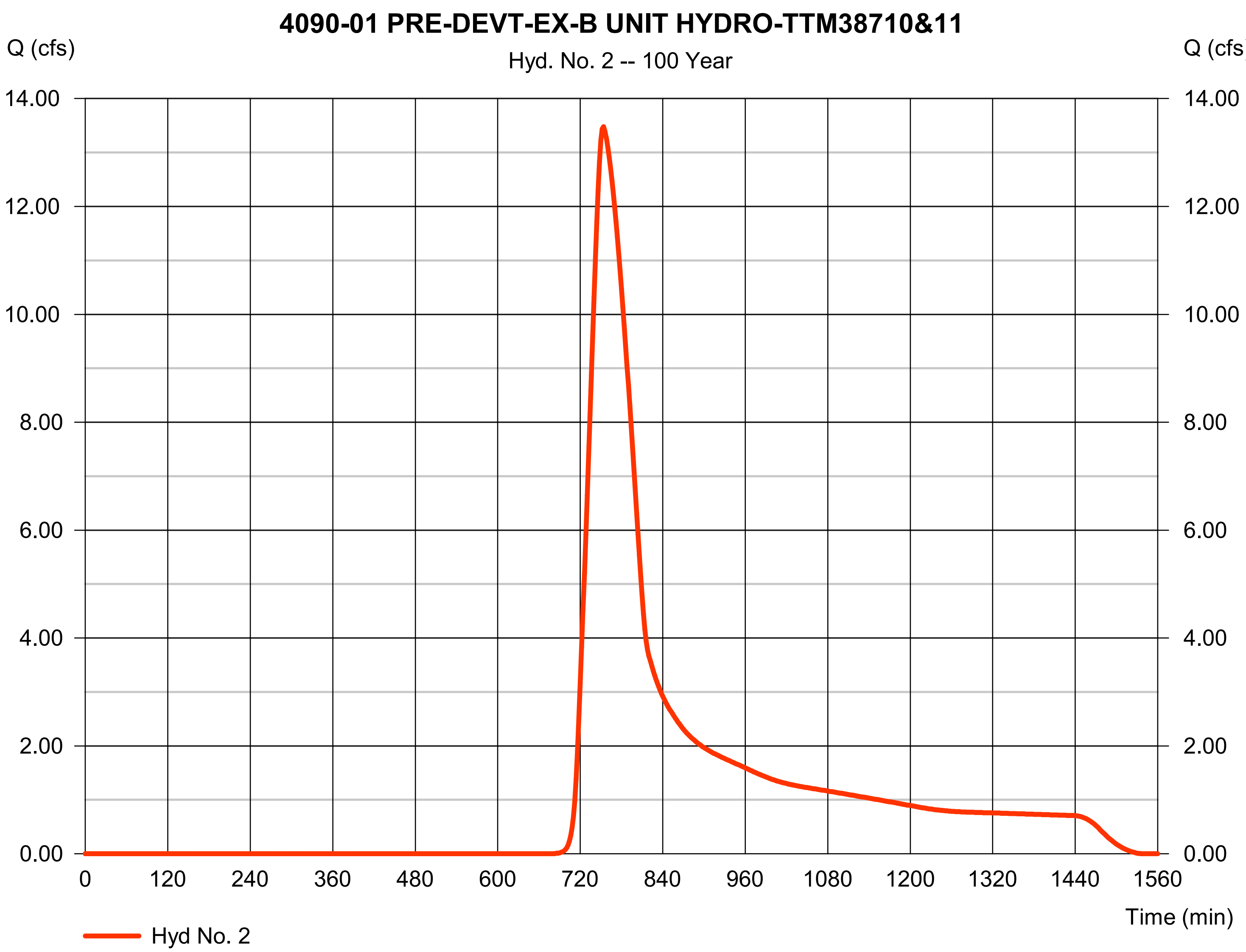
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 2

4090-01 PRE-DEVT-EX-B UNIT HYDRO-TTM38710&11

Hydrograph type	= SCS Runoff	Peak discharge	= 13.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 754 min
Time interval	= 2 min	Hyd. volume	= 103,760 cuft
Drainage area	= 23.530 ac	Curve number	= 65
Basin Slope	= 1.7 %	Hydraulic length	= 1892 ft
Tc method	= LAG	Time of conc. (Tc)	= 61.23 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

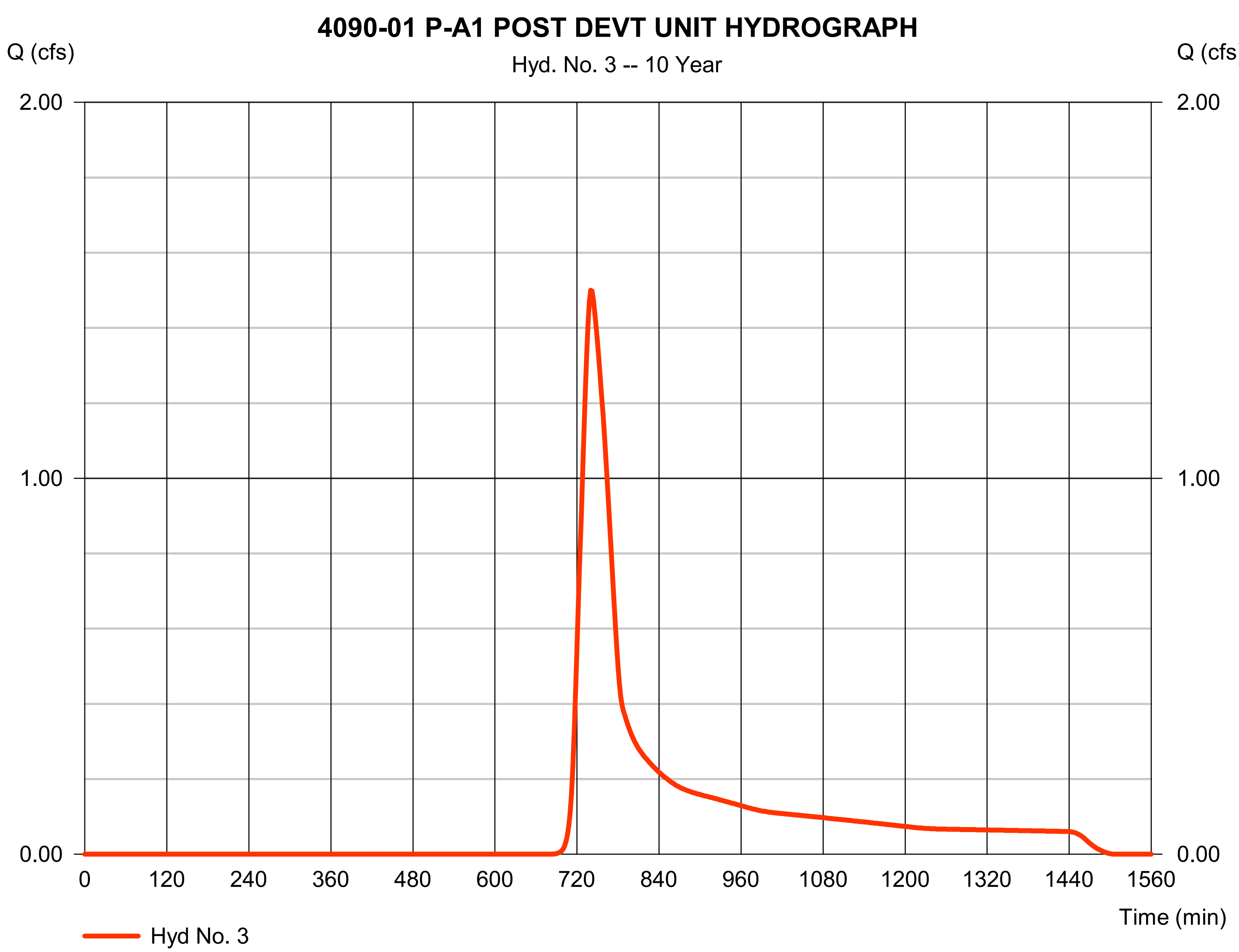
UNIT HYDROGRAPH
POST-DEVELOPMENT 10YR- AND 100YR-24HR

Hydrograph Report

Hyd. No. 3

4090-01 P-A1 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.500 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 8,811 cuft
Drainage area	= 3.780 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 1287 ft
Tc method	= LAG	Time of conc. (Tc)	= 41.85 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



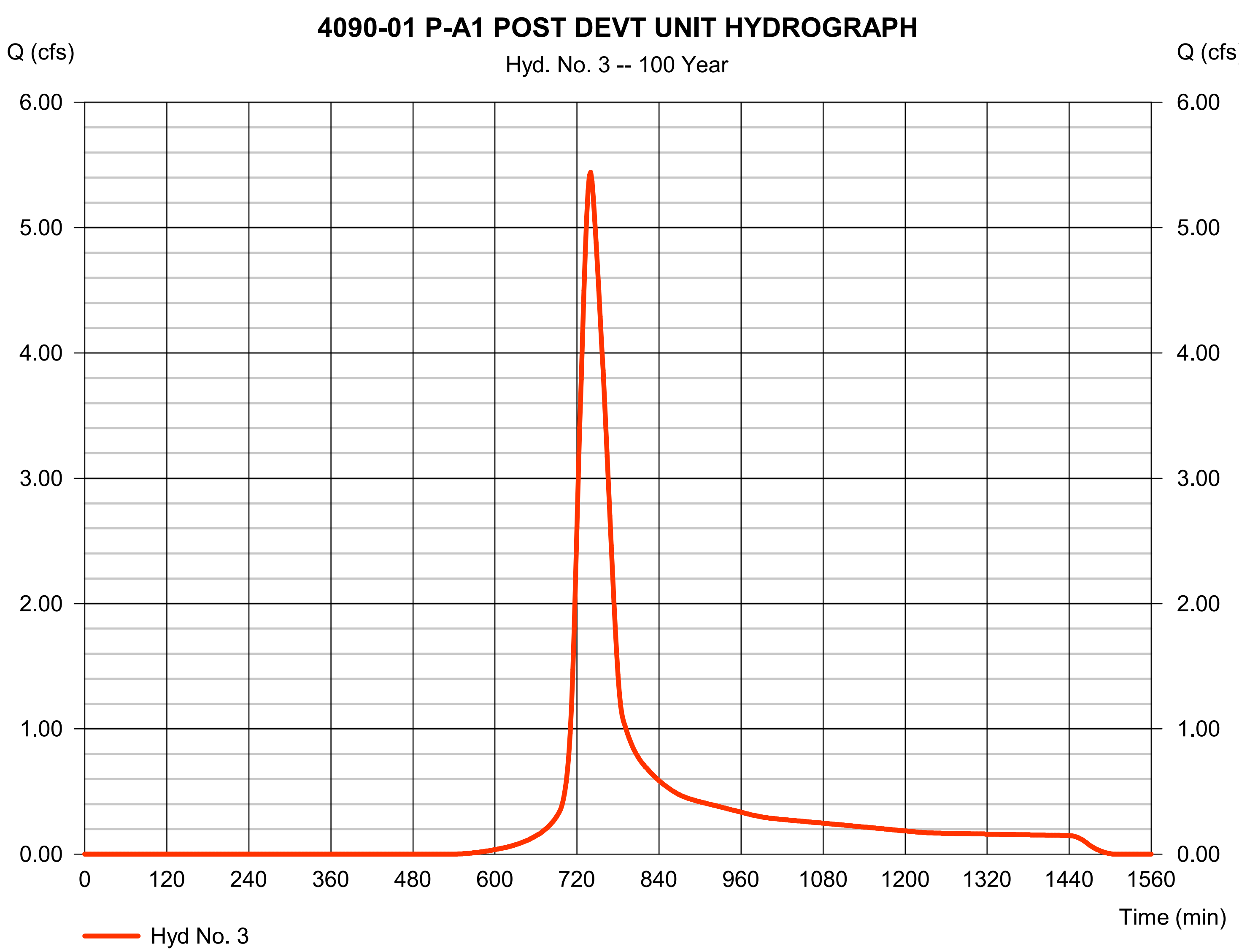
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 3

4090-01 P-A1 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 5.442 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 28,390 cuft
Drainage area	= 3.780 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 1287 ft
Tc method	= LAG	Time of conc. (Tc)	= 41.85 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

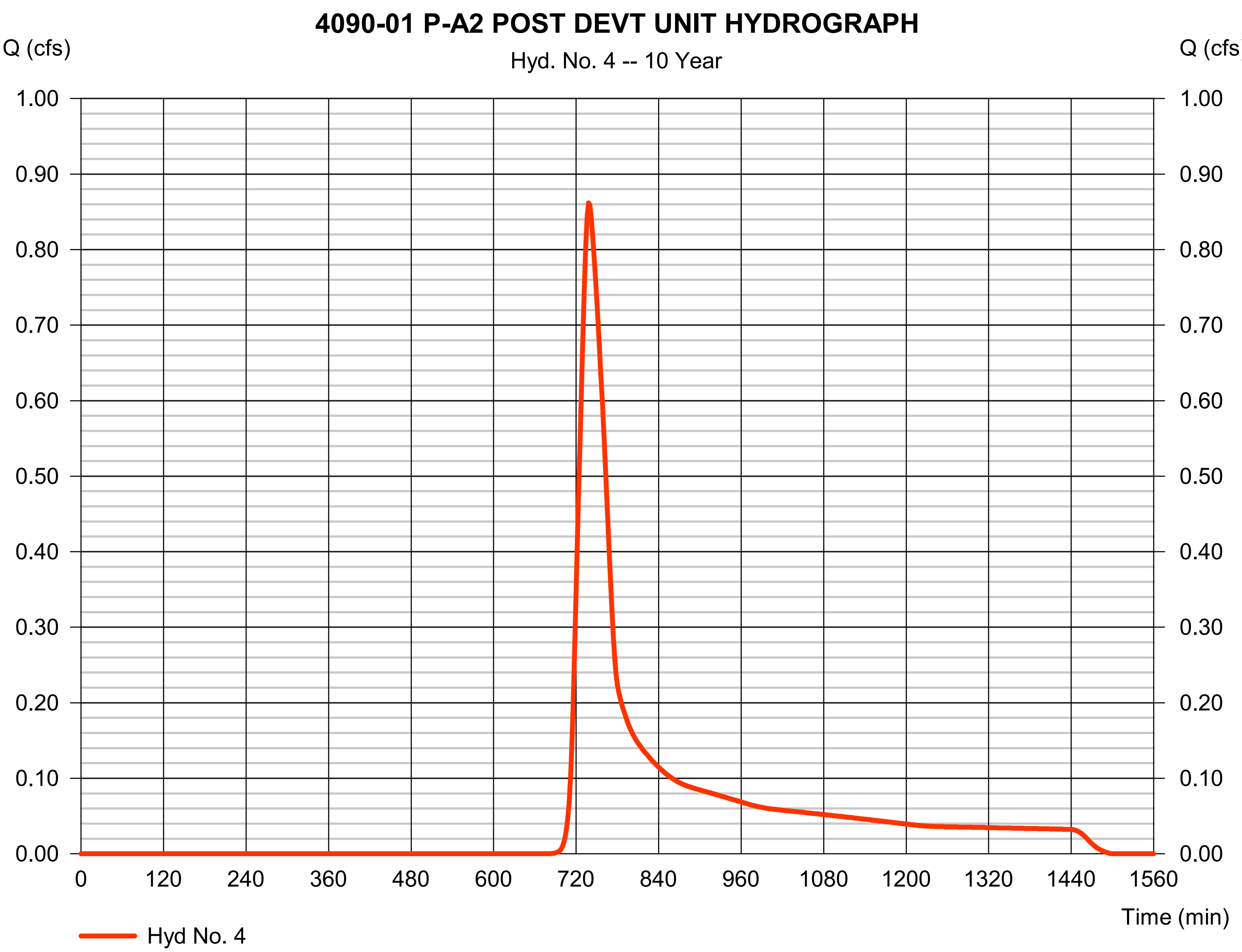
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 4

4090-01 P-A2 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.862 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 4,733 cuft
Drainage area	= 2.050 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 1167 ft
Tc method	= LAG	Time of conc. (Tc)	= 38.70 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



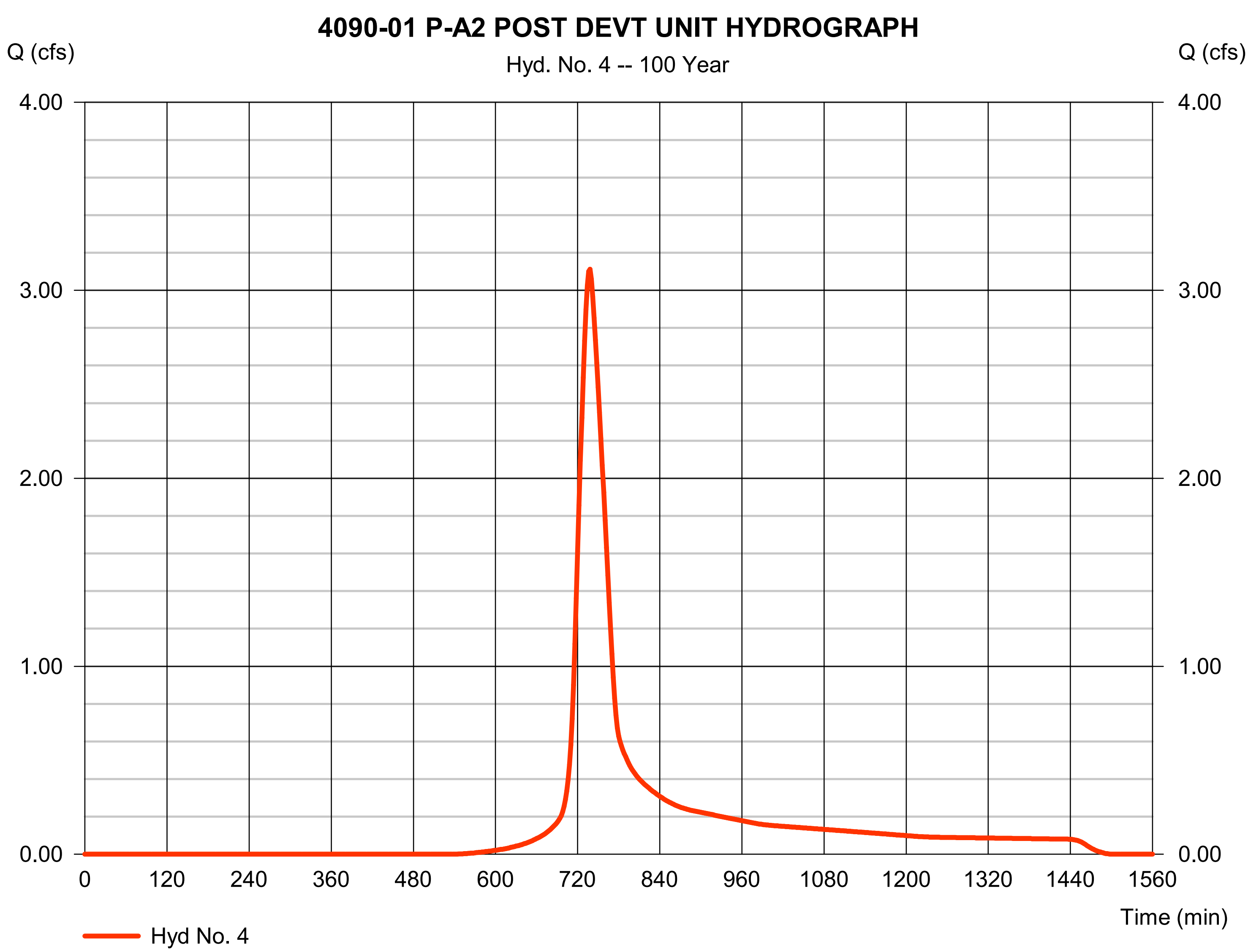
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 4

4090-01 P-A2 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.112 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 15,250 cuft
Drainage area	= 2.050 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 1167 ft
Tc method	= LAG	Time of conc. (Tc)	= 38.70 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

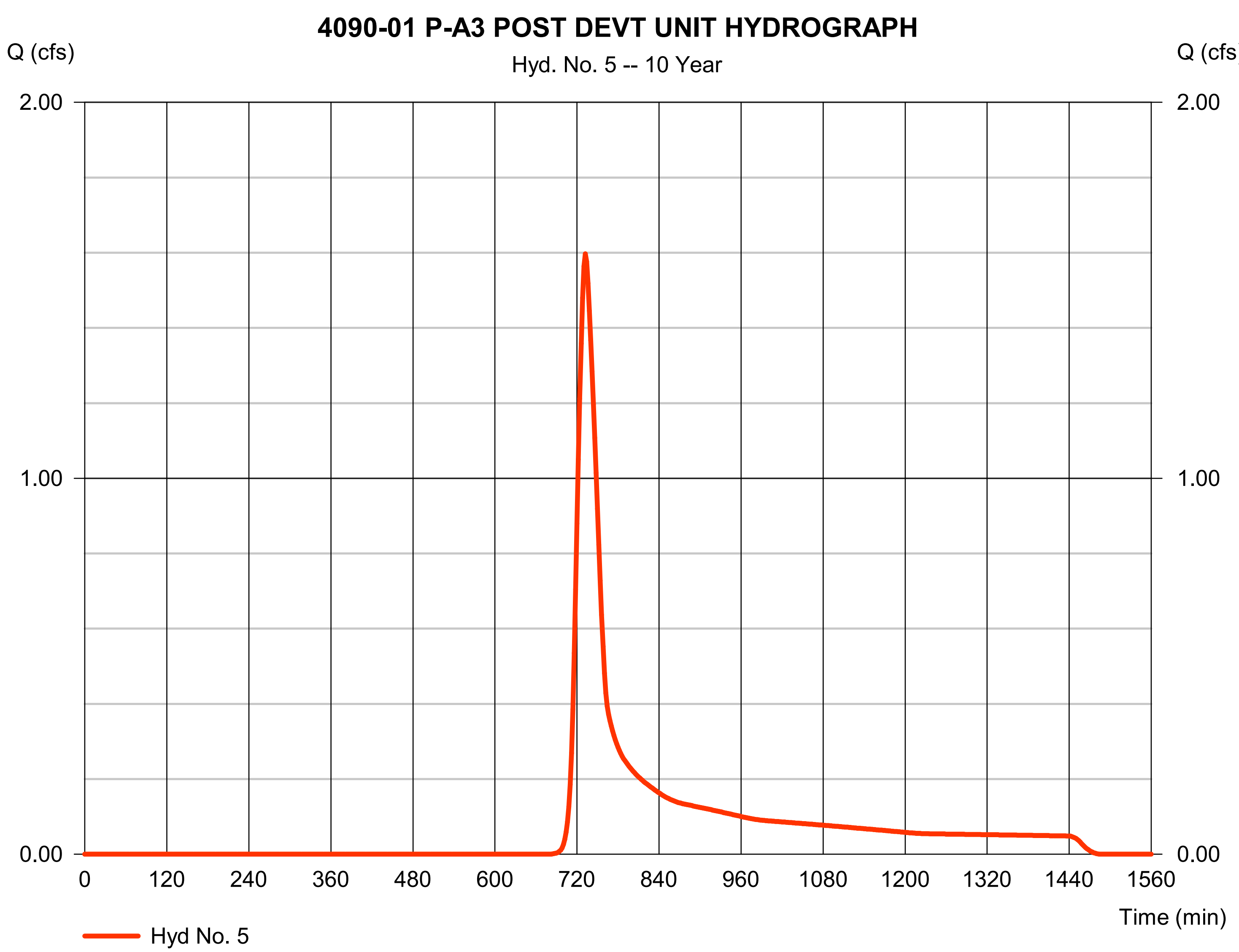
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 5

4090-01 P-A3 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.597 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 7,134 cuft
Drainage area	= 3.090 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 703 ft
Tc method	= LAG	Time of conc. (Tc)	= 29.79 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



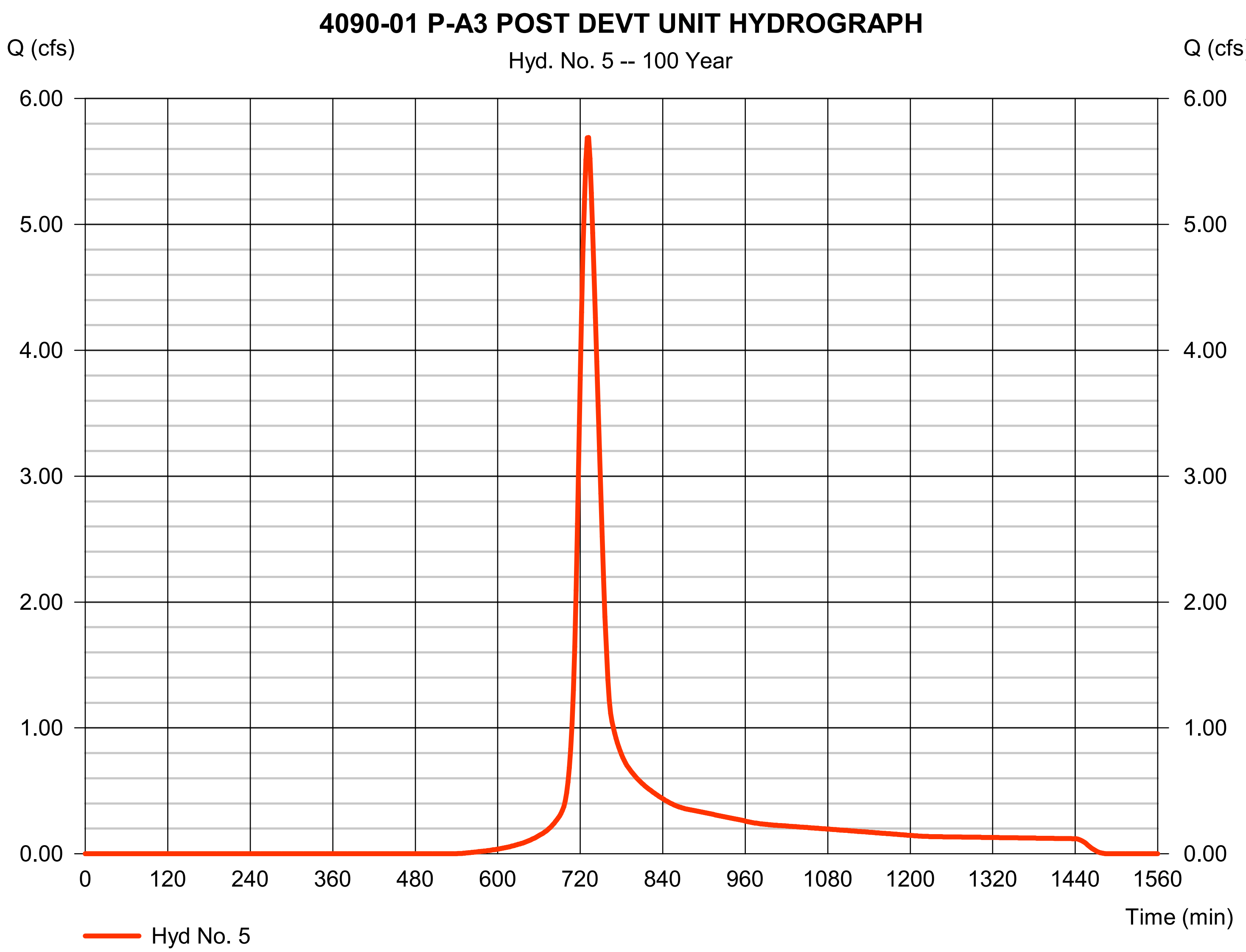
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 5

4090-01 P-A3 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 5.690 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 22,987 cuft
Drainage area	= 3.090 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 703 ft
Tc method	= LAG	Time of conc. (Tc)	= 29.79 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 | Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

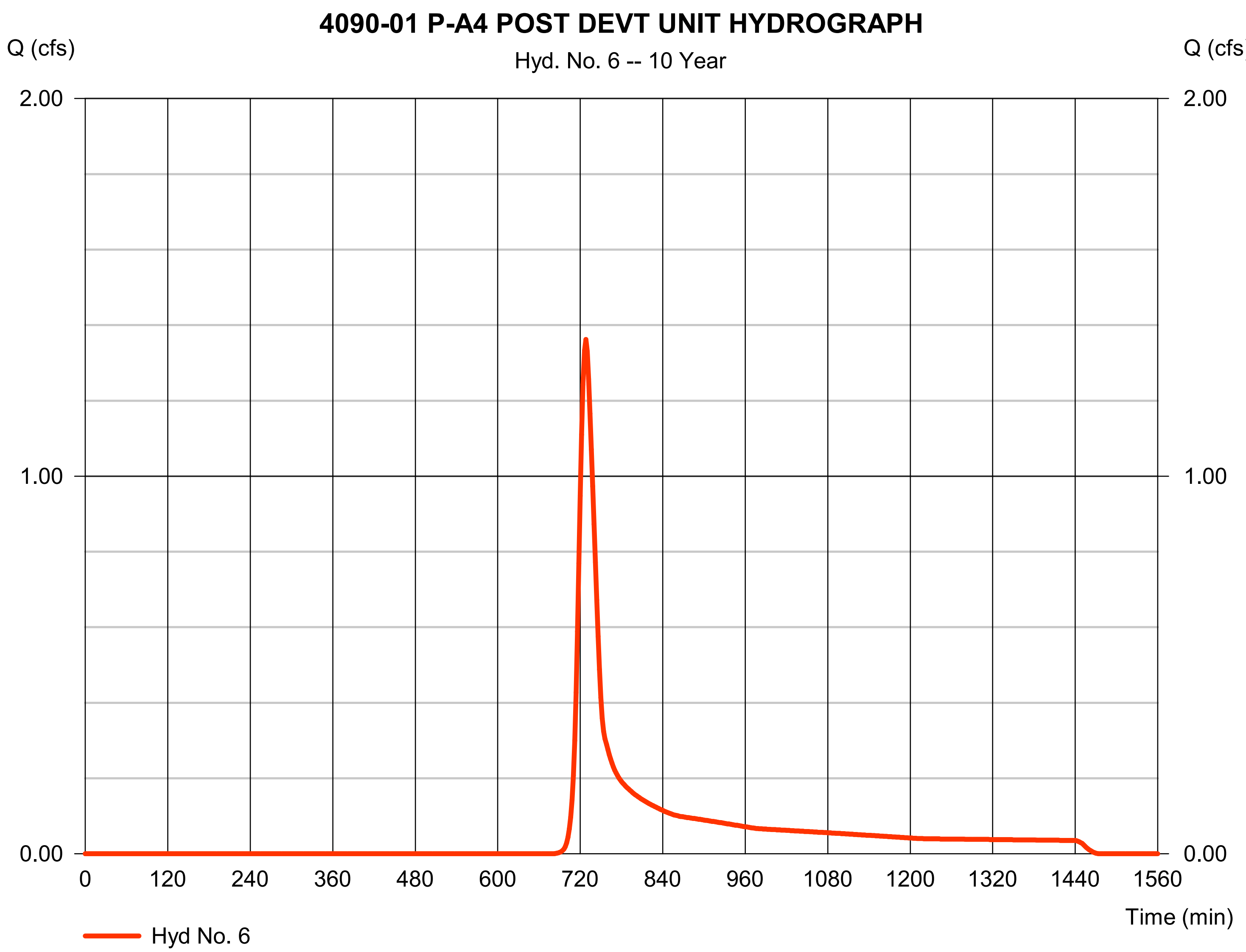
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 6

4090-01 P-A4 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.362 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 5,194 cuft
Drainage area	= 2.210 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 481 ft
Tc method	= LAG	Time of conc. (Tc)	= 20.25 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



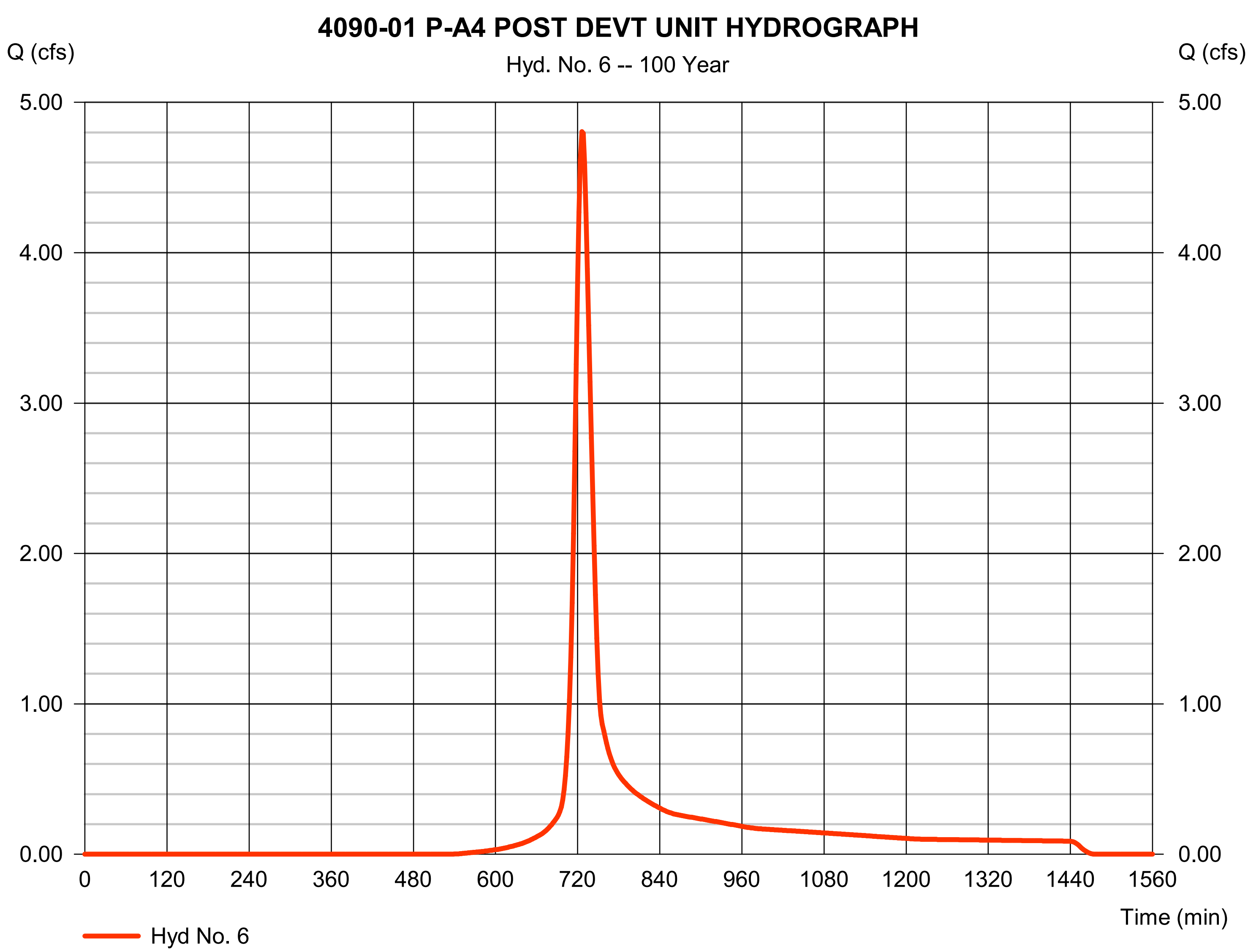
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 | Monday, 06 / 5 / 2023

Hyd. No. 6

4090-01 P-A4 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 4.805 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 16,734 cuft
Drainage area	= 2.210 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 481 ft
Tc method	= LAG	Time of conc. (Tc)	= 20.25 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

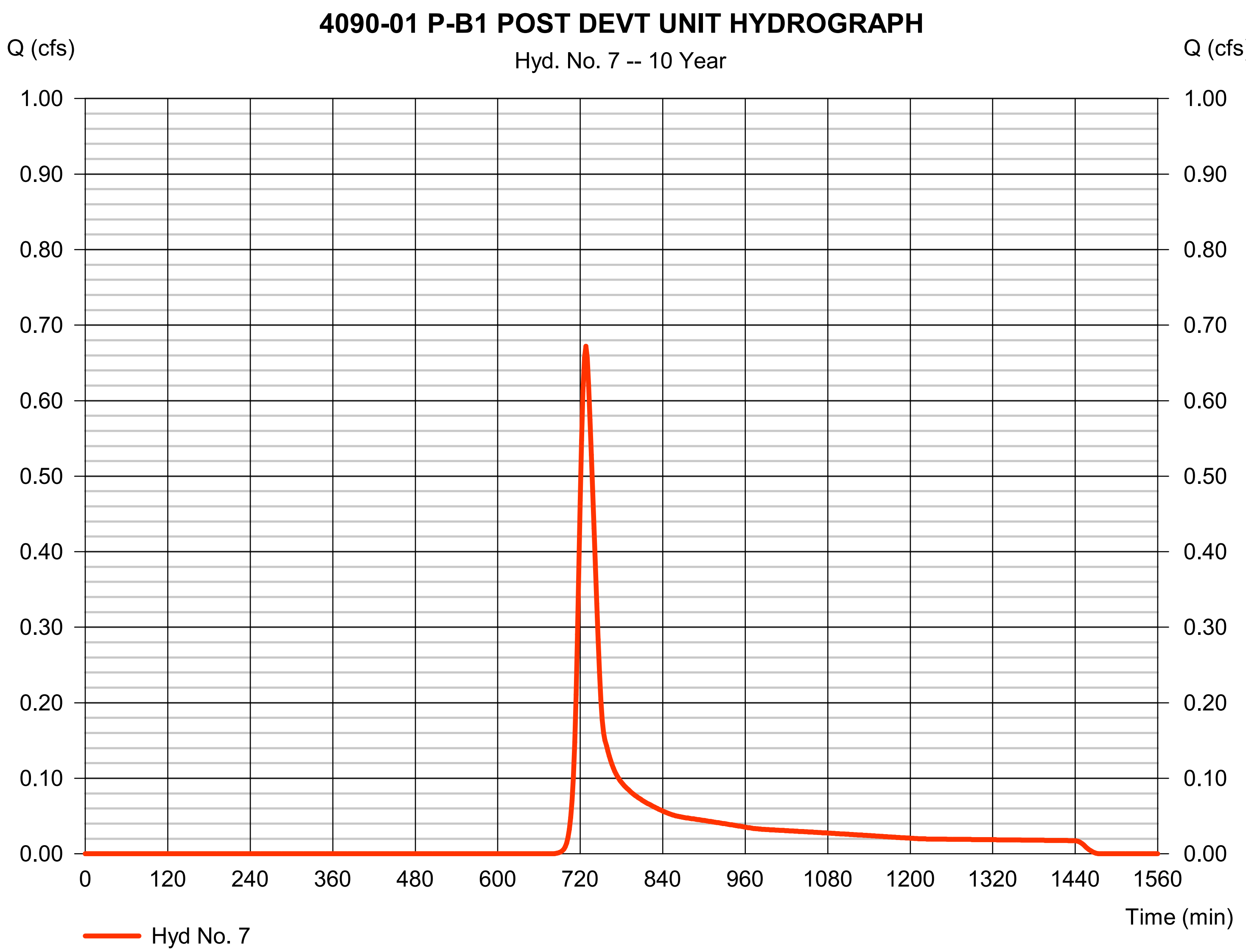
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 7

4090-01 P-B1 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.672 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,562 cuft
Drainage area	= 1.090 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 449 ft
Tc method	= LAG	Time of conc. (Tc)	= 21.37 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



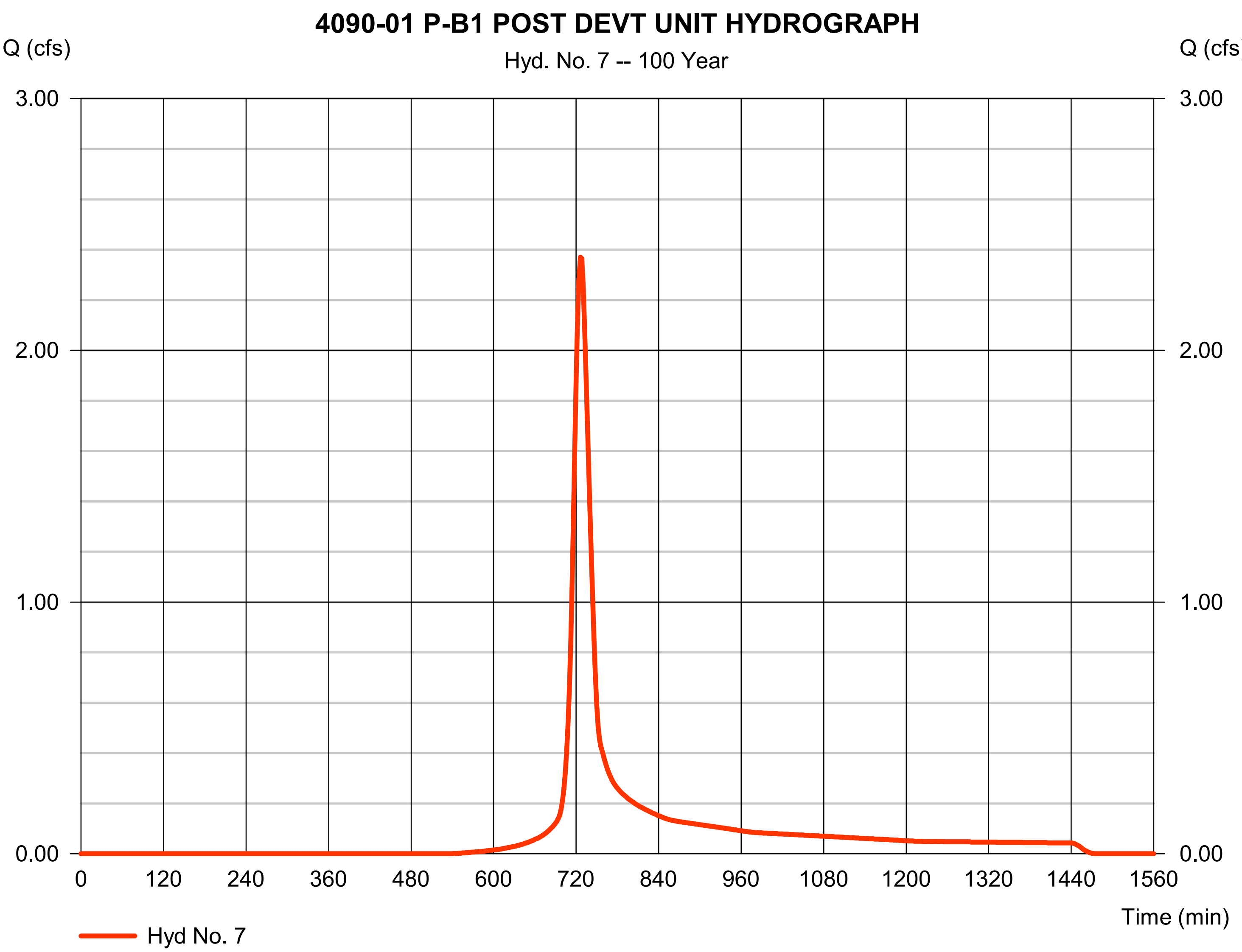
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 7

4090-01 P-B1 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 2.370 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 8,253 cuft
Drainage area	= 1.090 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 449 ft
Tc method	= LAG	Time of conc. (Tc)	= 21.37 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

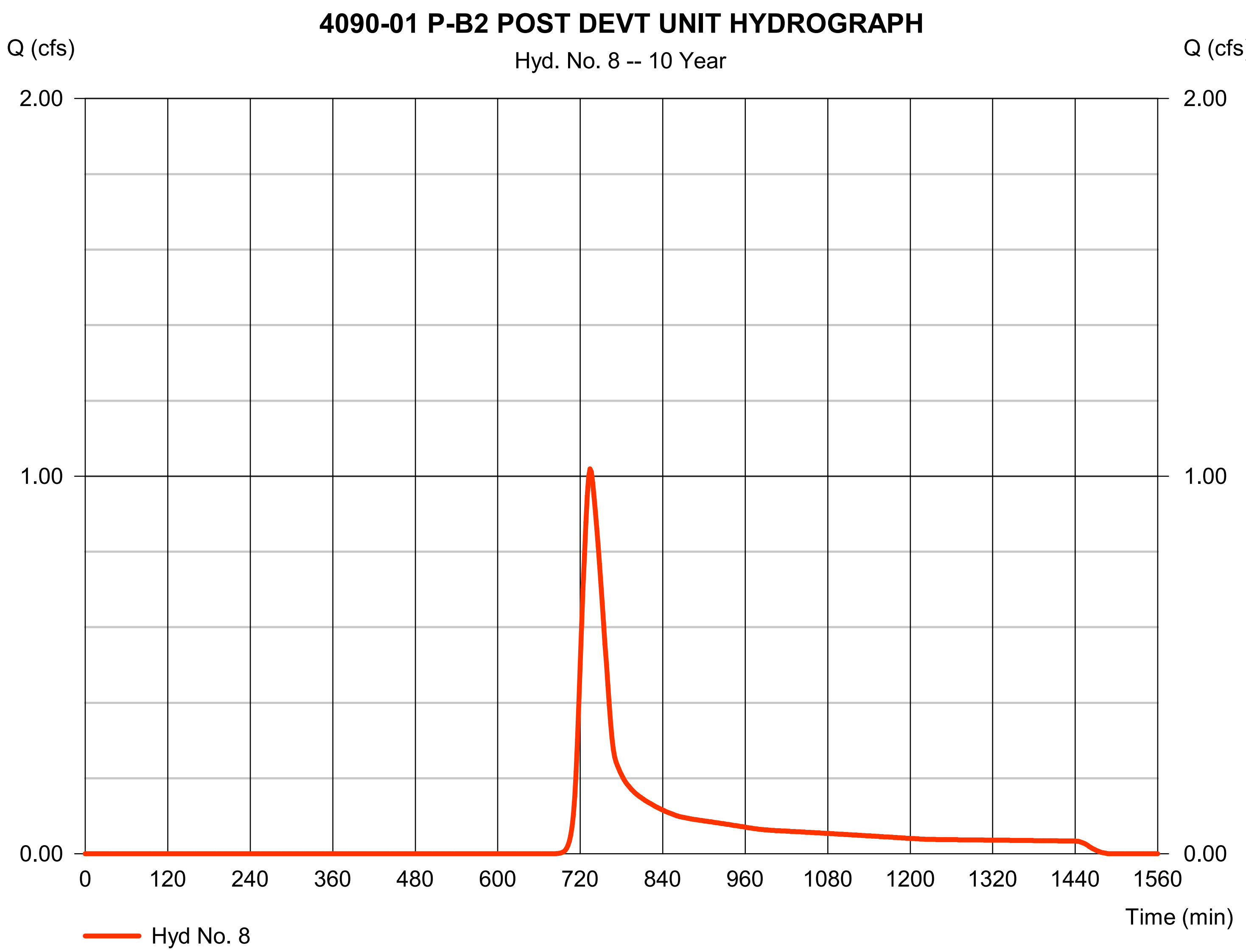
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 8

4090-01 P-B2 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.020 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 4,956 cuft
Drainage area	= 2.120 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 742 ft
Tc method	= LAG	Time of conc. (Tc)	= 33.56 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



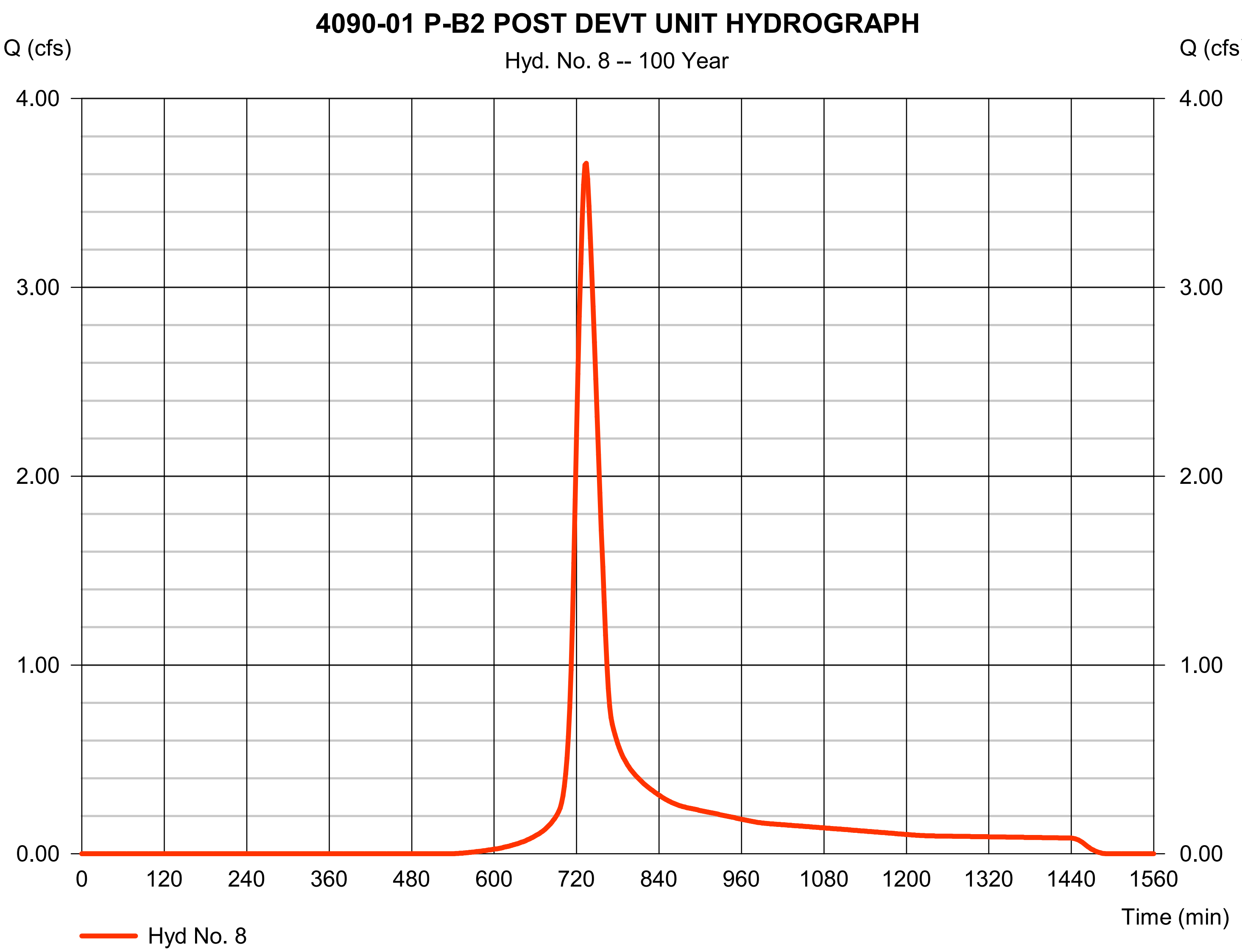
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 8

4090-01 P-B2 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.658 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 15,968 cuft
Drainage area	= 2.120 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 742 ft
Tc method	= LAG	Time of conc. (Tc)	= 33.56 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

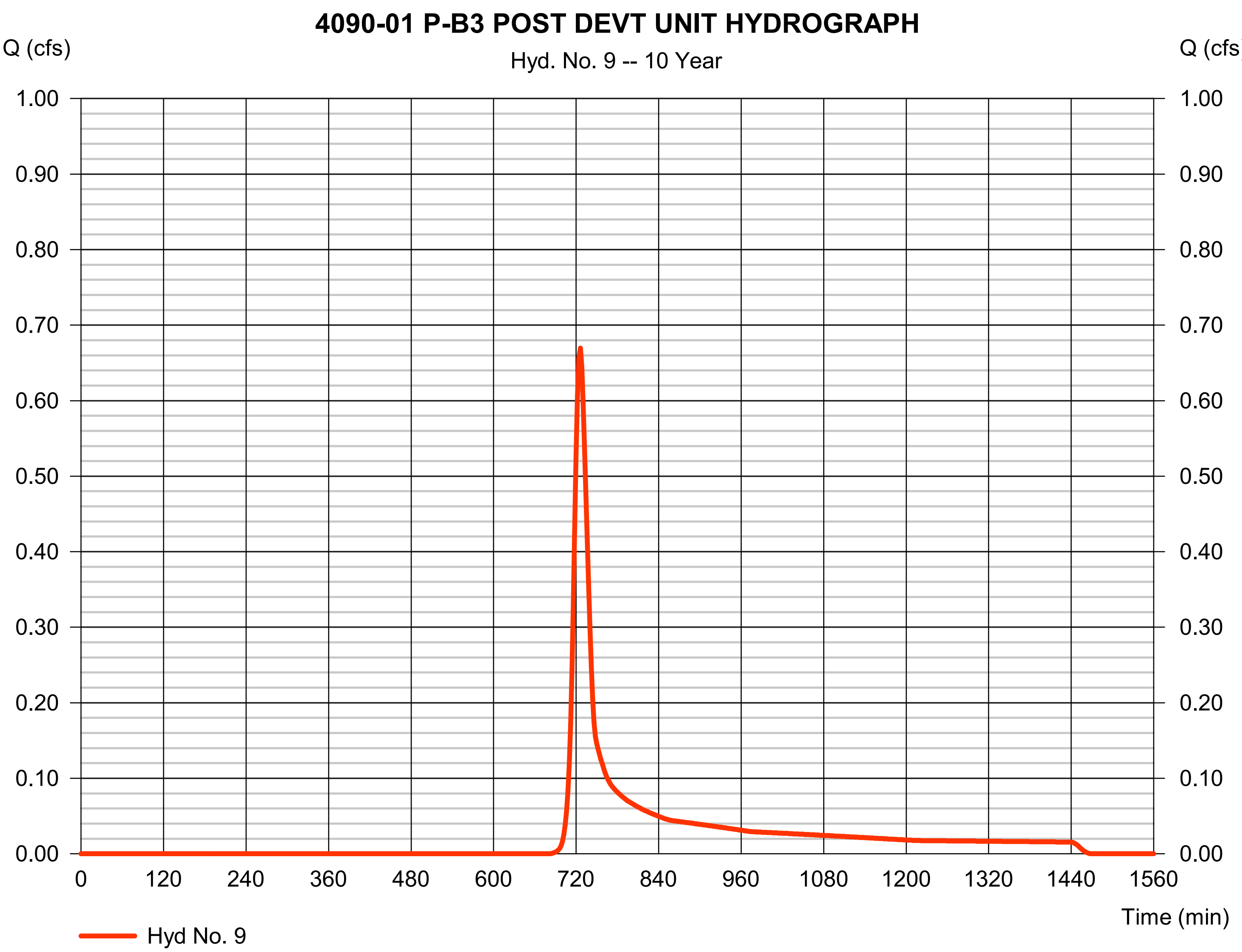
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 9

4090-01 P-B3 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.670 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,286 cuft
Drainage area	= 0.990 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 408 ft
Tc method	= LAG	Time of conc. (Tc)	= 19.15 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



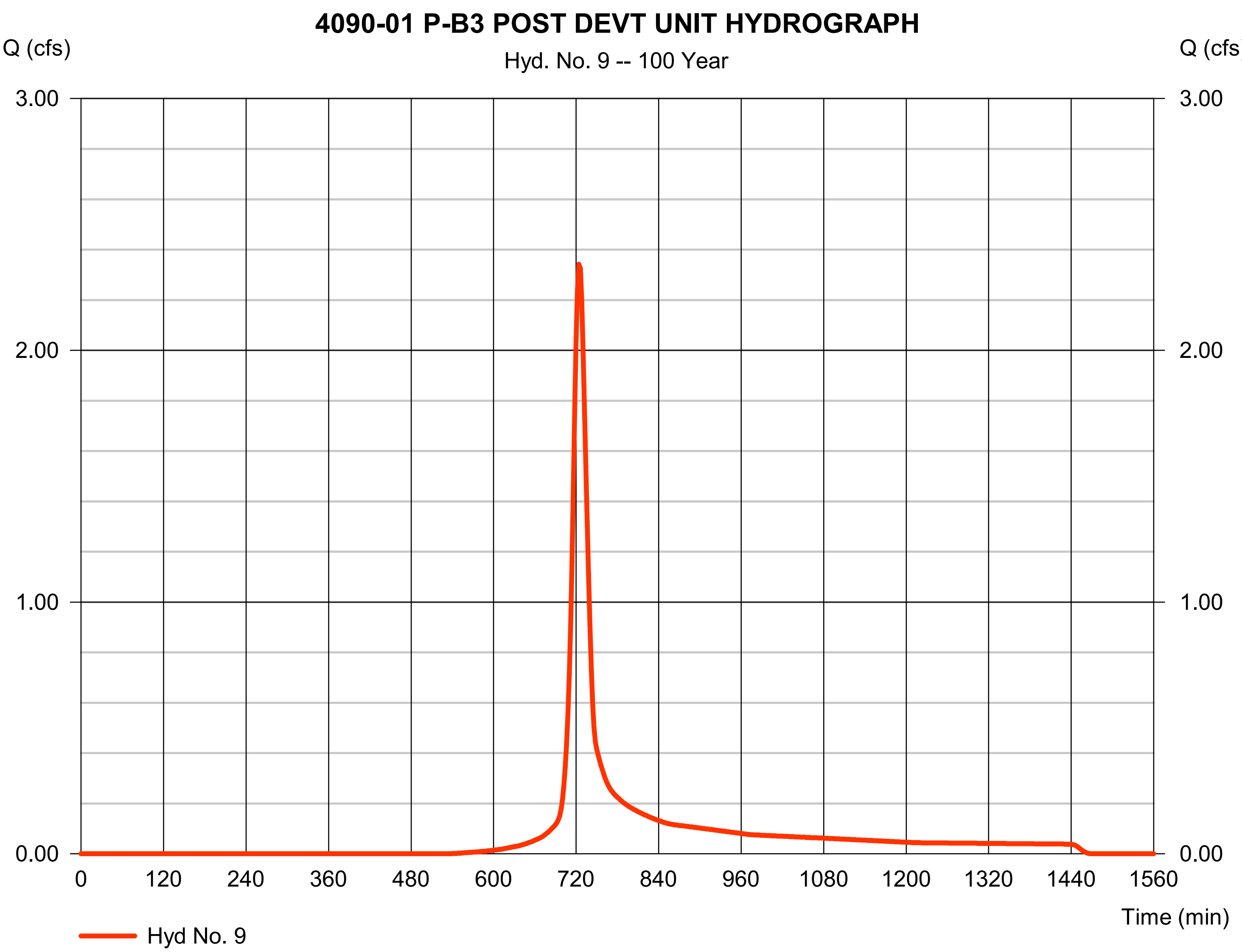
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 9

4090-01 P-B3 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 2.341 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 7,365 cuft
Drainage area	= 0.990 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 408 ft
Tc method	= LAG	Time of conc. (Tc)	= 19.15 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

ne: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

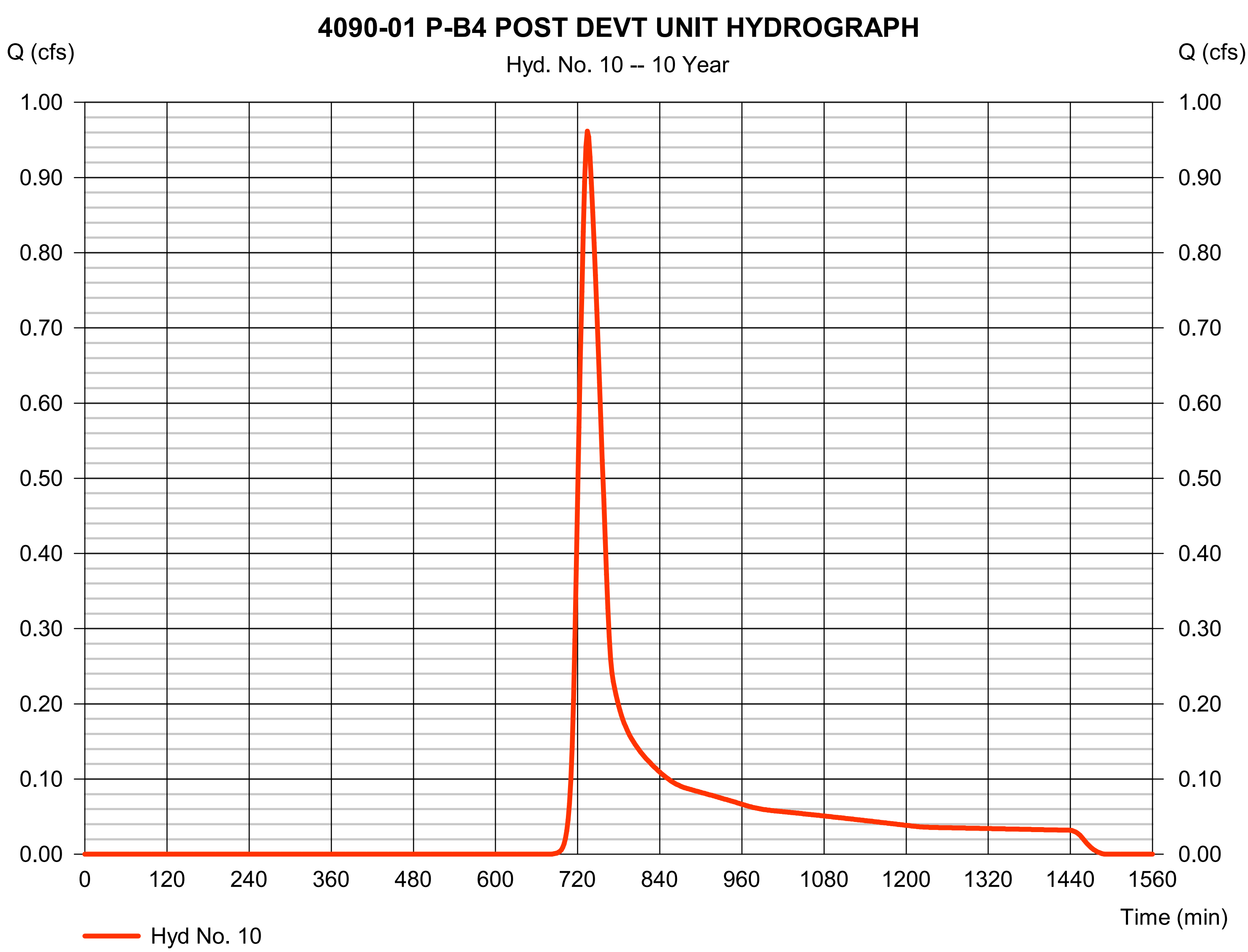
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 10

4090-01 P-B4 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.962 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 4,675 cuft
Drainage area	= 2.000 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 692 ft
Tc method	= LAG	Time of conc. (Tc)	= 31.51 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



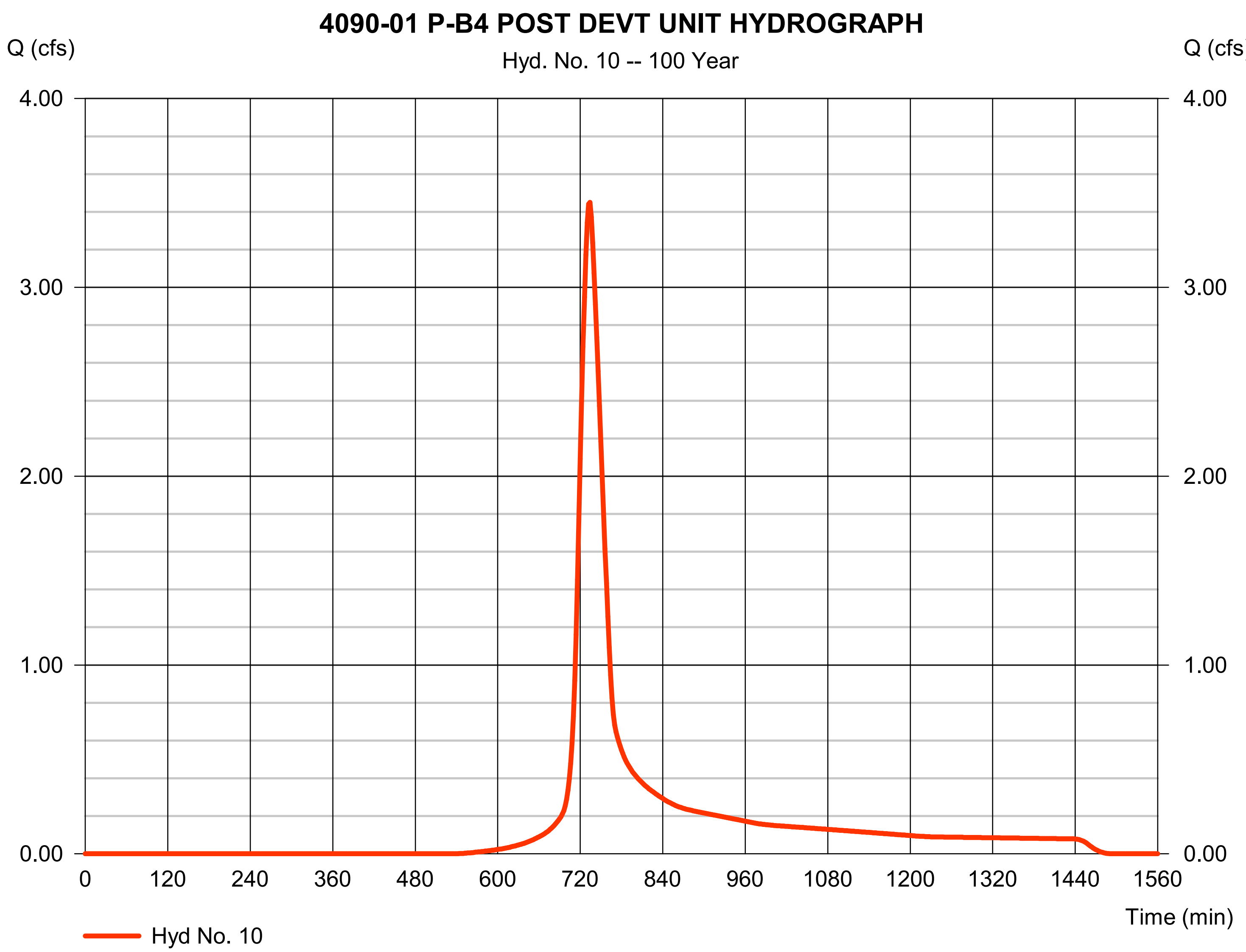
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 10

4090-01 P-B4 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.451 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 15,064 cuft
Drainage area	= 2.000 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 692 ft
Tc method	= LAG	Time of conc. (Tc)	= 31.51 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

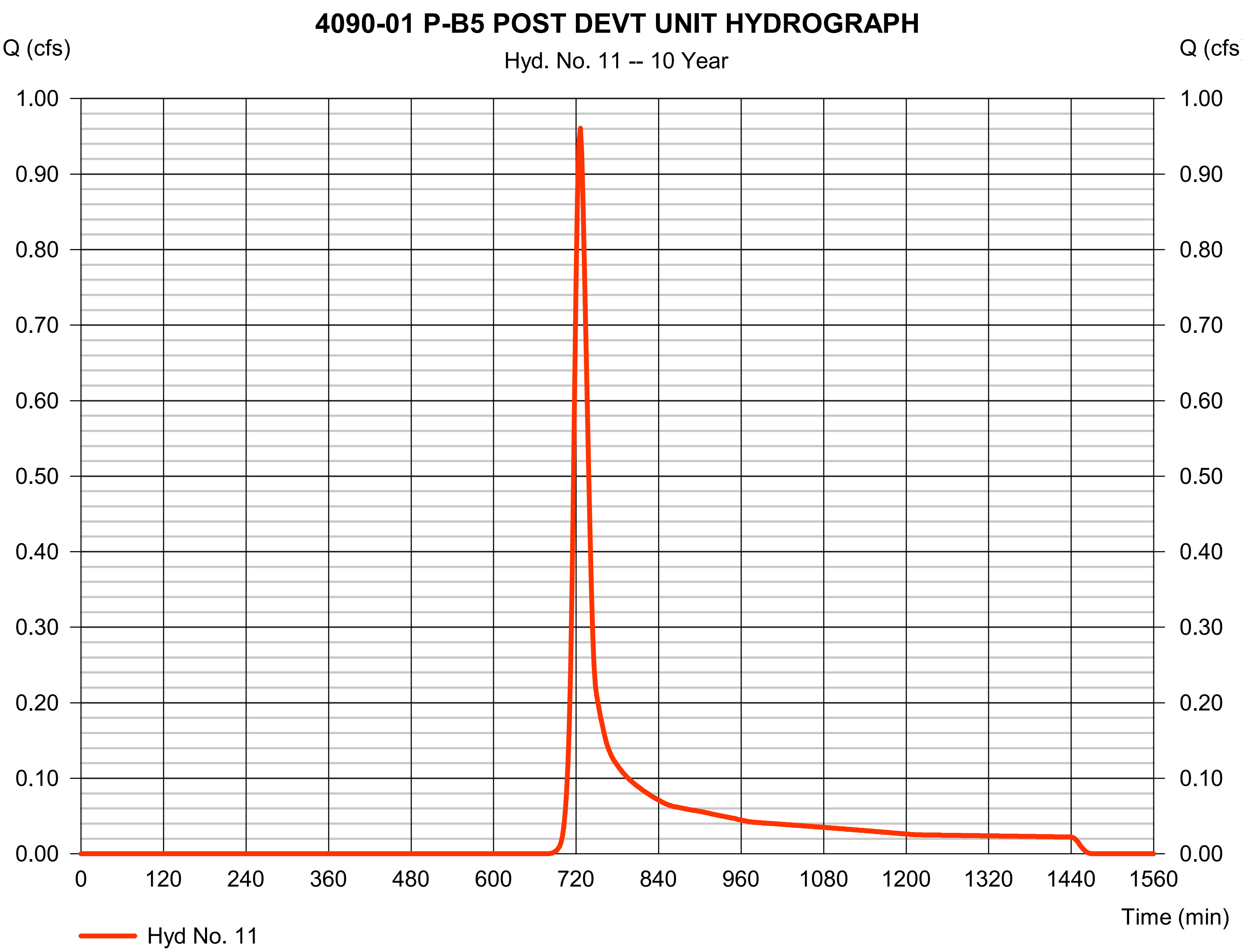
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 11

4090-01 P-B5 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.961 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 3,279 cuft
Drainage area	= 1.420 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 458 ft
Tc method	= LAG	Time of conc. (Tc)	= 20.02 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



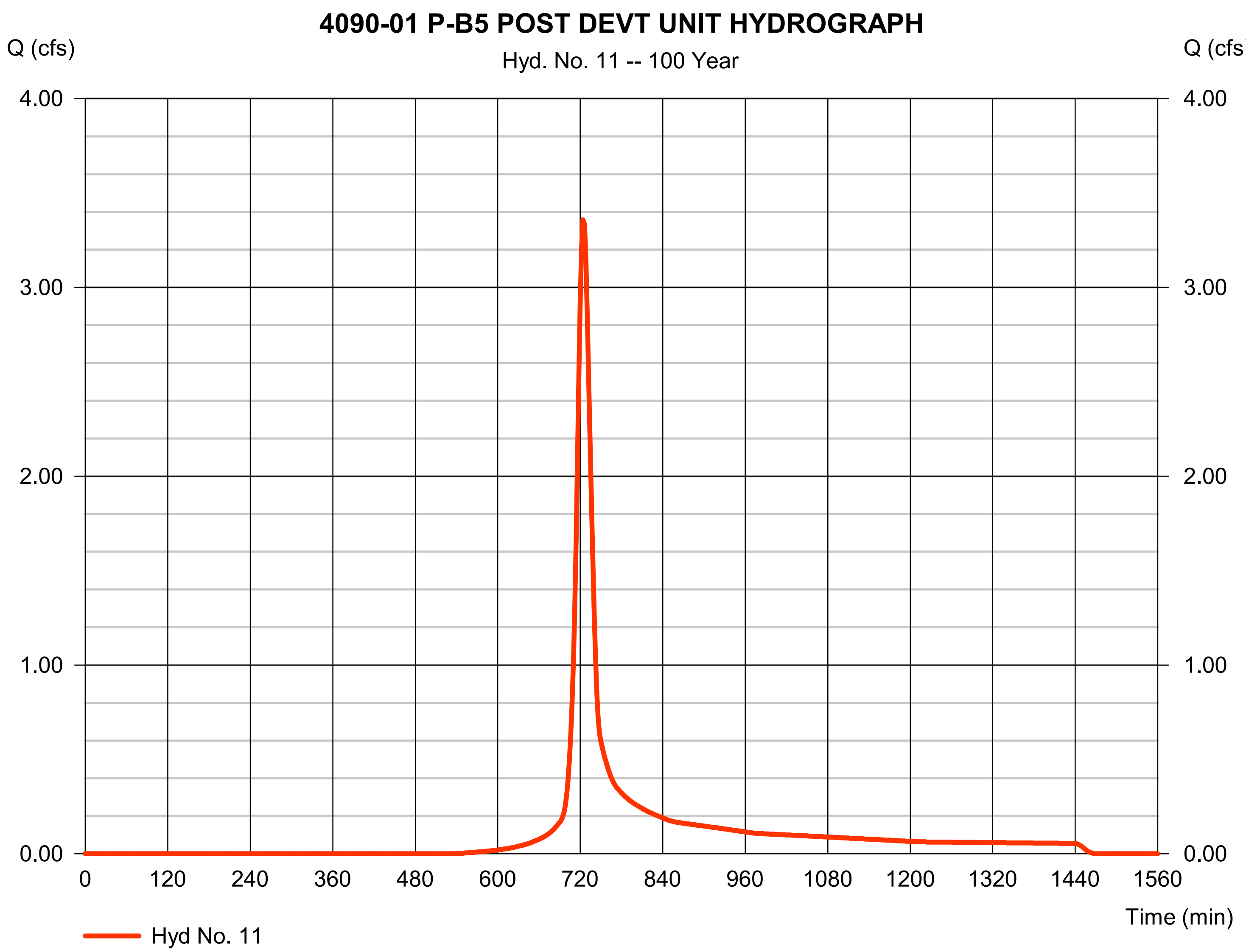
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 11

4090-01 P-B5 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.358 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 10,563 cuft
Drainage area	= 1.420 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 458 ft
Tc method	= LAG	Time of conc. (Tc)	= 20.02 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

ne: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

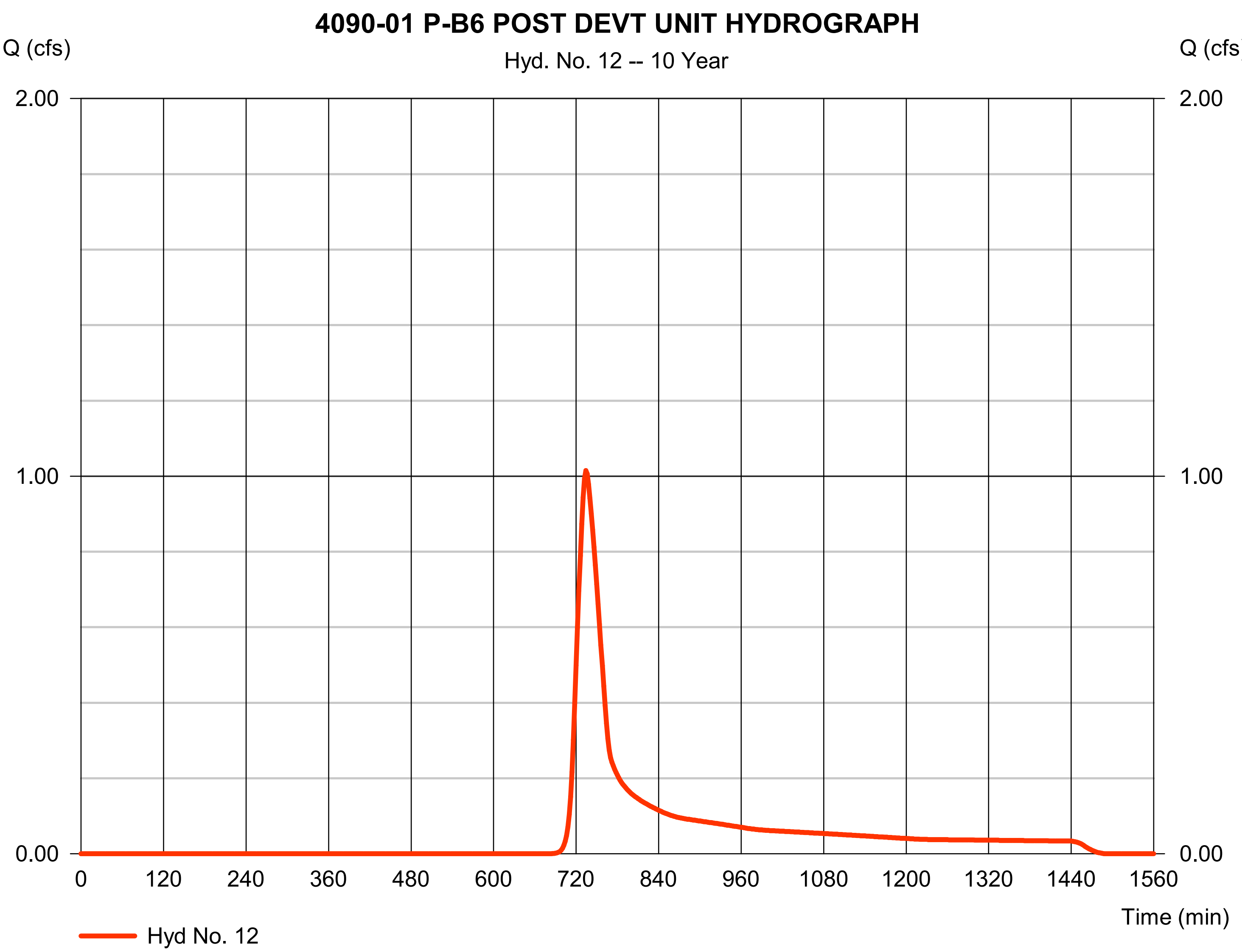
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 12

4090-01 P-B6 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.015 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 4,933 cuft
Drainage area	= 2.110 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 857 ft
Tc method	= LAG	Time of conc. (Tc)	= 30.98 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



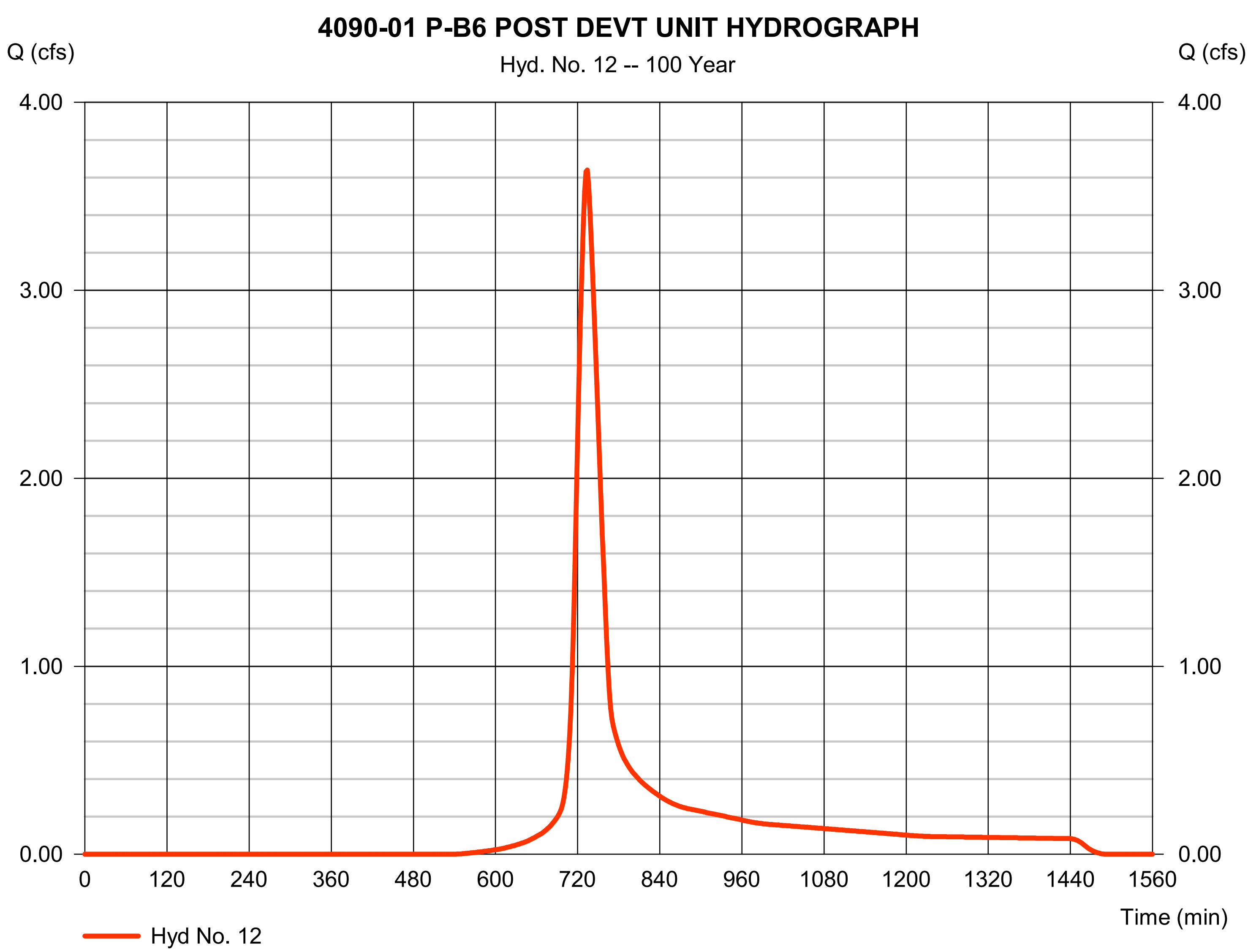
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 12

4090-01 P-B6 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.640 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 15,893 cuft
Drainage area	= 2.110 ac	Curve number	= 77
Basin Slope	= 1.0 %	Hydraulic length	= 857 ft
Tc method	= LAG	Time of conc. (Tc)	= 30.98 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

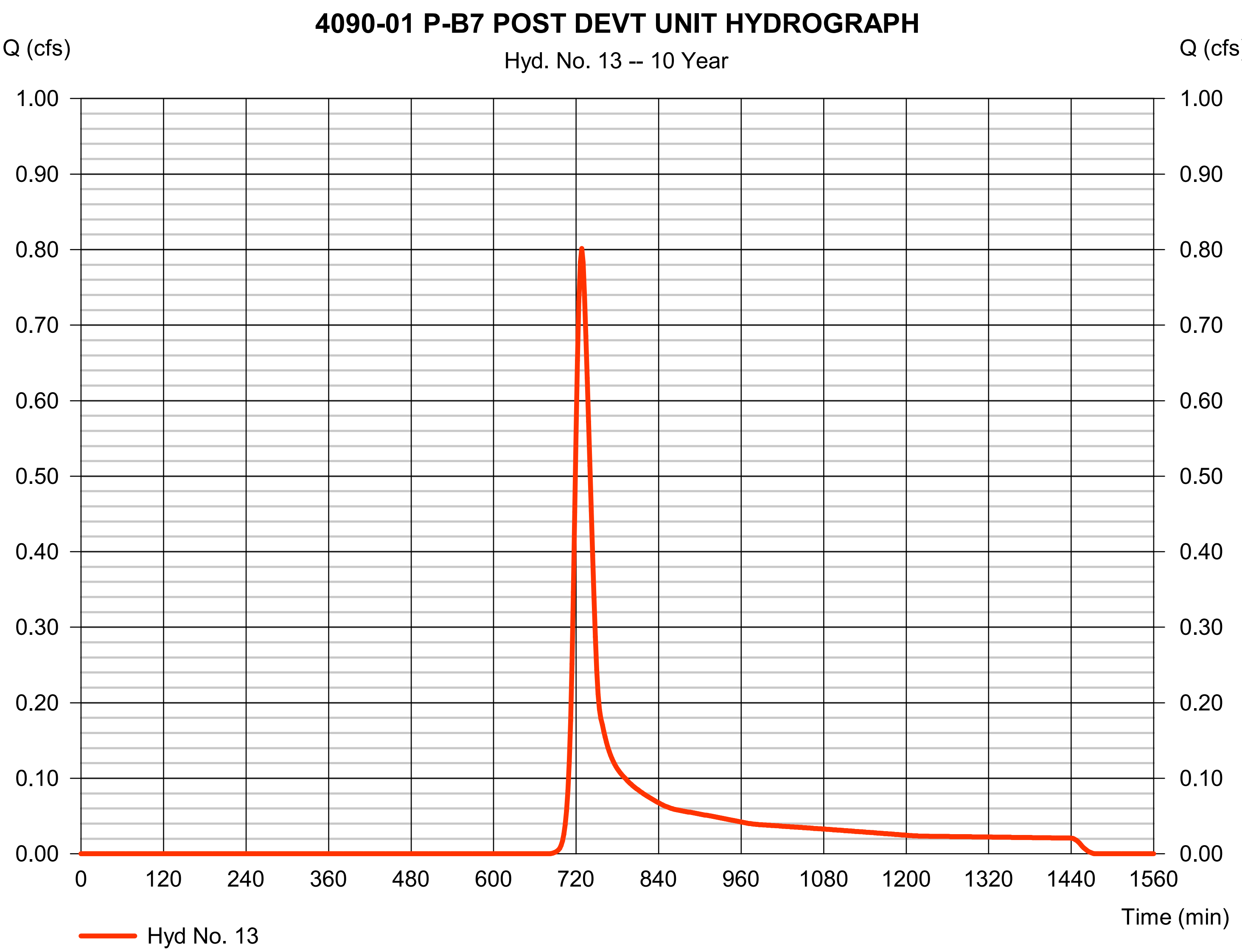
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 13

4090-01 P-B7 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.801 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 3,055 cuft
Drainage area	= 1.300 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 475 ft
Tc method	= LAG	Time of conc. (Tc)	= 20.50 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



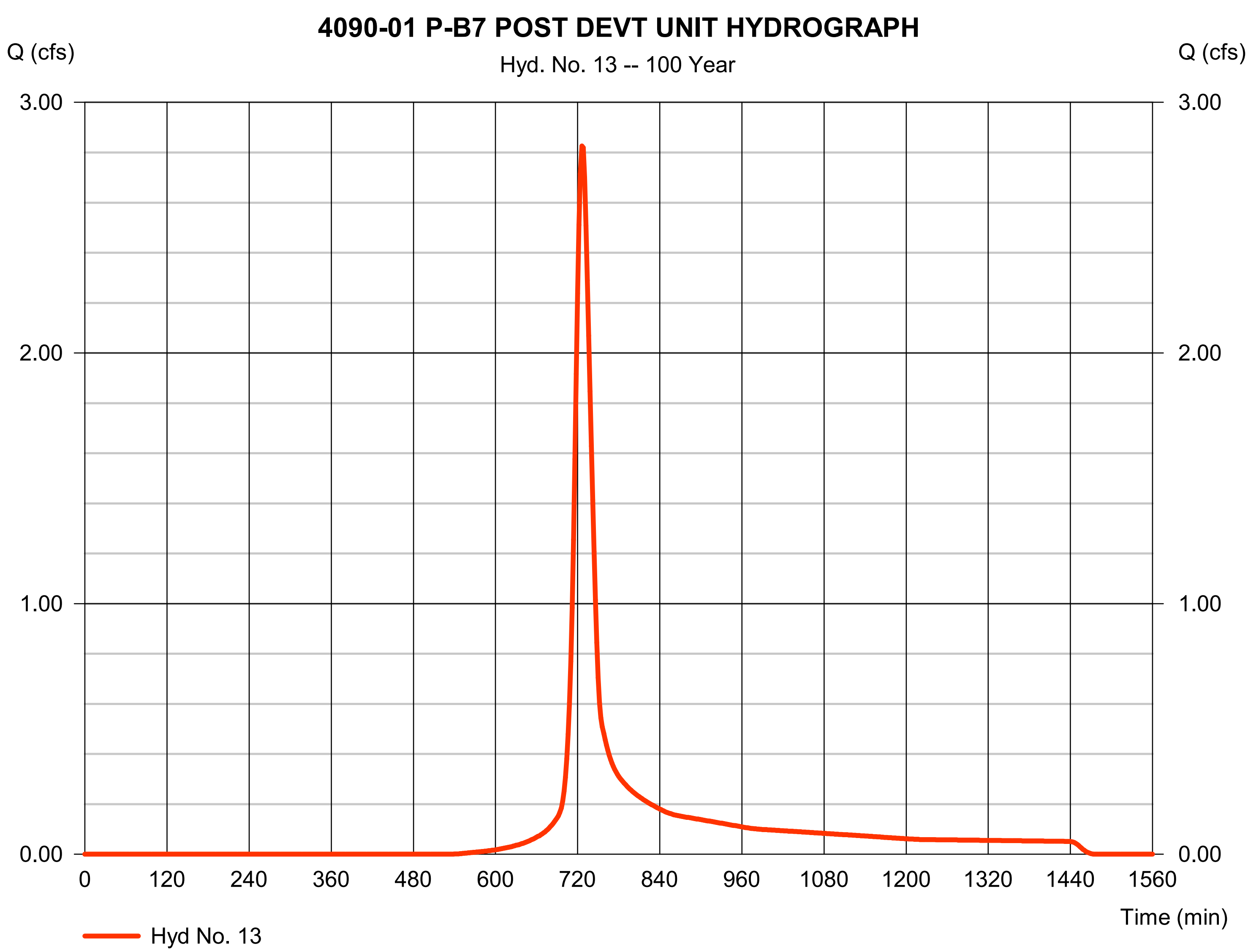
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 13

4090-01 P-B7 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 2.826 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 9,843 cuft
Drainage area	= 1.300 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 475 ft
Tc method	= LAG	Time of conc. (Tc)	= 20.50 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

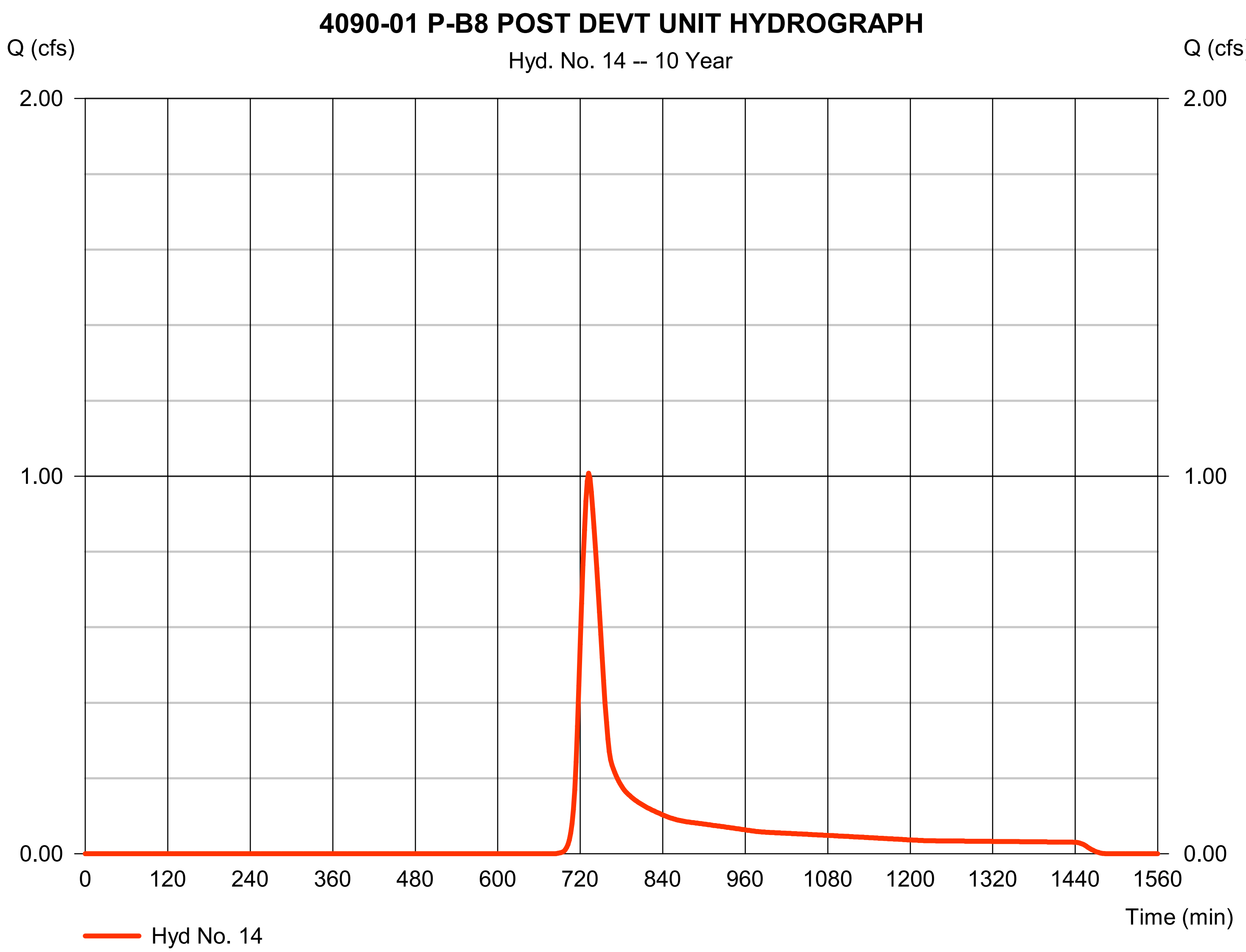
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 14

4090-01 P-B8 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.008 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 4,502 cuft
Drainage area	= 1.950 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 669 ft
Tc method	= LAG	Time of conc. (Tc)	= 27.59 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



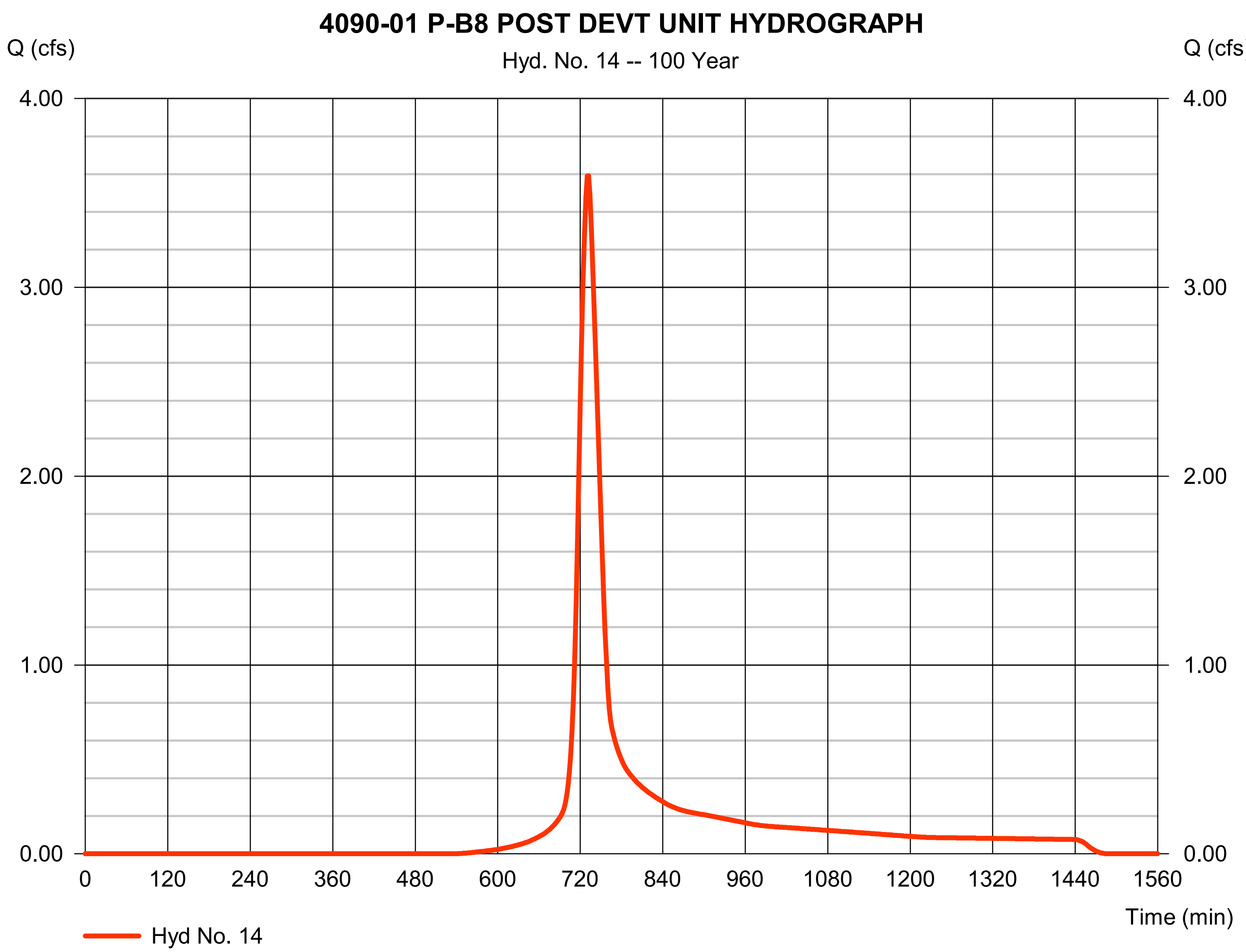
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 14

4090-01 P-B8 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.591 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 14,506 cuft
Drainage area	= 1.950 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 669 ft
Tc method	= LAG	Time of conc. (Tc)	= 27.59 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

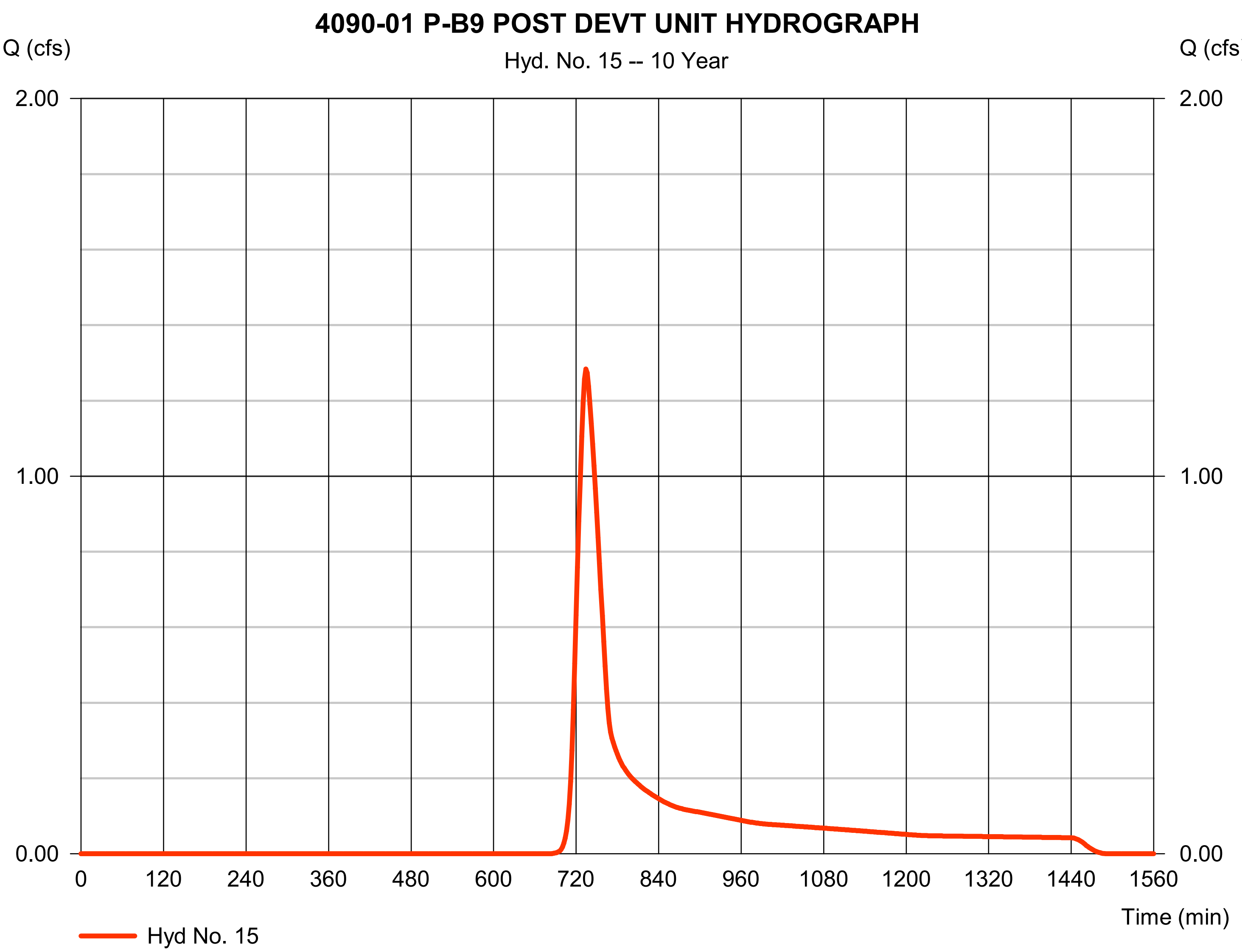
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 15

4090-01 P-B9 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.284 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 6,242 cuft
Drainage area	= 2.670 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 725 ft
Tc method	= LAG	Time of conc. (Tc)	= 31.56 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



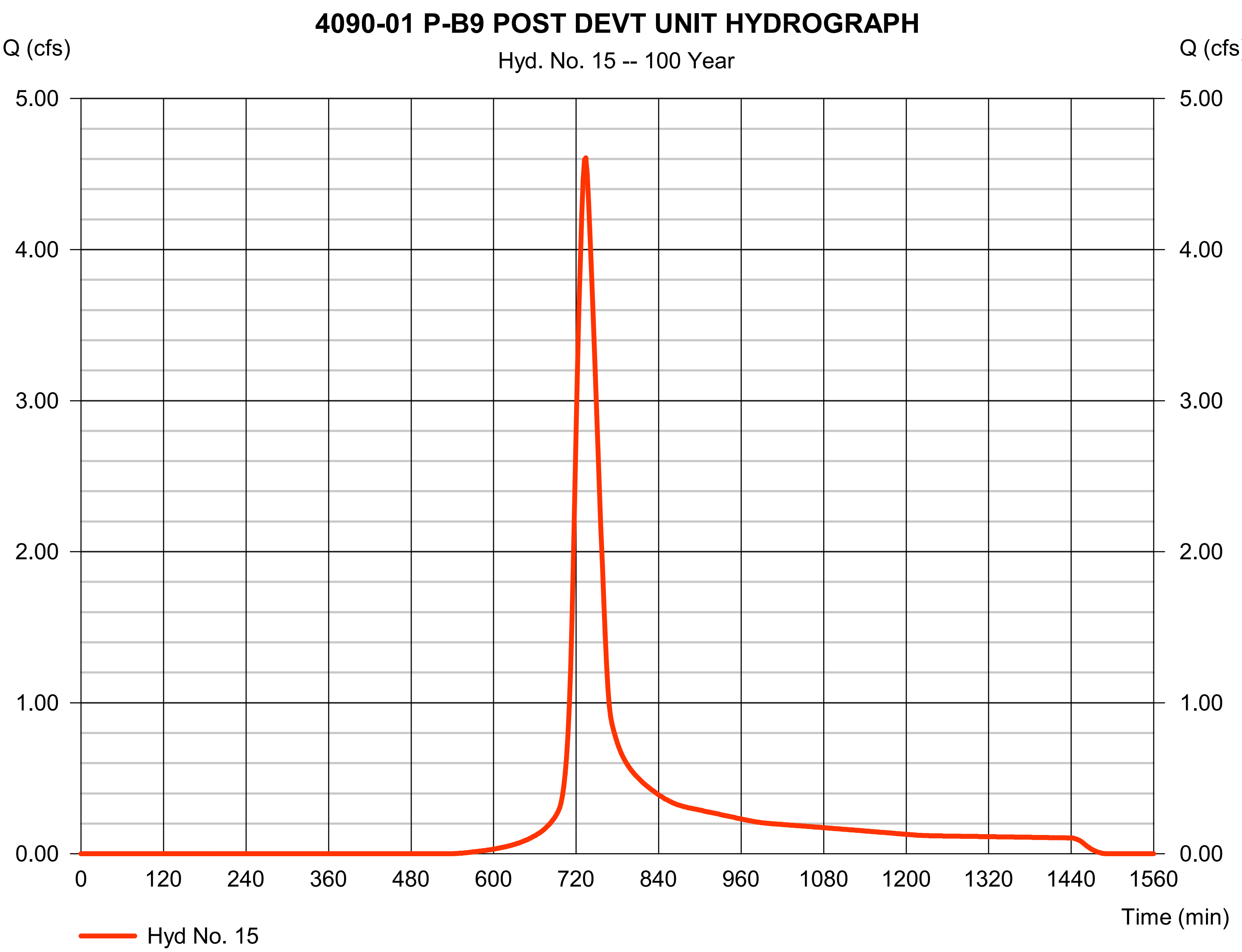
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 15

4090-01 P-B9 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 4.606 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 20,111 cuft
Drainage area	= 2.670 ac	Curve number	= 77
Basin Slope	= 0.7 %	Hydraulic length	= 725 ft
Tc method	= LAG	Time of conc. (Tc)	= 31.56 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

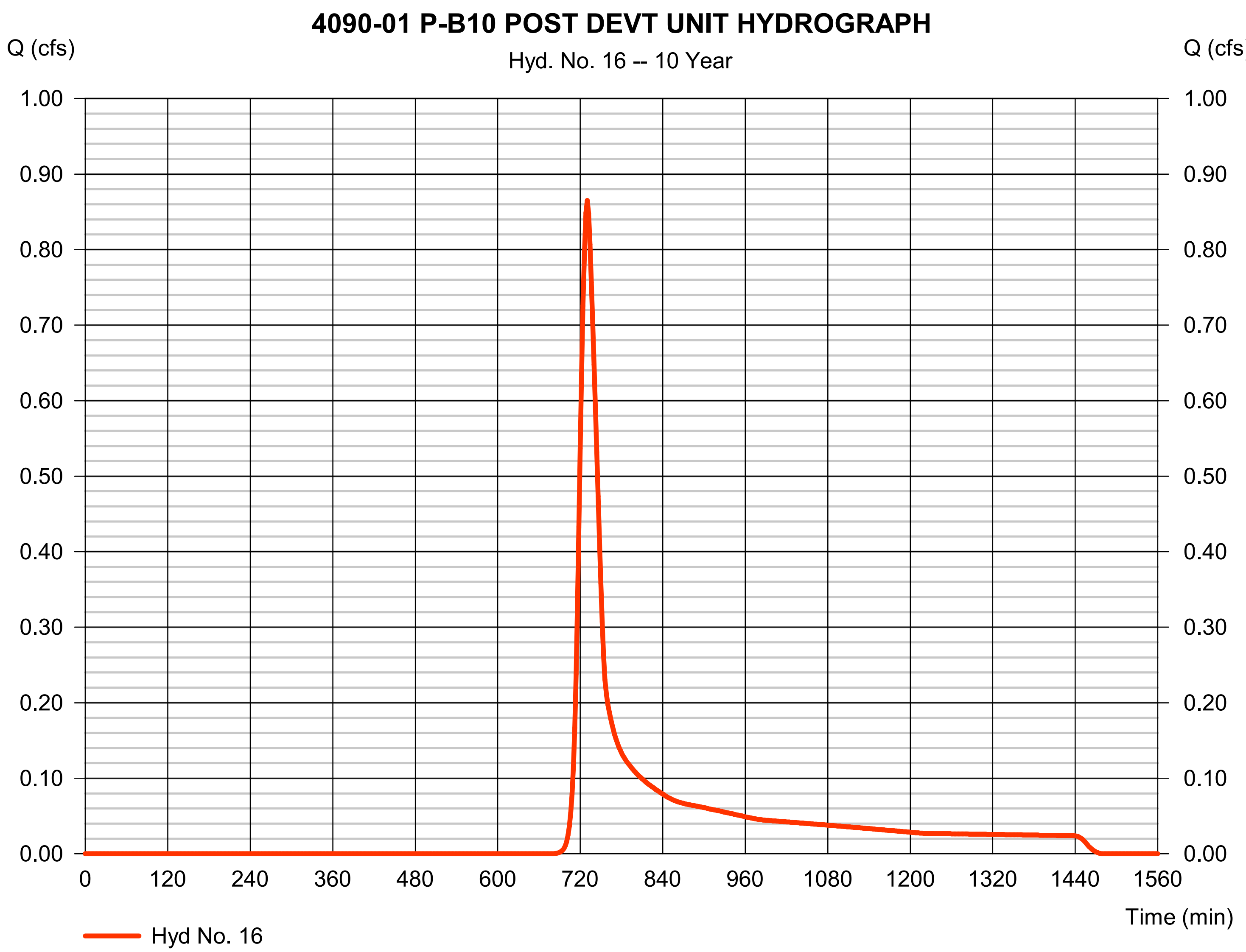
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 | Monday, 06 / 5 / 2023

Hyd. No. 16

4090-01 P-B10 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.865 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 3,523 cuft
Drainage area	= 1.550 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 578 ft
Tc method	= LAG	Time of conc. (Tc)	= 24.55 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



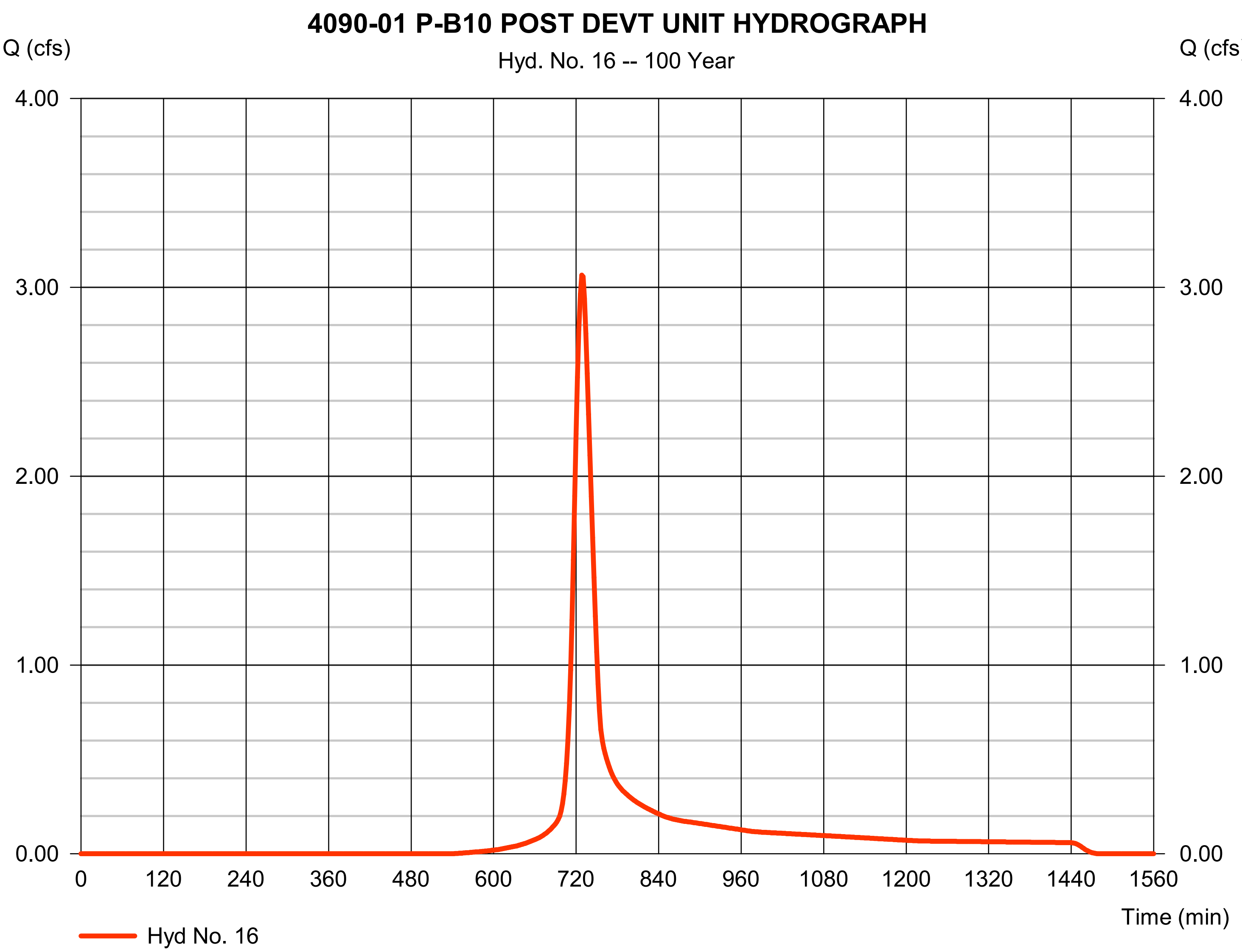
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 16

4090-01 P-B10 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.065 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 11,350 cuft
Drainage area	= 1.550 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 578 ft
Tc method	= LAG	Time of conc. (Tc)	= 24.55 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

ne: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

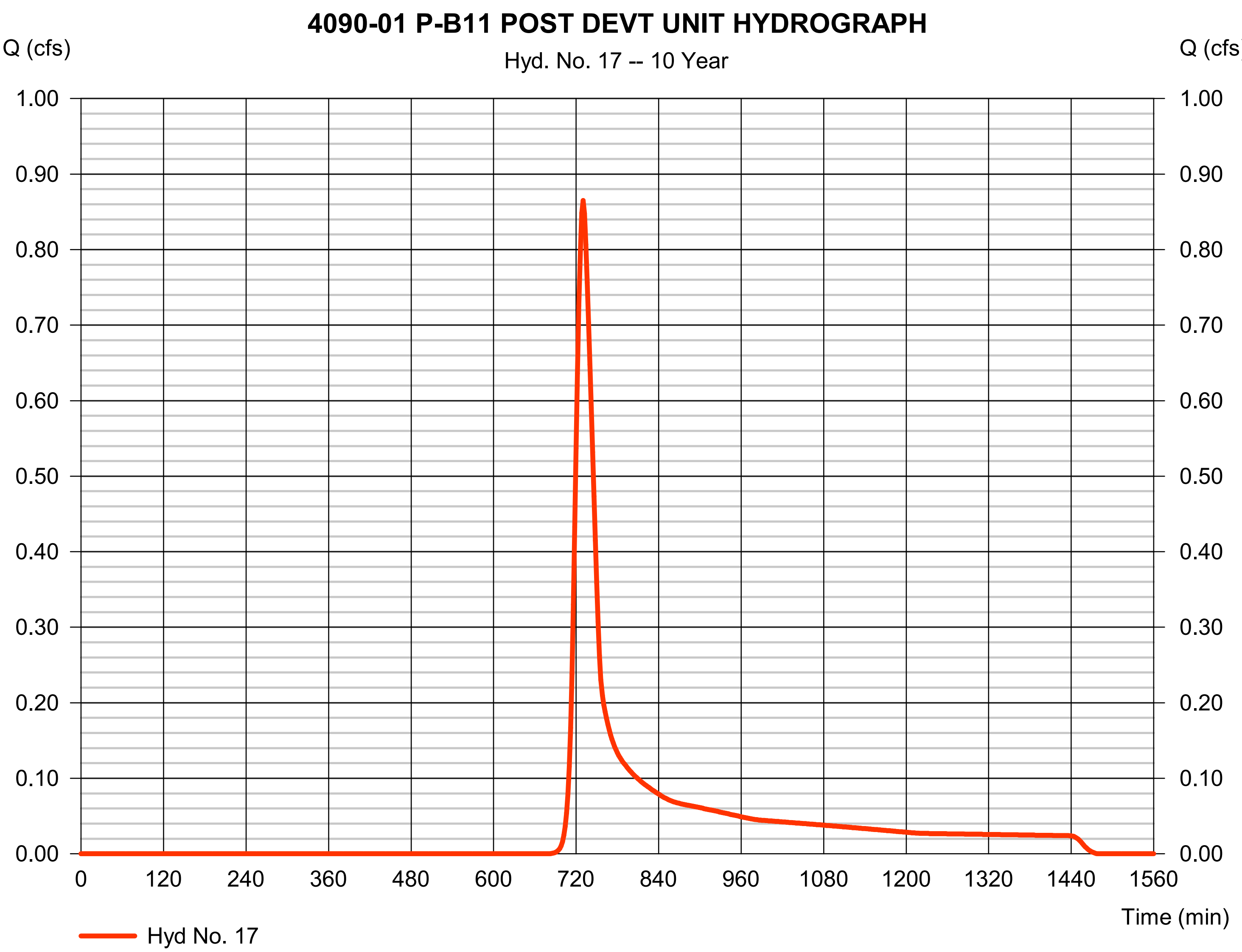
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 17

4090-01 P-B11 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.865 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 3,523 cuft
Drainage area	= 1.550 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 578 ft
Tc method	= LAG	Time of conc. (Tc)	= 24.55 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



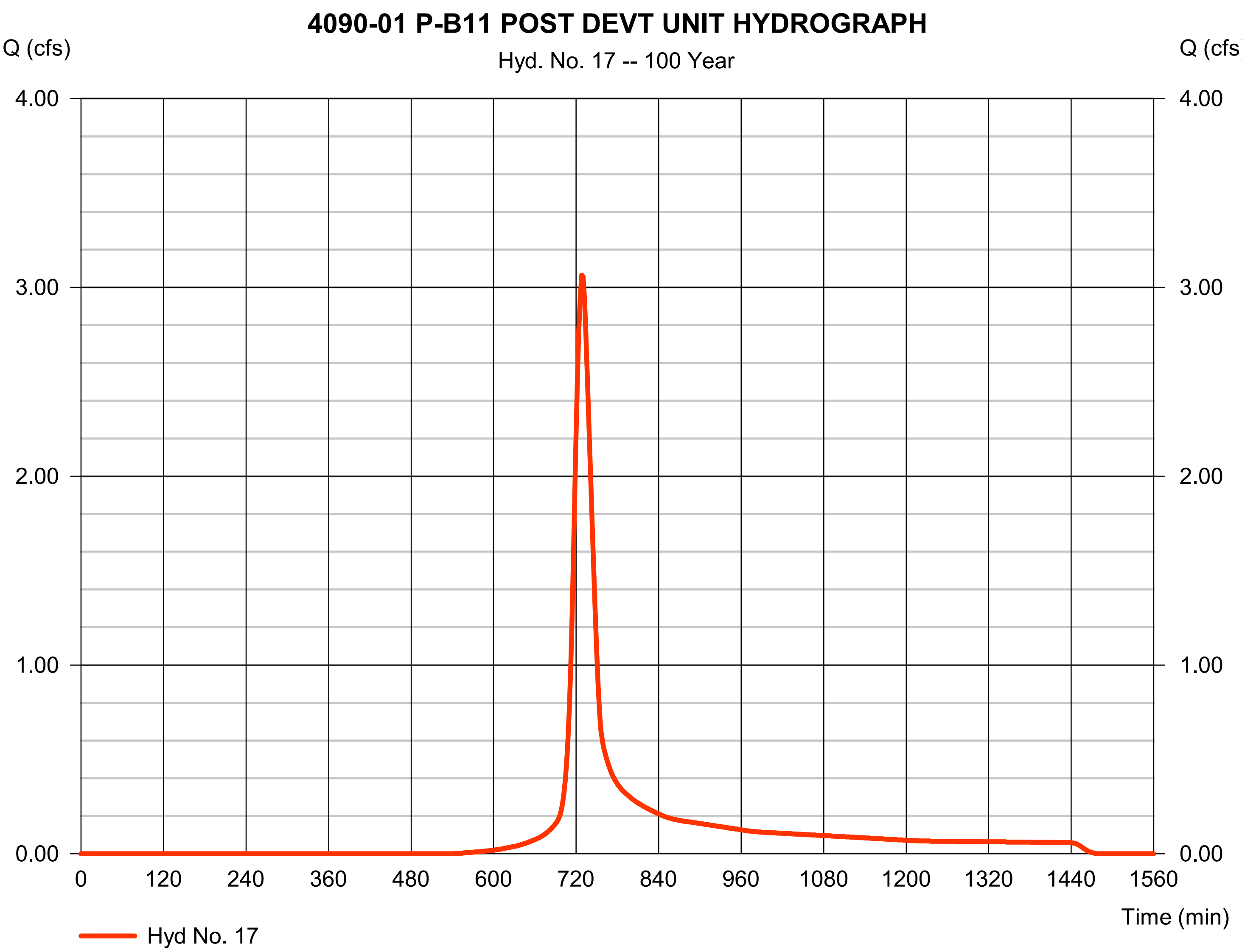
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 17

4090-01 P-B11 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.065 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 11,350 cuft
Drainage area	= 1.550 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 578 ft
Tc method	= LAG	Time of conc. (Tc)	= 24.55 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

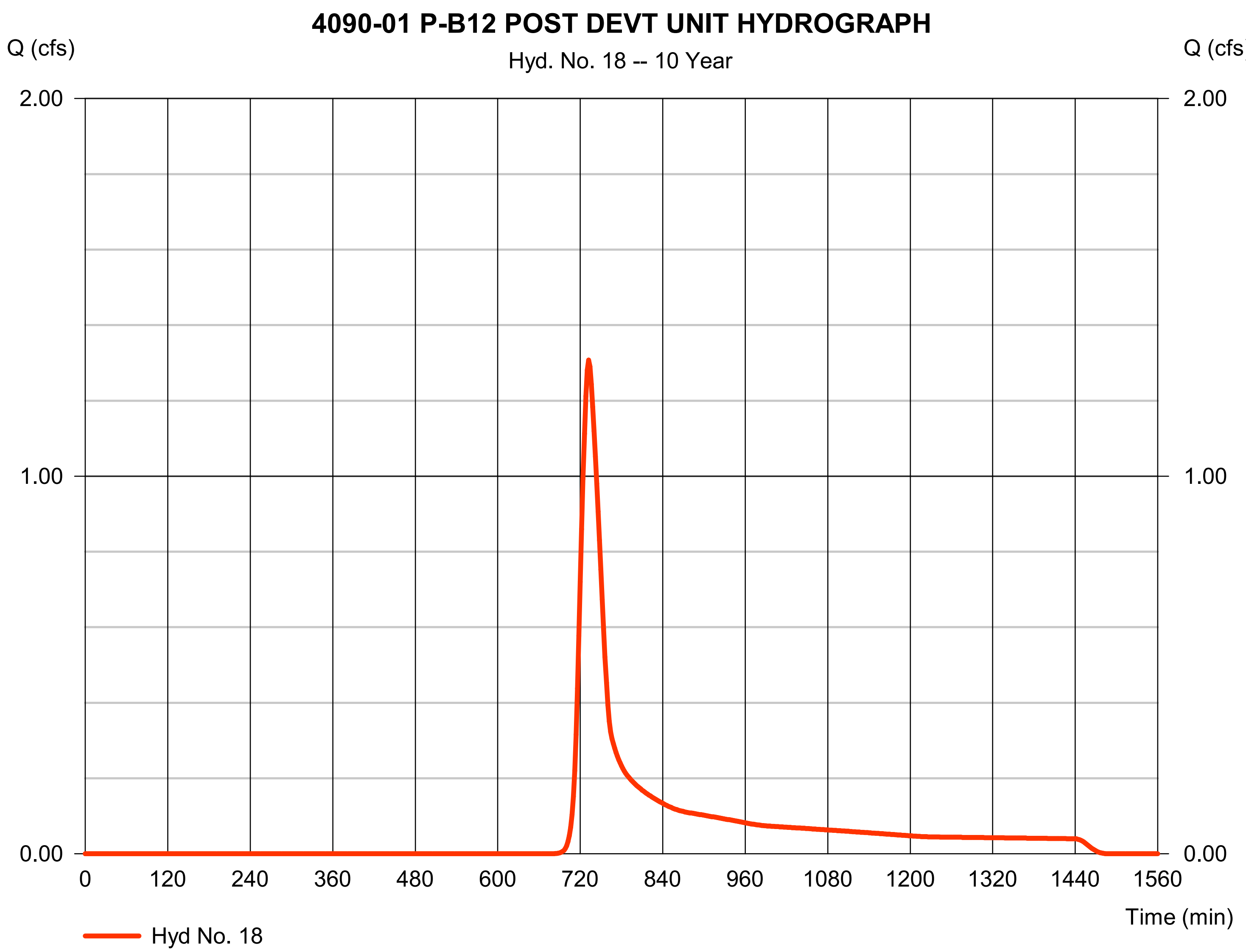
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 18

4090-01 P-B12 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.307 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 5,841 cuft
Drainage area	= 2.530 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 746 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.31 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



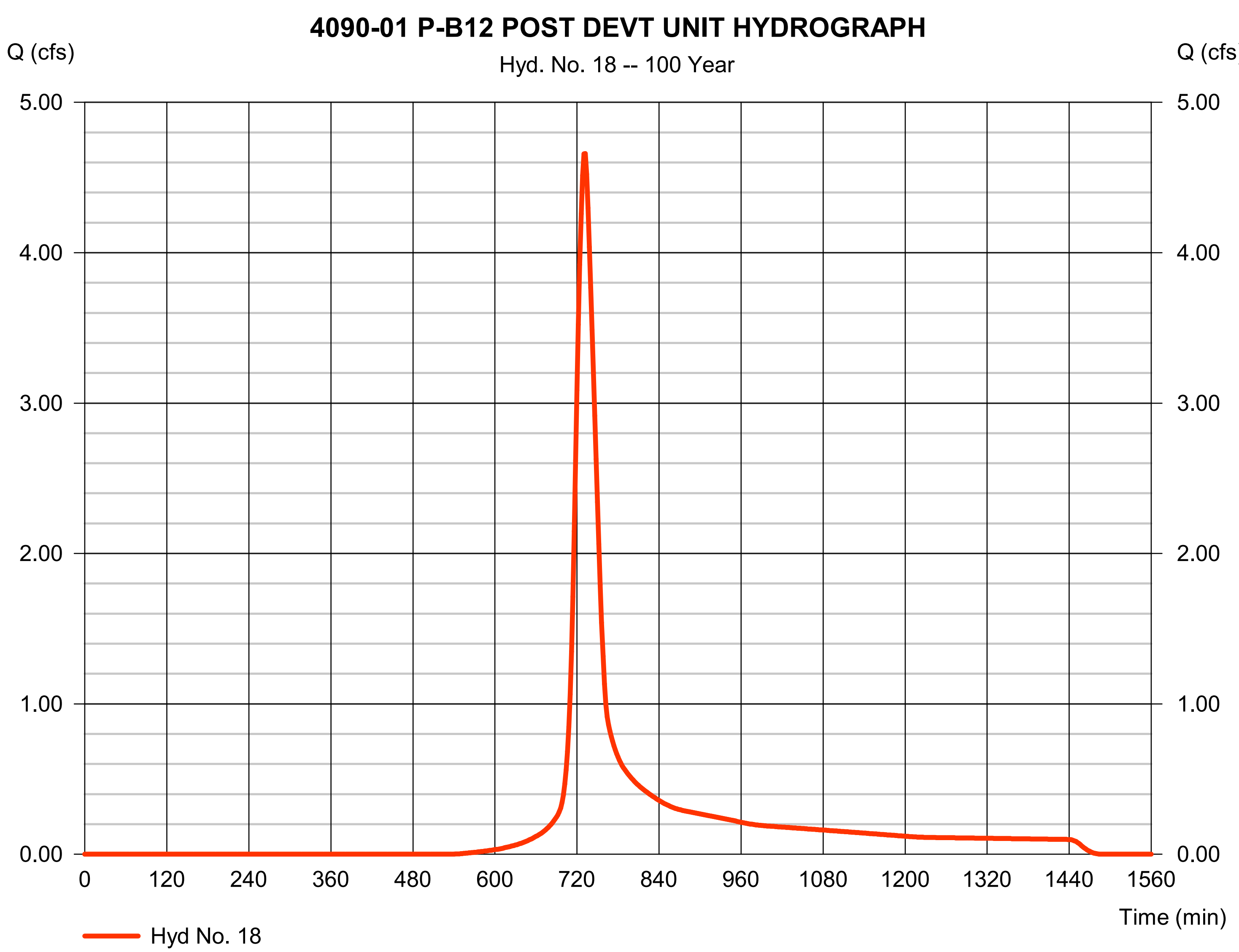
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 18

4090-01 P-B12 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 4.659 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 18,821 cuft
Drainage area	= 2.530 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 746 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.31 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

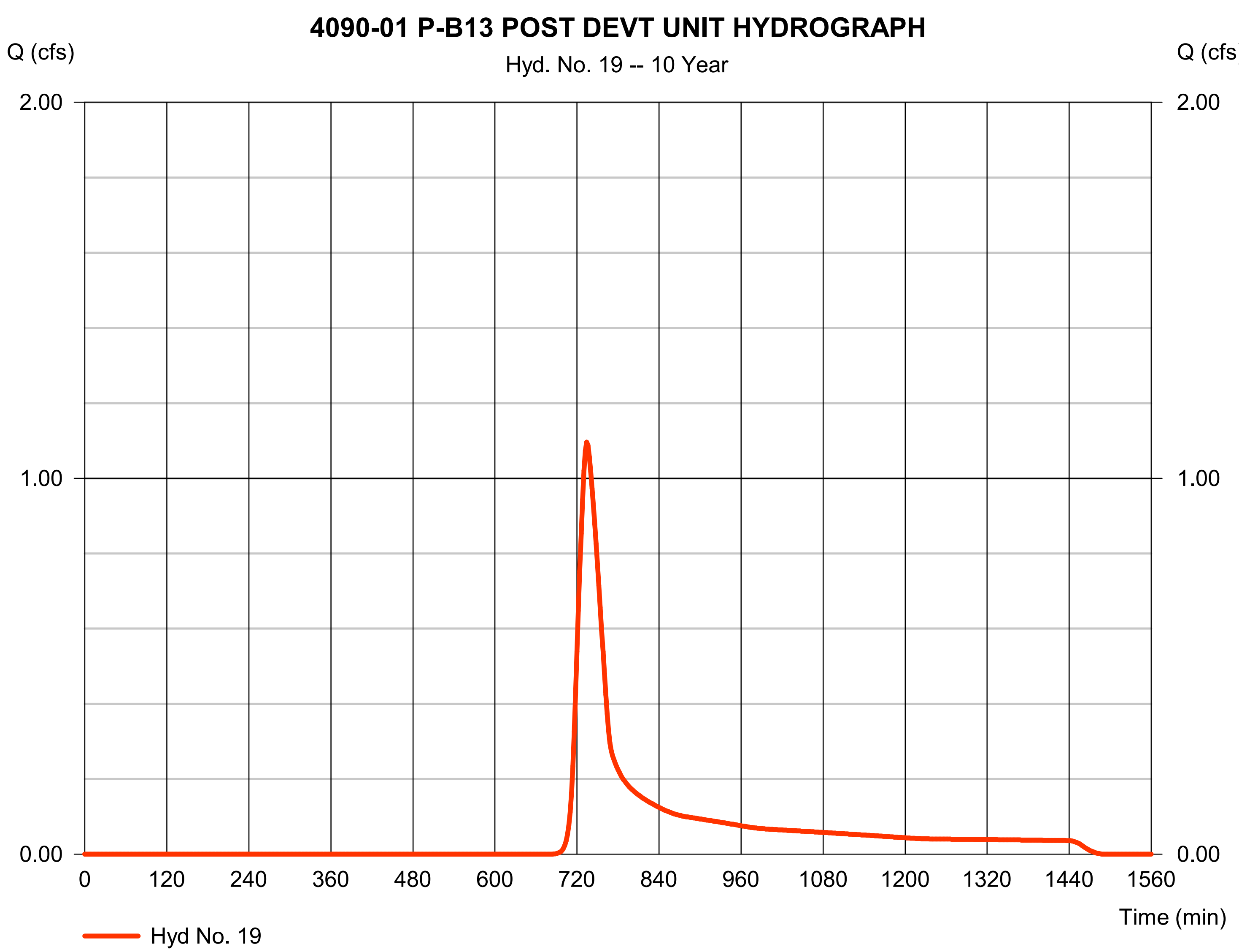
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 19

4090-01 P-B13 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.096 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 5,330 cuft
Drainage area	= 2.280 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 790 ft
Tc method	= LAG	Time of conc. (Tc)	= 31.33 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



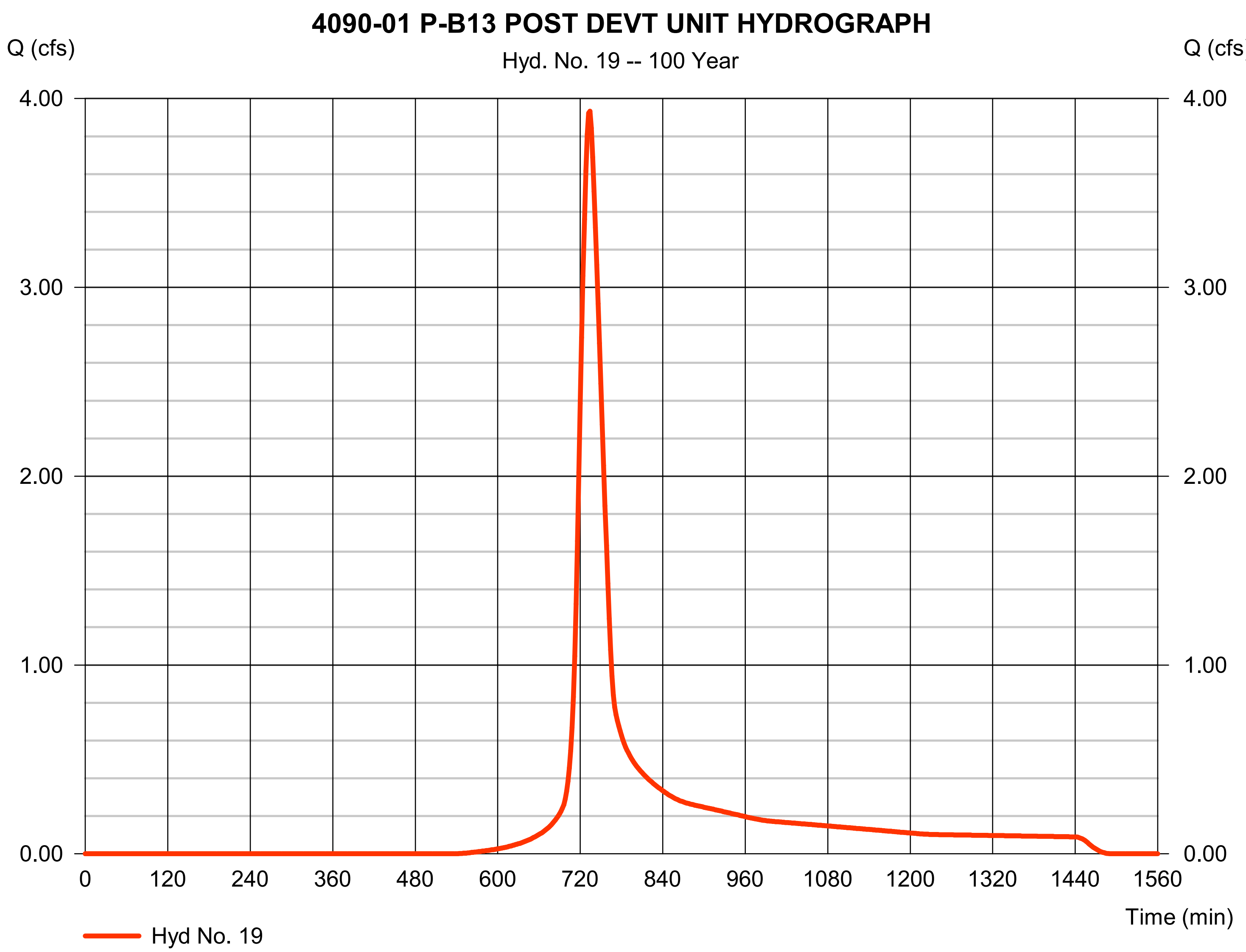
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 19

4090-01 P-B13 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.934 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 17,173 cuft
Drainage area	= 2.280 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 790 ft
Tc method	= LAG	Time of conc. (Tc)	= 31.33 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

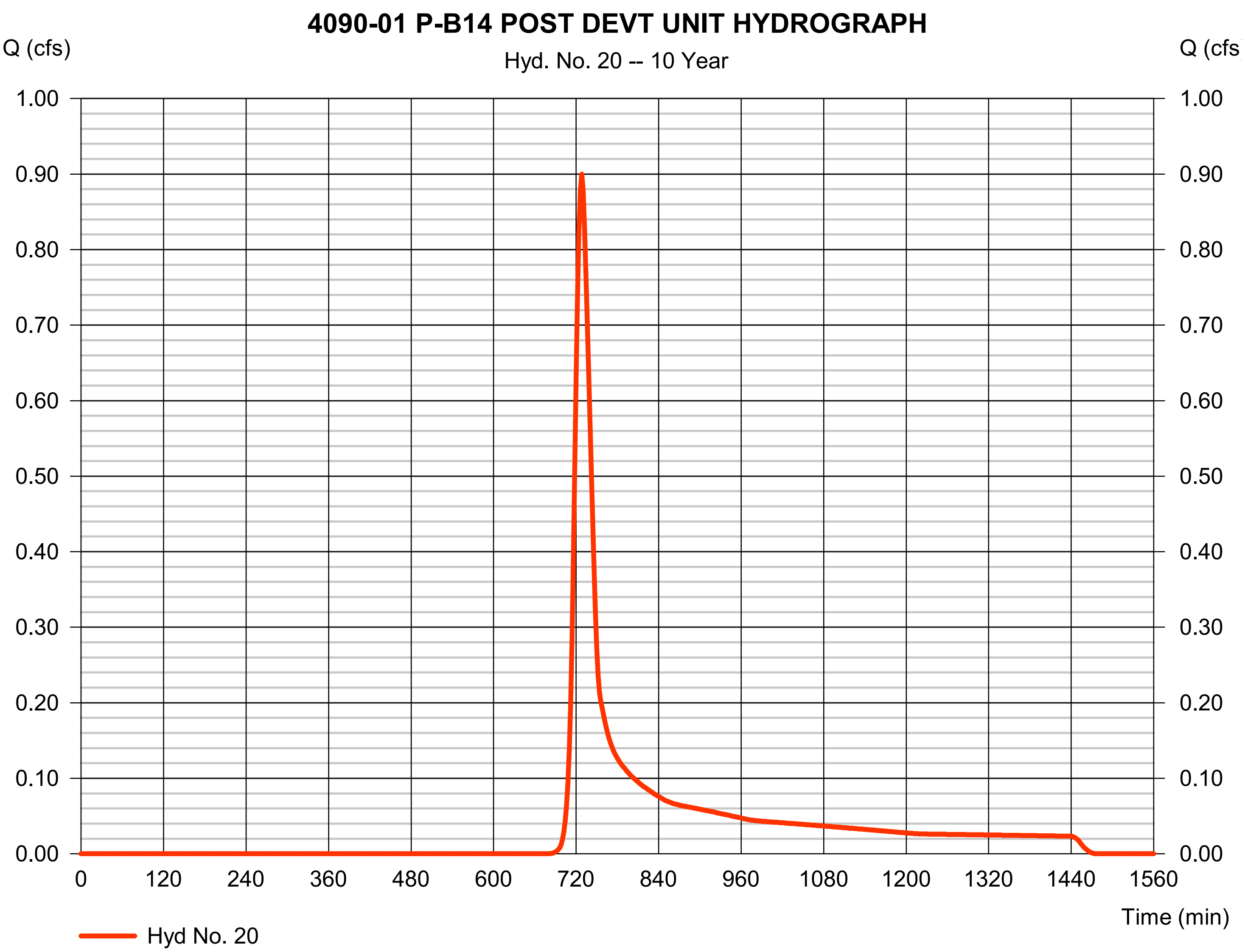
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 20

4090-01 P-B14 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.900 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 3,431 cuft
Drainage area	= 1.460 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 542 ft
Tc method	= LAG	Time of conc. (Tc)	= 22.65 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

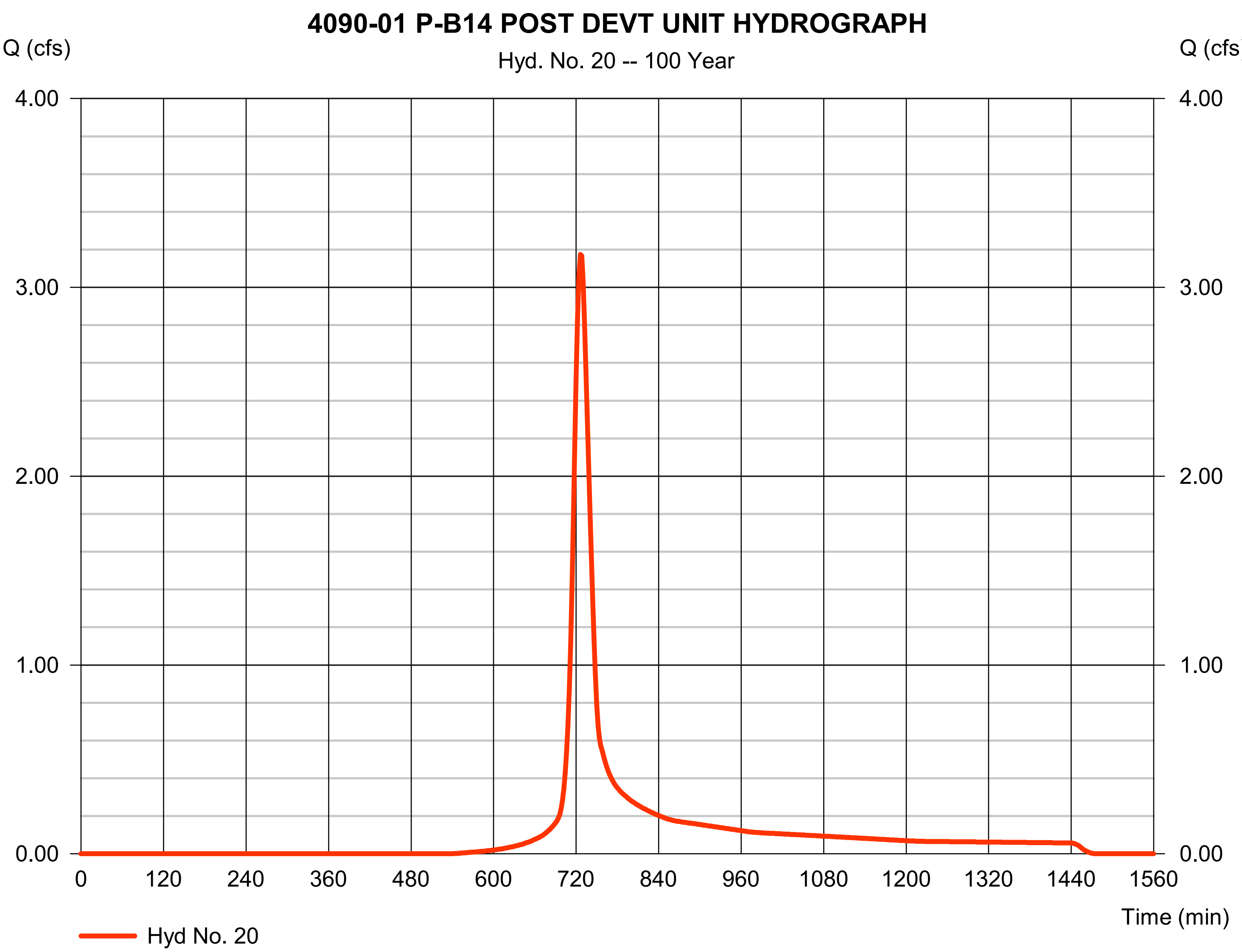


Hydrograph Report

Hyd. No. 20

4090-01 P-B14 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.174 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 11,055 cuft
Drainage area	= 1.460 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 542 ft
Tc method	= LAG	Time of conc. (Tc)	= 22.65 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

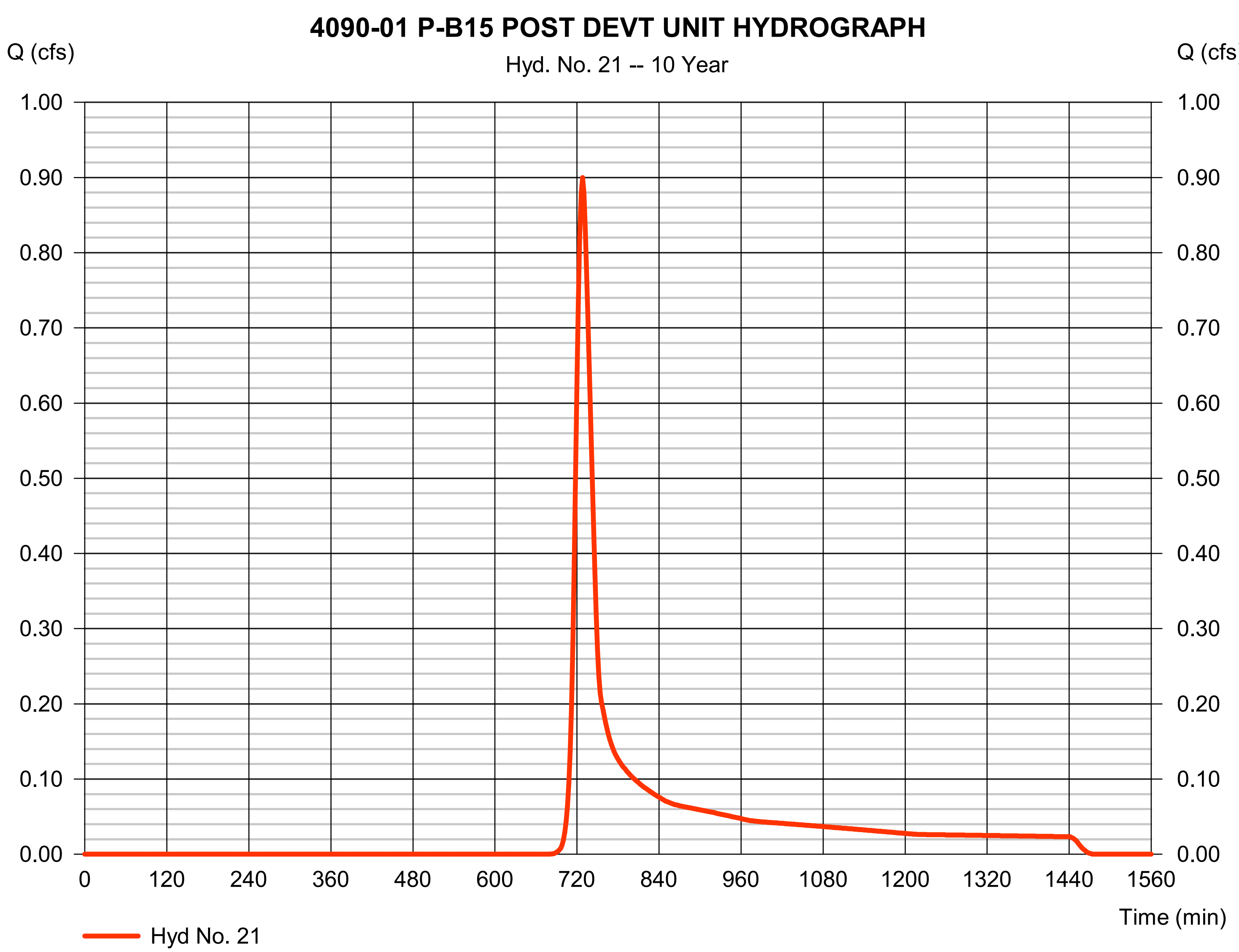
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 21

4090-01 P-B15 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.900 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 3,431 cuft
Drainage area	= 1.460 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 542 ft
Tc method	= LAG	Time of conc. (Tc)	= 22.65 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



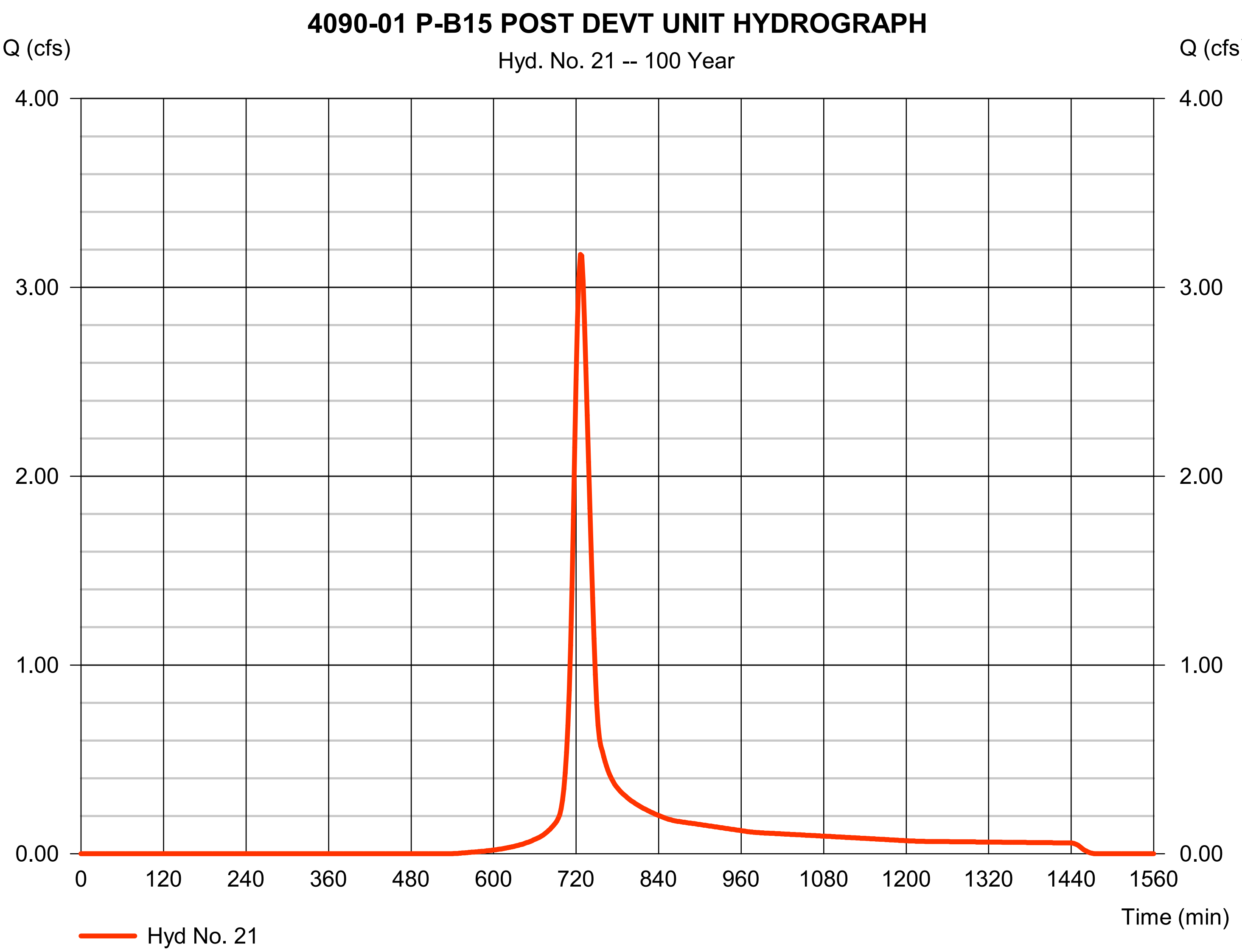
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 21

4090-01 P-B15 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 3.174 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 11,055 cuft
Drainage area	= 1.460 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 542 ft
Tc method	= LAG	Time of conc. (Tc)	= 22.65 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

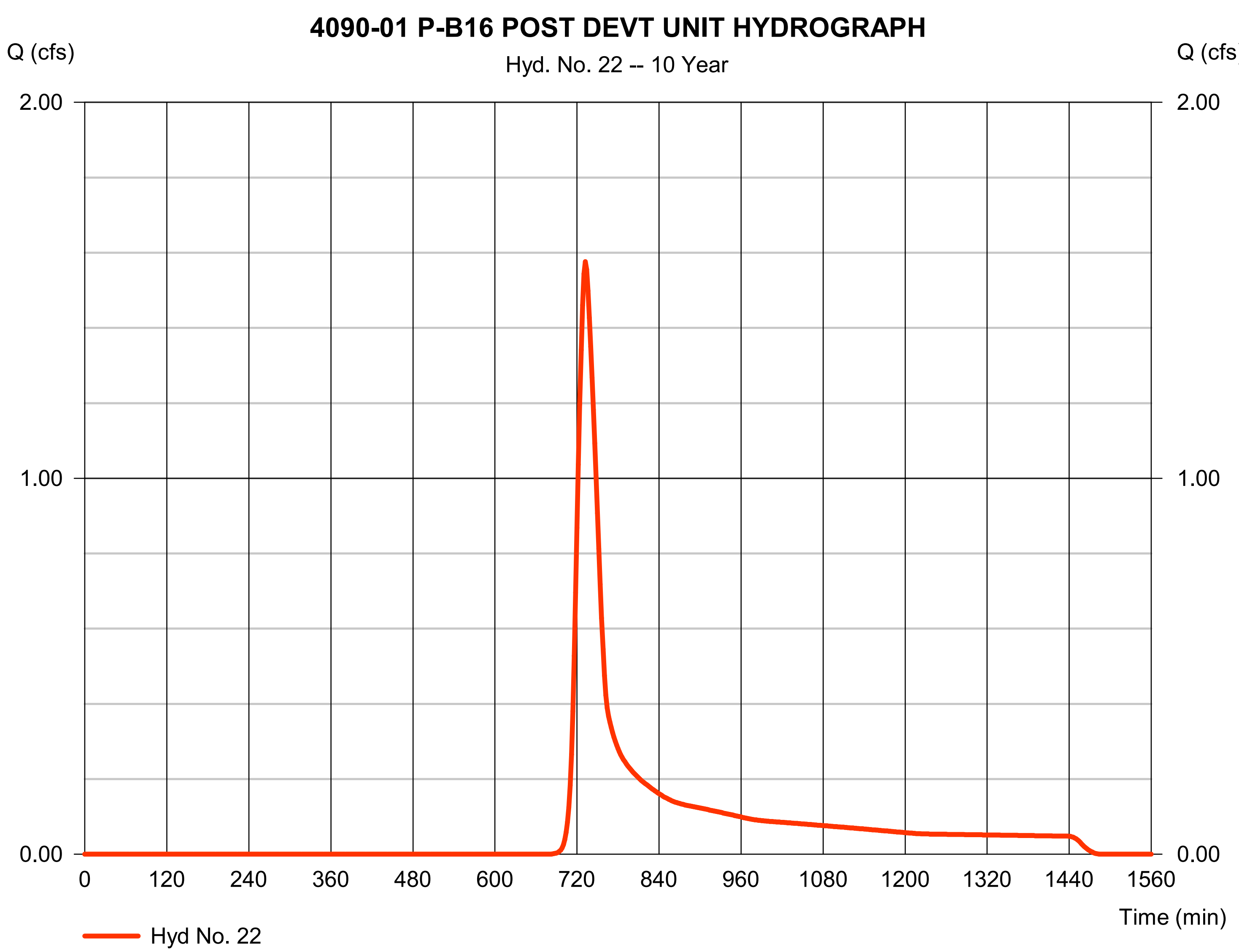
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 22

4090-01 P-B16 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 1.576 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 7,042 cuft
Drainage area	= 3.050 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 711 ft
Tc method	= LAG	Time of conc. (Tc)	= 29.32 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



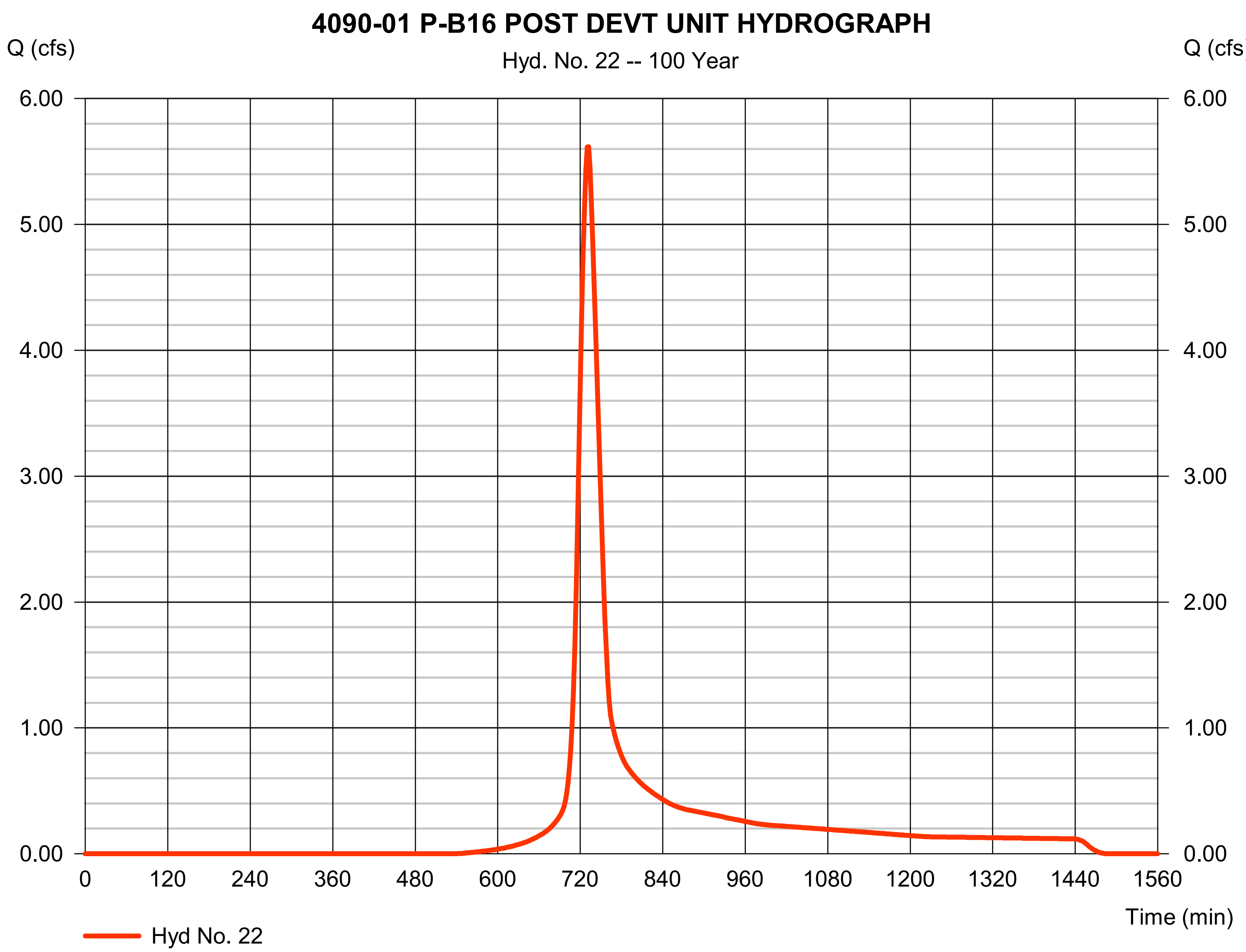
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 22

4090-01 P-B16 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 5.616 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 22,689 cuft
Drainage area	= 3.050 ac	Curve number	= 77
Basin Slope	= 0.8 %	Hydraulic length	= 711 ft
Tc method	= LAG	Time of conc. (Tc)	= 29.32 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

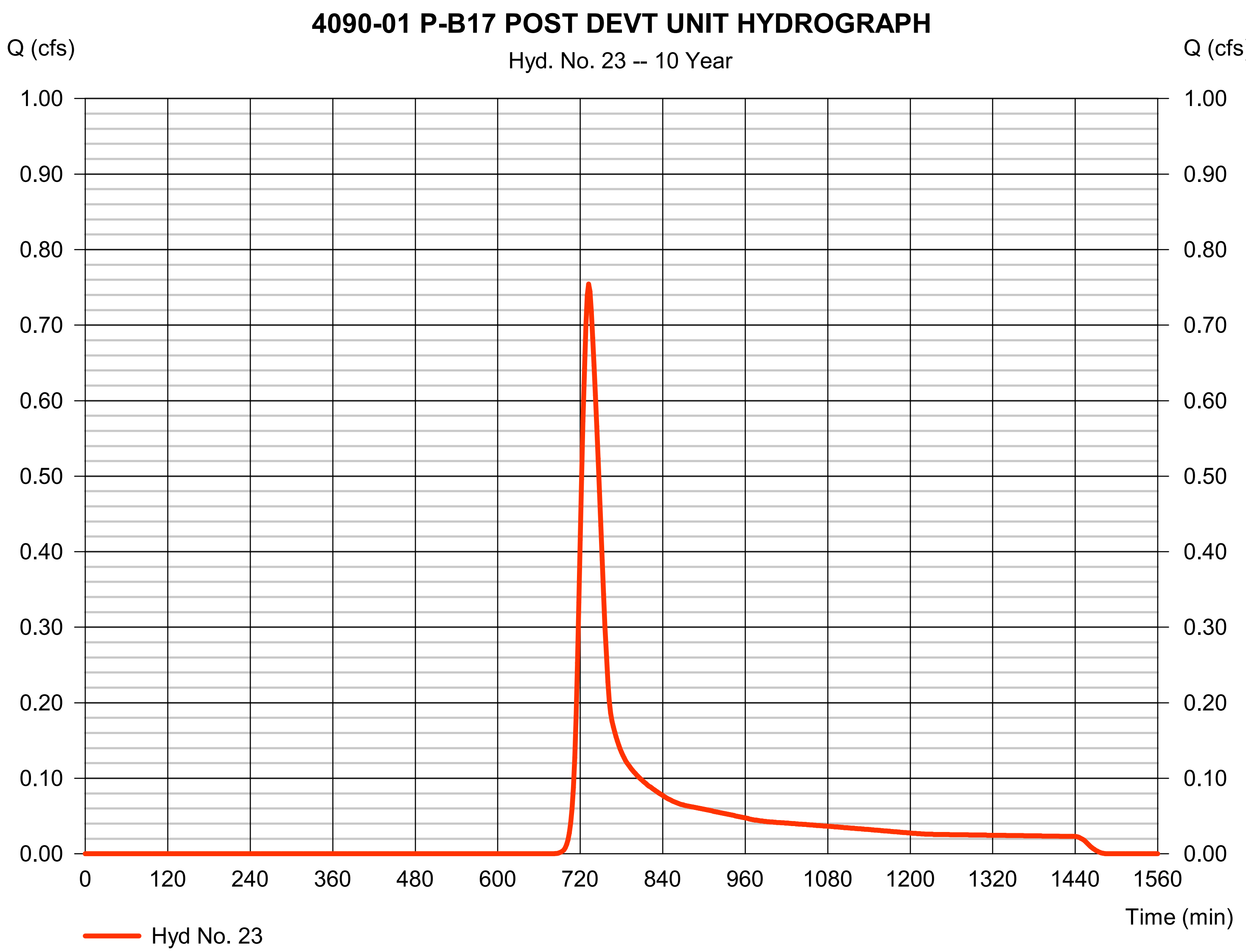
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 23

4090-01 P-B17 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 0.755 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 3,371 cuft
Drainage area	= 1.460 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 699 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.24 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



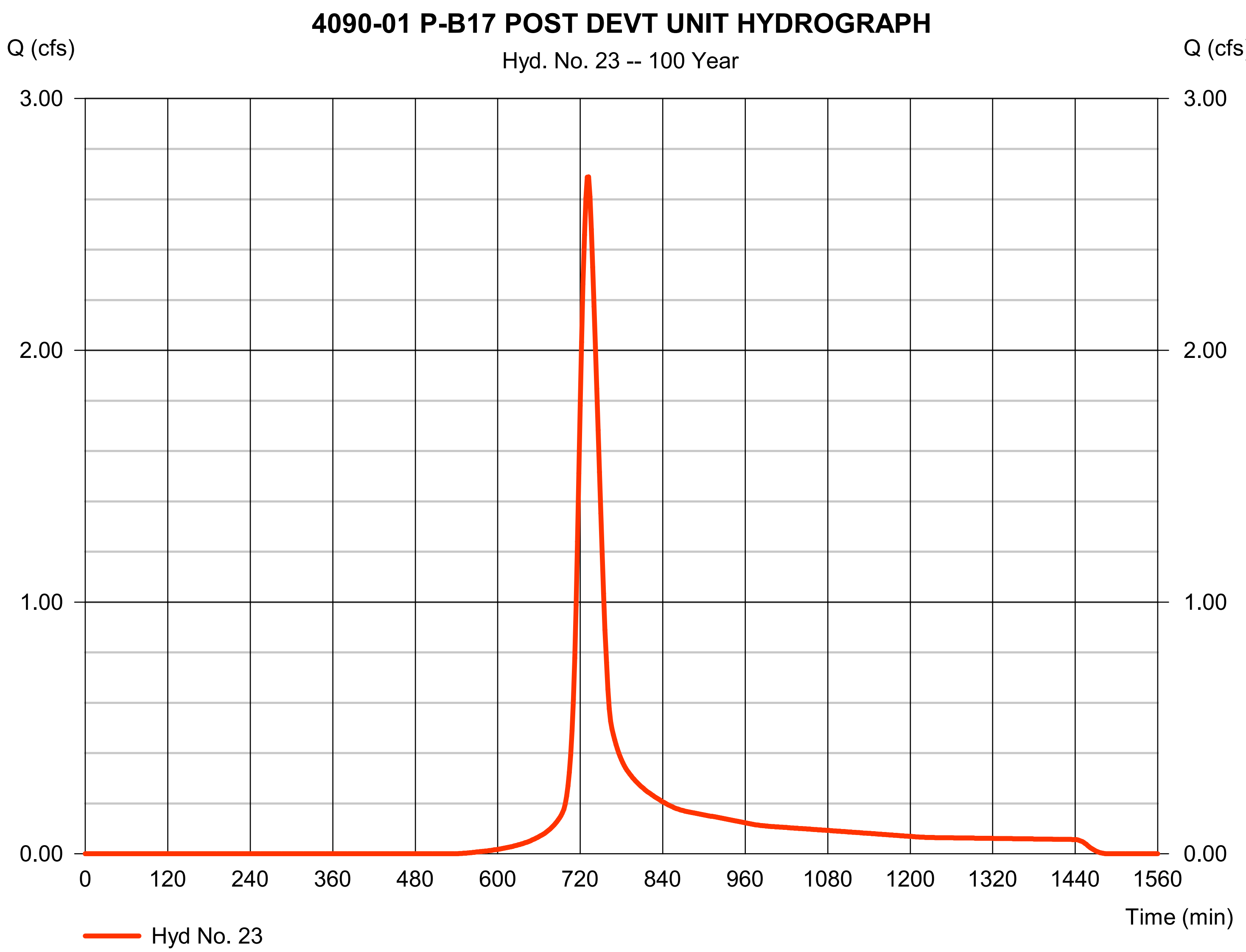
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 23

4090-01 P-B17 POST DEVT UNIT HYDROGRAPH

Hydrograph type	= SCS Runoff	Peak discharge	= 2.688 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 10,861 cuft
Drainage area	= 1.460 ac	Curve number	= 77
Basin Slope	= 0.9 %	Hydraulic length	= 699 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.24 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

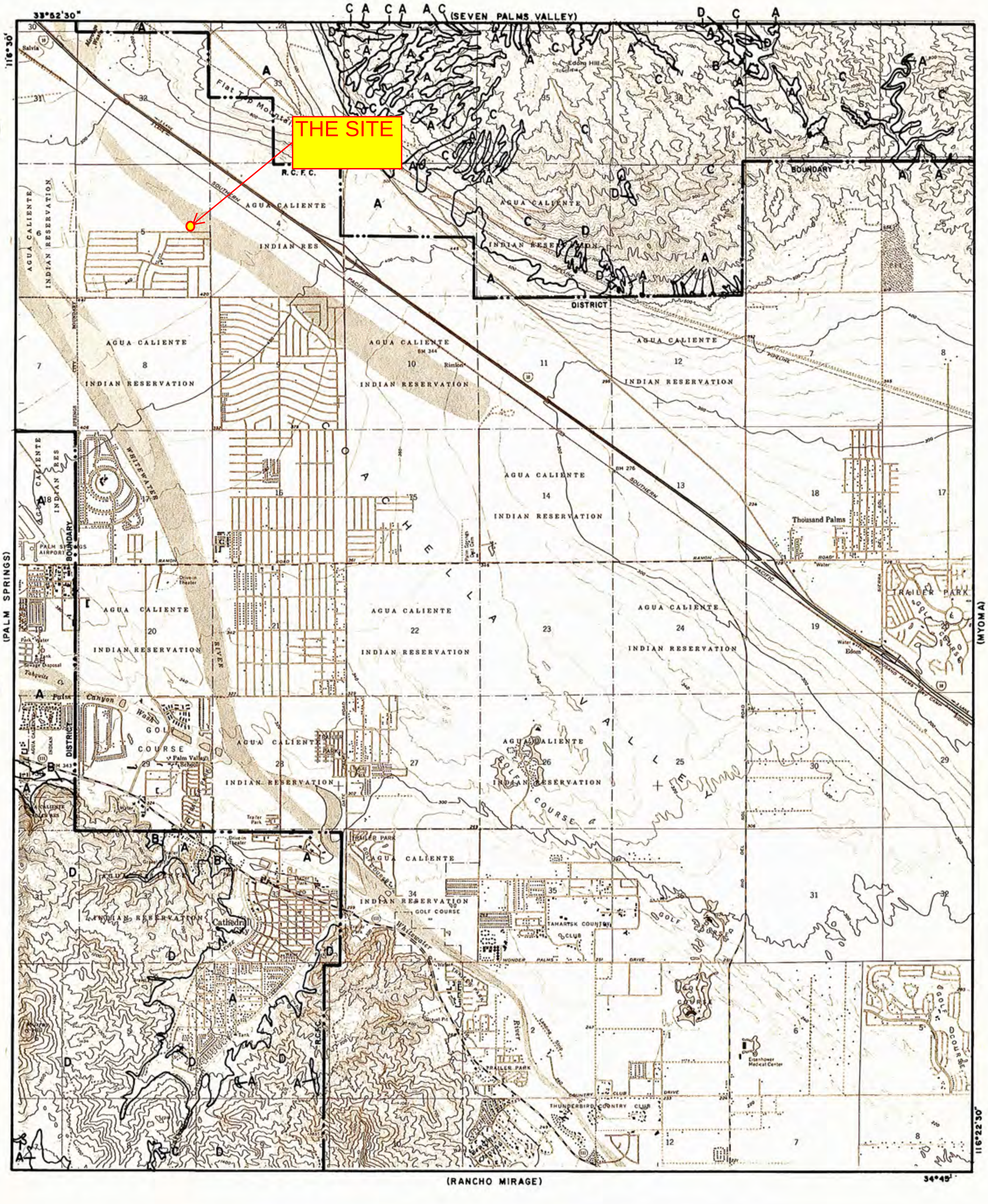
Tc = time in minutes. Values may exceed 60.

ne: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX 3

RCFC & WCD HYDROLOGIC SOIL MAP
(PLATE C-1.35)



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR CATHEDRAL CITY

PLATE C-1.36

Soil Map—Riverside County, Coachella Valley Area, California
(TTM 38711 & 38712-VERANO)

Map Scale: 1:3,170 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 45, 90, 180, 270

Feet: 0, 150, 300, 600, 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

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

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdC	Carsitas gravelly sand, 0 to 9 percent slopes	0.0	0.1%
ChC	Carsitas cobbly sand, 2 to 9 percent slopes	26.5	72.1%
CkB	Carsitas fine sand, 0 to 5 percent slopes	10.2	27.8%
Totals for Area of Interest		**36.7**	**100.0%**

Riverside County, Coachella Valley Area, California

CdC—Carsitas gravelly sand, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hkv0
Elevation: 800 feet
Mean annual precipitation: 4 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 275 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Carsitas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carsitas

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: gravelly sand
H2 - 10 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD200CA - Rarely Flooded Fans

Hydric soil rating: No

Minor Components

Myoma

Percent of map unit: 4 percent
Hydric soil rating: No

Riverwash

Percent of map unit: 4 percent
Landform: Channels
Hydric soil rating: Yes

Carsitas

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, stony or gravelly

Percent of map unit: 3 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

Riverside County, Coachella Valley Area, California

ChC—Carsitas cobbly sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hkv3
Elevation: 800 feet
Mean annual precipitation: 4 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Carsitas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carsitas

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: cobbly sand
H2 - 10 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD200CA - Rarely Flooded Fans

Hydric soil rating: No

Minor Components

Chuckawalla

Percent of map unit: 4 percent
Hydric soil rating: No

Riverwash

Percent of map unit: 4 percent
Landform: Channels
Hydric soil rating: Yes

Carrizo

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 3 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

Riverside County, Coachella Valley Area, California

CkB—Carsitas fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hkv4
Elevation: 800 feet
Mean annual precipitation: 4 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 275 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Carsitas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carsitas

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: fine sand
H2 - 10 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD200CA - Rarely Flooded Fans

Hydric soil rating: No

Minor Components

Myoma

Percent of map unit: 10 percent
Hydric soil rating: No

Coachella

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, gravel surface

Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 14, Sep 1, 2022

APPENDIX 4

HYDRAFLOW UNIT HYDROGRAPH CALCULATIONS
STORAGE REQUIREMENT, 100YR-24HR

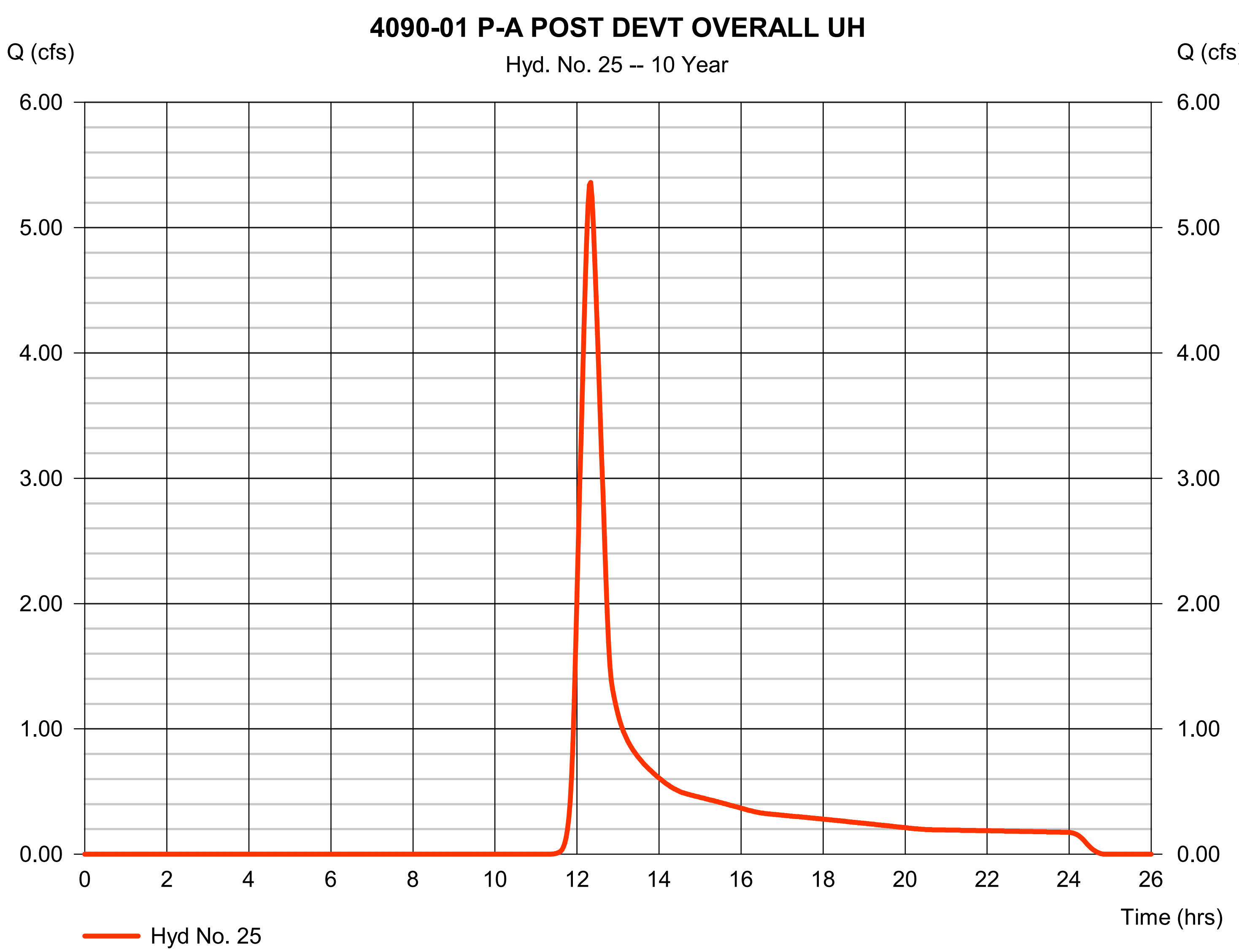
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Wednesday, 06 / 7 / 2023

Hyd. No. 25

4090-01 P-A POST DEVT OVERALL UH

Hydrograph type	= SCS Runoff	Peak discharge	= 5.360 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 25,638 cuft
Drainage area	= 11.130 ac	Curve number	= 77
Basin Slope	= 1.9 %	Hydraulic length	= 1961 ft
Tc method	= LAG	Time of conc. (Tc)	= 43.83 min
Total precip.	= 2.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 620



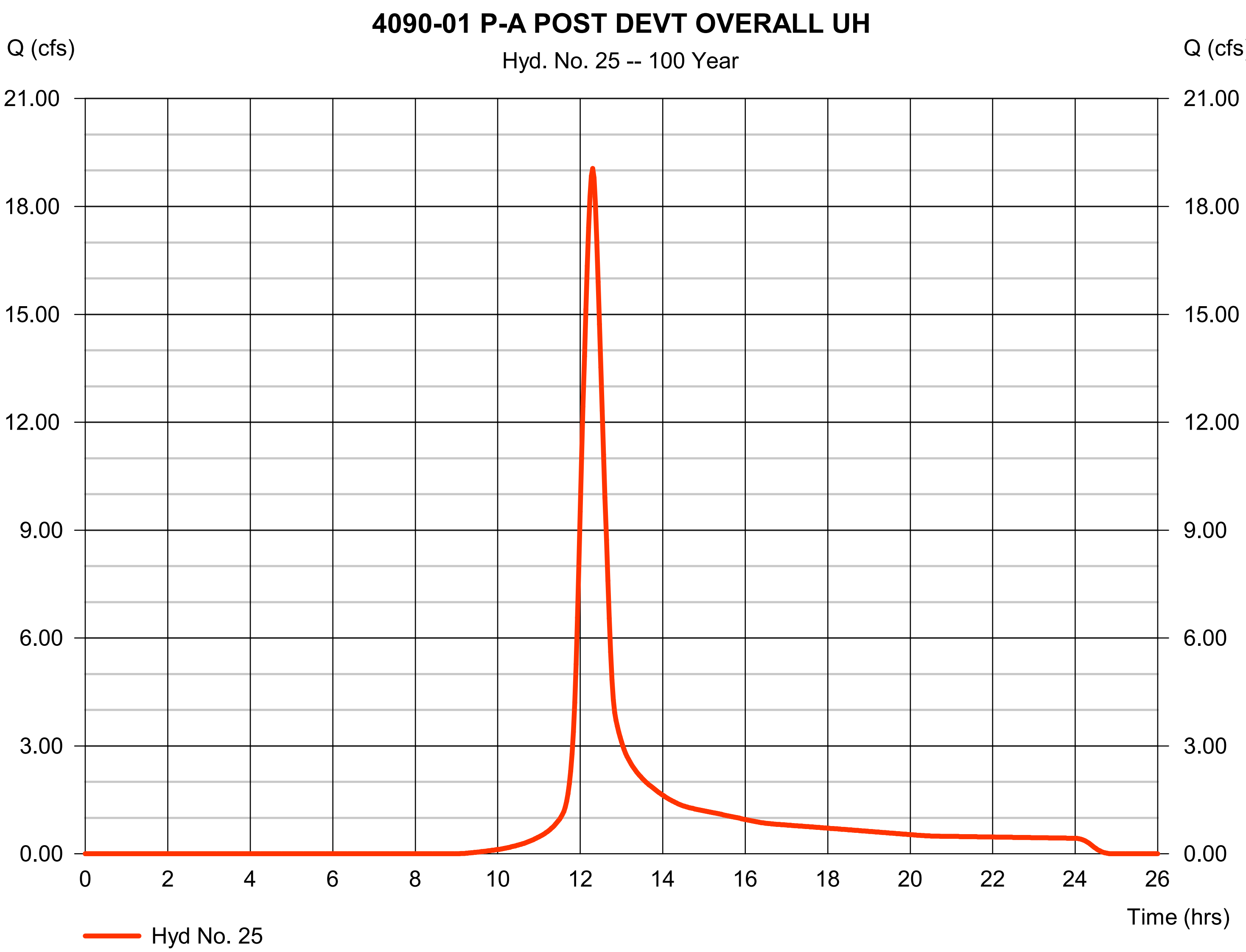
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 06 / 7 / 2023

Hyd. No. 25

4090-01 P-A POST DEVT OVERALL UH

Hydrograph type	= SCS Runoff	Peak discharge	= 19.05 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 82,606 cuft
Drainage area	= 11.130 ac	Curve number	= 77
Basin Slope	= 1.9 %	Hydraulic length	= 1961 ft
Tc method	= LAG	Time of conc. (Tc)	= 43.83 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 620



Hydrograph Report

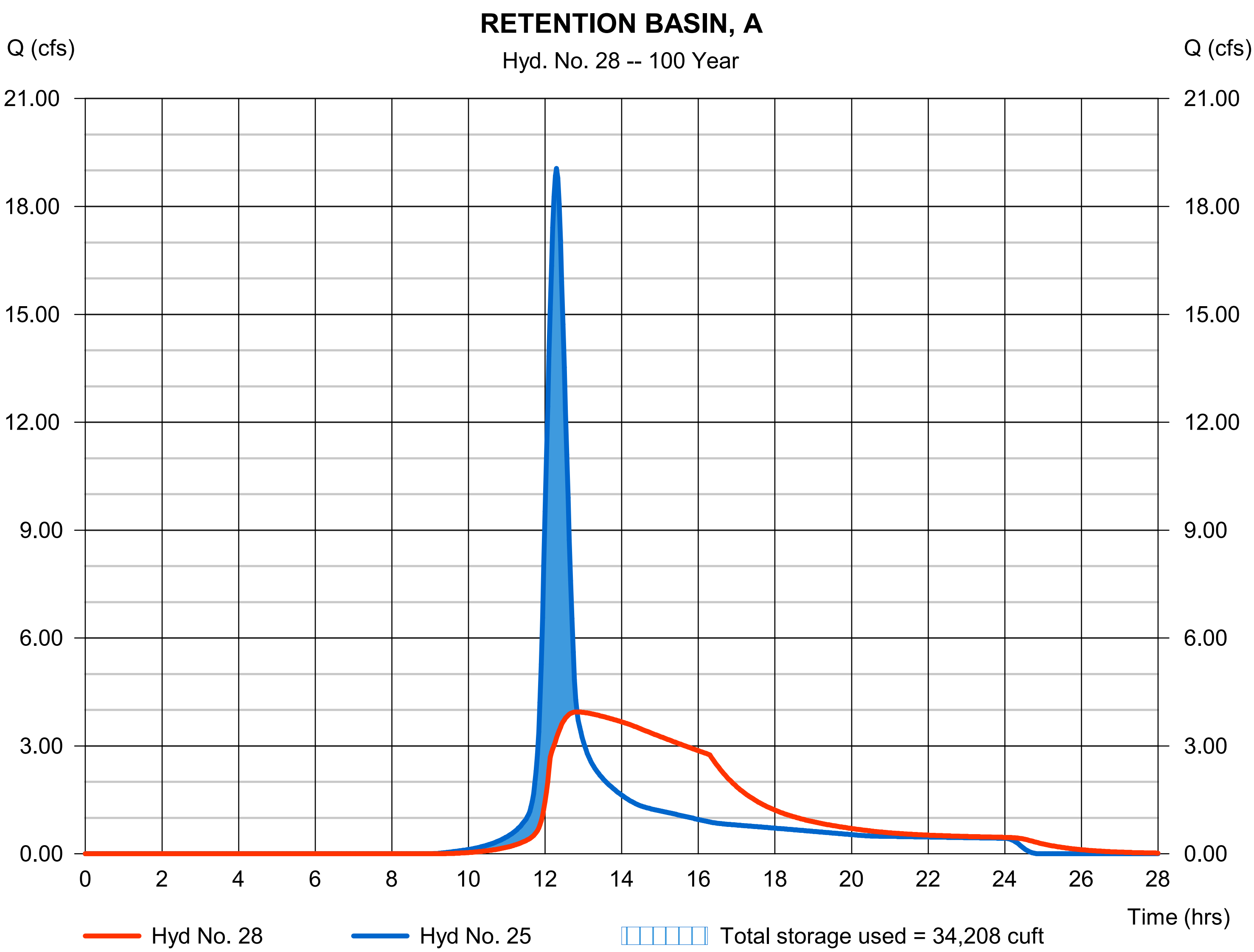
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 06 / 7 / 2023

Hyd. No. 28

RETENTION BASIN, A

Hydrograph type	= Reservoir	Peak discharge	= 3.944 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 82,602 cuft
Inflow hyd. No.	= 25 - 4090-01 P-A POST DEVT OVERALL UH	Max. Elevation	= 461.39 ft
Reservoir name	= RETENTION BASIN, A	Max. Storage	= 34,208 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond Report

Pond No. 2 - RETENTION BASIN, A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 459.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	459.00	9,349	0	0
1.00	460.00	13,312	11,271	11,271
2.00	461.00	17,404	15,311	26,582
3.00	462.00	21,623	19,473	46,055
4.00	463.00	25,971	23,761	69,817
5.00	464.00	30,446	28,176	97,993
6.00	465.00	35,050	32,718	130,711
7.00	466.00	39,781	37,387	168,098

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 459.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 8.940 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	459.00	---	---	---	---	---	---	---	---	0.000	---	0.000
0.10	1,127	459.10	---	---	---	---	---	---	---	---	0.275	---	0.275
0.20	2,254	459.20	---	---	---	---	---	---	---	---	0.551	---	0.551
0.30	3,381	459.30	---	---	---	---	---	---	---	---	0.826	---	0.826
0.40	4,508	459.40	---	---	---	---	---	---	---	---	1.102	---	1.102
0.50	5,636	459.50	---	---	---	---	---	---	---	---	1.377	---	1.377
0.60	6,763	459.60	---	---	---	---	---	---	---	---	1.653	---	1.653
0.70	7,890	459.70	---	---	---	---	---	---	---	---	1.928	---	1.928
0.80	9,017	459.80	---	---	---	---	---	---	---	---	2.204	---	2.204
0.90	10,144	459.90	---	---	---	---	---	---	---	---	2.479	---	2.479
1.00	11,271	460.00	---	---	---	---	---	---	---	---	2.755	---	2.755
1.10	12,802	460.10	---	---	---	---	---	---	---	---	2.840	---	2.840
1.20	14,333	460.20	---	---	---	---	---	---	---	---	2.924	---	2.924
1.30	15,864	460.30	---	---	---	---	---	---	---	---	3.009	---	3.009
1.40	17,396	460.40	---	---	---	---	---	---	---	---	3.094	---	3.094
1.50	18,927	460.50	---	---	---	---	---	---	---	---	3.178	---	3.178
1.60	20,458	460.60	---	---	---	---	---	---	---	---	3.263	---	3.263
1.70	21,989	460.70	---	---	---	---	---	---	---	---	3.348	---	3.348
1.80	23,520	460.80	---	---	---	---	---	---	---	---	3.432	---	3.432
1.90	25,051	460.90	---	---	---	---	---	---	---	---	3.517	---	3.517
2.00	26,582	461.00	---	---	---	---	---	---	---	---	3.602	---	3.602
2.10	28,529	461.10	---	---	---	---	---	---	---	---	3.689	---	3.689
2.20	30,477	461.20	---	---	---	---	---	---	---	---	3.776	---	3.776
2.30	32,424	461.30	---	---	---	---	---	---	---	---	3.864	---	3.864
2.40	34,371	461.40	---	---	---	---	---	---	---	---	3.951	---	3.951
2.50	36,319	461.50	---	---	---	---	---	---	---	---	4.038	---	4.038
2.60	38,266	461.60	---	---	---	---	---	---	---	---	4.125	---	4.125
2.70	40,213	461.70	---	---	---	---	---	---	---	---	4.213	---	4.213
2.80	42,161	461.80	---	---	---	---	---	---	---	---	4.300	---	4.300
2.90	44,108	461.90	---	---	---	---	---	---	---	---	4.387	---	4.387
3.00	46,055	462.00	---	---	---	---	---	---	---	---	4.475	---	4.475
3.10	48,432	462.10	---	---	---	---	---	---	---	---	4.565	---	4.565
3.20	50,808	462.20	---	---	---	---	---	---	---	---	4.655	---	4.655
3.30	53,184	462.30	---	---	---	---	---	---	---	---	4.745	---	4.745
3.40	55,560	462.40	---	---	---	---	---	---	---	---	4.835	---	4.835

Continues on next page...

RETENTION BASIN, A

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.50	57,936	462.50	---	---	---	---	---	---	---	---	4.925	---	4.925
3.60	60,312	462.60	---	---	---	---	---	---	---	---	5.015	---	5.015
3.70	62,688	462.70	---	---	---	---	---	---	---	---	5.105	---	5.105
3.80	65,065	462.80	---	---	---	---	---	---	---	---	5.195	---	5.195
3.90	67,441	462.90	---	---	---	---	---	---	---	---	5.285	---	5.285
4.00	69,817	463.00	---	---	---	---	---	---	---	---	5.375	---	5.375
4.10	72,635	463.10	---	---	---	---	---	---	---	---	5.467	---	5.467
4.20	75,452	463.20	---	---	---	---	---	---	---	---	5.560	---	5.560
4.30	78,270	463.30	---	---	---	---	---	---	---	---	5.652	---	5.652
4.40	81,087	463.40	---	---	---	---	---	---	---	---	5.745	---	5.745
4.50	83,905	463.50	---	---	---	---	---	---	---	---	5.838	---	5.838
4.60	86,723	463.60	---	---	---	---	---	---	---	---	5.930	---	5.930
4.70	89,540	463.70	---	---	---	---	---	---	---	---	6.023	---	6.023
4.80	92,358	463.80	---	---	---	---	---	---	---	---	6.115	---	6.115
4.90	95,175	463.90	---	---	---	---	---	---	---	---	6.208	---	6.208
5.00	97,993	464.00	---	---	---	---	---	---	---	---	6.301	---	6.301
5.10	101,265	464.10	---	---	---	---	---	---	---	---	6.396	---	6.396
5.20	104,537	464.20	---	---	---	---	---	---	---	---	6.491	---	6.491
5.30	107,808	464.30	---	---	---	---	---	---	---	---	6.586	---	6.586
5.40	111,080	464.40	---	---	---	---	---	---	---	---	6.682	---	6.682
5.50	114,352	464.50	---	---	---	---	---	---	---	---	6.777	---	6.777
5.60	117,624	464.60	---	---	---	---	---	---	---	---	6.872	---	6.872
5.70	120,895	464.70	---	---	---	---	---	---	---	---	6.968	---	6.968
5.80	124,167	464.80	---	---	---	---	---	---	---	---	7.063	---	7.063
5.90	127,439	464.90	---	---	---	---	---	---	---	---	7.158	---	7.158
6.00	130,711	465.00	---	---	---	---	---	---	---	---	7.253	---	7.253
6.10	134,449	465.10	---	---	---	---	---	---	---	---	7.351	---	7.351
6.20	138,188	465.20	---	---	---	---	---	---	---	---	7.449	---	7.449
6.30	141,927	465.30	---	---	---	---	---	---	---	---	7.547	---	7.547
6.40	145,665	465.40	---	---	---	---	---	---	---	---	7.645	---	7.645
6.50	149,404	465.50	---	---	---	---	---	---	---	---	7.743	---	7.743
6.60	153,143	465.60	---	---	---	---	---	---	---	---	7.841	---	7.841
6.70	156,882	465.70	---	---	---	---	---	---	---	---	7.939	---	7.939
6.80	160,620	465.80	---	---	---	---	---	---	---	---	8.037	---	8.037
6.90	164,359	465.90	---	---	---	---	---	---	---	---	8.134	---	8.134
7.00	168,098	466.00	---	---	---	---	---	---	---	---	8.232	---	8.232

...End

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 06 / 7 / 2023

Hyd. No. 28

RETENTION BASIN, A

Hydrograph type	= Reservoir	Peak discharge	= 3.944 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 82,602 cuft
Inflow hyd. No.	= 25 - 4090-01 P-A POST DEV T OVERALL UH	Reservoir name	= RETENTION BASIN,
Max. Elevation	= 461.39 ft	Max. Storage	= 34,208 cuft

Storage Indication method used. Outflow includes exfiltration.

Hydrograph Discharge Table

(Printed values >= 1.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
10.07	0.132	459.01	-----	-----	-----	-----	-----	-----	-----	-----	0.040	0.039
10.10	0.139	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.042	0.042
10.13	0.146	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.045	0.045
10.17	0.153	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.048	0.048
10.20	0.161	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.051	0.051
10.23	0.168	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.055	0.055
10.27	0.177	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.058	0.058
10.30	0.185	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.062	0.062
10.33	0.194	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.065	0.065
10.37	0.203	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.069	0.069
10.40	0.213	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.073	0.073
10.43	0.223	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.077	0.077
10.47	0.233	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.082	0.082
10.50	0.244	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.086	0.086
10.53	0.255	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.091	0.091
10.57	0.267	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.096	0.096
10.60	0.279	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.101	0.101
10.63	0.291	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.106	0.106
10.67	0.304	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.112	0.112
10.70	0.318	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.118	0.118

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
10.73	0.332	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.123	0.123
10.77	0.347	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.130	0.130
10.80	0.362	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.136	0.136
10.83	0.378	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.143	0.143
10.87	0.395	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.150	0.150
10.90	0.413	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.157	0.157
10.93	0.431	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.165	0.165
10.97	0.450	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.173	0.173
11.00	0.471	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.181	0.181
11.03	0.492	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.190	0.190
11.07	0.514	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.199	0.199
11.10	0.537	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.208	0.208
11.13	0.561	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.218	0.218
11.17	0.587	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.229	0.229
11.20	0.615	459.09	-----	-----	-----	-----	-----	-----	-----	-----	0.239	0.239
11.23	0.644	459.09	-----	-----	-----	-----	-----	-----	-----	-----	0.251	0.251
11.27	0.675	459.10	-----	-----	-----	-----	-----	-----	-----	-----	0.262	0.262
11.30	0.709	459.10	-----	-----	-----	-----	-----	-----	-----	-----	0.275	0.275
11.33	0.744	459.10	-----	-----	-----	-----	-----	-----	-----	-----	0.288	0.288
11.37	0.782	459.11	-----	-----	-----	-----	-----	-----	-----	-----	0.302	0.302
11.40	0.823	459.11	-----	-----	-----	-----	-----	-----	-----	-----	0.316	0.316
11.43	0.867	459.12	-----	-----	-----	-----	-----	-----	-----	-----	0.331	0.331
11.47	0.913	459.13	-----	-----	-----	-----	-----	-----	-----	-----	0.348	0.348
11.50	0.963	459.13	-----	-----	-----	-----	-----	-----	-----	-----	0.365	0.365
11.53	1.018	459.14	-----	-----	-----	-----	-----	-----	-----	-----	0.383	0.383
11.57	1.087	459.15	-----	-----	-----	-----	-----	-----	-----	-----	0.402	0.402
11.60	1.178	459.15	-----	-----	-----	-----	-----	-----	-----	-----	0.423	0.423
11.63	1.298	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.447	0.447

Continues on next page...

RETENTION BASIN, A

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
11.67	1.459	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.474	0.474
11.70	1.671	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.505	0.505
11.73	1.946	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.543	0.543
11.77	2.301	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.589	0.589
11.80	2.769	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.645	0.645
11.83	3.388	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.715	0.715
11.87	4.205	459.29	-----	-----	-----	-----	-----	-----	-----	-----	0.804	0.804
11.90	5.268	459.33	-----	-----	-----	-----	-----	-----	-----	-----	0.918	0.918
11.93	6.568	459.39	-----	-----	-----	-----	-----	-----	-----	-----	1.063	1.062
11.97	8.018	459.45	-----	-----	-----	-----	-----	-----	-----	-----	1.243	1.243
12.00	9.514	459.53	-----	-----	-----	-----	-----	-----	-----	-----	1.460	1.460
12.03	11.00	459.62	-----	-----	-----	-----	-----	-----	-----	-----	1.714	1.714
12.07	12.44	459.73	-----	-----	-----	-----	-----	-----	-----	-----	2.003	2.003
12.10	13.83	459.84	-----	-----	-----	-----	-----	-----	-----	-----	2.325	2.325
12.13	15.14	459.97	-----	-----	-----	-----	-----	-----	-----	-----	2.677	2.677
12.17	16.34	460.08	-----	-----	-----	-----	-----	-----	-----	-----	2.823	2.823
12.20	17.41	460.19	-----	-----	-----	-----	-----	-----	-----	-----	2.916	2.916
12.23	18.27	460.31	-----	-----	-----	-----	-----	-----	-----	-----	3.015	3.015
12.27	18.85	460.43	-----	-----	-----	-----	-----	-----	-----	-----	3.118	3.118
12.30	19.05 <<	460.55	-----	-----	-----	-----	-----	-----	-----	-----	3.223	3.223
12.33	18.79	460.68	-----	-----	-----	-----	-----	-----	-----	-----	3.326	3.326
12.37	18.07	460.79	-----	-----	-----	-----	-----	-----	-----	-----	3.426	3.426
12.40	17.05	460.90	-----	-----	-----	-----	-----	-----	-----	-----	3.520	3.520
12.43	15.91	461.00	-----	-----	-----	-----	-----	-----	-----	-----	3.605	3.605
12.47	14.73	461.08	-----	-----	-----	-----	-----	-----	-----	-----	3.668	3.668
12.50	13.53	461.14	-----	-----	-----	-----	-----	-----	-----	-----	3.724	3.724
12.53	12.31	461.20	-----	-----	-----	-----	-----	-----	-----	-----	3.773	3.773
12.57	11.10	461.25	-----	-----	-----	-----	-----	-----	-----	-----	3.816	3.816

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.60	9.899	461.29	-----	-----	-----	-----	-----	-----	-----	-----	3.852	3.852
12.63	8.725	461.32	-----	-----	-----	-----	-----	-----	-----	-----	3.881	3.881
12.67	7.596	461.35	-----	-----	-----	-----	-----	-----	-----	-----	3.904	3.904
12.70	6.544	461.37	-----	-----	-----	-----	-----	-----	-----	-----	3.921	3.921
12.73	5.611	461.38	-----	-----	-----	-----	-----	-----	-----	-----	3.932	3.932
12.77	4.839	461.39	-----	-----	-----	-----	-----	-----	-----	-----	3.939	3.939
12.80	4.280	461.39	-----	-----	-----	-----	-----	-----	-----	-----	3.943	3.943
12.83	3.926	461.39 <<	-----	-----	-----	-----	-----	-----	-----	-----	3.944	3.944 <<
12.87	3.706	461.39	-----	-----	-----	-----	-----	-----	-----	-----	3.943	3.943
12.90	3.539	461.39	-----	-----	-----	-----	-----	-----	-----	-----	3.941	3.941
12.93	3.385	461.39	-----	-----	-----	-----	-----	-----	-----	-----	3.939	3.939
12.97	3.244	461.38	-----	-----	-----	-----	-----	-----	-----	-----	3.935	3.935
13.00	3.116	461.38	-----	-----	-----	-----	-----	-----	-----	-----	3.931	3.931
13.03	2.999	461.37	-----	-----	-----	-----	-----	-----	-----	-----	3.926	3.926
13.07	2.893	461.37	-----	-----	-----	-----	-----	-----	-----	-----	3.921	3.921
13.10	2.796	461.36	-----	-----	-----	-----	-----	-----	-----	-----	3.915	3.915
13.13	2.708	461.35	-----	-----	-----	-----	-----	-----	-----	-----	3.909	3.909
13.17	2.629	461.34	-----	-----	-----	-----	-----	-----	-----	-----	3.903	3.903
13.20	2.557	461.34	-----	-----	-----	-----	-----	-----	-----	-----	3.896	3.896
13.23	2.491	461.33	-----	-----	-----	-----	-----	-----	-----	-----	3.888	3.888
13.27	2.431	461.32	-----	-----	-----	-----	-----	-----	-----	-----	3.881	3.881
13.30	2.376	461.31	-----	-----	-----	-----	-----	-----	-----	-----	3.873	3.873
13.33	2.325	461.30	-----	-----	-----	-----	-----	-----	-----	-----	3.864	3.864
13.37	2.276	461.29	-----	-----	-----	-----	-----	-----	-----	-----	3.856	3.856
13.40	2.230	461.28	-----	-----	-----	-----	-----	-----	-----	-----	3.847	3.847
13.43	2.186	461.27	-----	-----	-----	-----	-----	-----	-----	-----	3.839	3.839
13.47	2.143	461.26	-----	-----	-----	-----	-----	-----	-----	-----	3.830	3.830

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
13.50	2.103	461.25	-----	-----	-----	-----	-----	-----	-----	-----	3.820	3.820
13.53	2.063	461.24	-----	-----	-----	-----	-----	-----	-----	-----	3.811	3.811
13.57	2.026	461.23	-----	-----	-----	-----	-----	-----	-----	-----	3.802	3.802
13.60	1.989	461.22	-----	-----	-----	-----	-----	-----	-----	-----	3.792	3.792
13.63	1.954	461.21	-----	-----	-----	-----	-----	-----	-----	-----	3.782	3.782
13.67	1.920	461.20	-----	-----	-----	-----	-----	-----	-----	-----	3.772	3.772
13.70	1.888	461.18	-----	-----	-----	-----	-----	-----	-----	-----	3.762	3.762
13.73	1.856	461.17	-----	-----	-----	-----	-----	-----	-----	-----	3.752	3.752
13.77	1.825	461.16	-----	-----	-----	-----	-----	-----	-----	-----	3.742	3.742
13.80	1.796	461.15	-----	-----	-----	-----	-----	-----	-----	-----	3.732	3.732
13.83	1.767	461.14	-----	-----	-----	-----	-----	-----	-----	-----	3.721	3.721
13.87	1.738	461.12	-----	-----	-----	-----	-----	-----	-----	-----	3.711	3.711
13.90	1.711	461.11	-----	-----	-----	-----	-----	-----	-----	-----	3.700	3.700
13.93	1.684	461.10	-----	-----	-----	-----	-----	-----	-----	-----	3.689	3.689
13.97	1.657	461.09	-----	-----	-----	-----	-----	-----	-----	-----	3.678	3.678
14.00	1.631	461.08	-----	-----	-----	-----	-----	-----	-----	-----	3.667	3.667
14.03	1.606	461.06	-----	-----	-----	-----	-----	-----	-----	-----	3.656	3.656
14.07	1.581	461.05	-----	-----	-----	-----	-----	-----	-----	-----	3.645	3.645
14.10	1.557	461.04	-----	-----	-----	-----	-----	-----	-----	-----	3.634	3.634
14.13	1.533	461.02	-----	-----	-----	-----	-----	-----	-----	-----	3.623	3.623
14.17	1.511	461.01	-----	-----	-----	-----	-----	-----	-----	-----	3.612	3.612
14.20	1.489	461.00	-----	-----	-----	-----	-----	-----	-----	-----	3.600	3.600
14.23	1.467	460.98	-----	-----	-----	-----	-----	-----	-----	-----	3.586	3.586
14.27	1.447	460.97	-----	-----	-----	-----	-----	-----	-----	-----	3.572	3.572
14.30	1.427	460.95	-----	-----	-----	-----	-----	-----	-----	-----	3.558	3.558
14.33	1.409	460.93	-----	-----	-----	-----	-----	-----	-----	-----	3.544	3.544
14.37	1.391	460.91	-----	-----	-----	-----	-----	-----	-----	-----	3.530	3.530
14.40	1.375	460.90	-----	-----	-----	-----	-----	-----	-----	-----	3.515	3.515

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
14.43	1.359	460.88	-----	-----	-----	-----	-----	-----	-----	-----	3.501	3.501
14.47	1.345	460.86	-----	-----	-----	-----	-----	-----	-----	-----	3.487	3.487
14.50	1.331	460.85	-----	-----	-----	-----	-----	-----	-----	-----	3.473	3.473
14.53	1.319	460.83	-----	-----	-----	-----	-----	-----	-----	-----	3.458	3.458
14.57	1.307	460.81	-----	-----	-----	-----	-----	-----	-----	-----	3.444	3.444
14.60	1.296	460.80	-----	-----	-----	-----	-----	-----	-----	-----	3.430	3.430
14.63	1.286	460.78	-----	-----	-----	-----	-----	-----	-----	-----	3.416	3.416
14.67	1.276	460.76	-----	-----	-----	-----	-----	-----	-----	-----	3.402	3.402
14.70	1.267	460.75	-----	-----	-----	-----	-----	-----	-----	-----	3.388	3.388
14.73	1.258	460.73	-----	-----	-----	-----	-----	-----	-----	-----	3.374	3.374
14.77	1.250	460.71	-----	-----	-----	-----	-----	-----	-----	-----	3.360	3.360
14.80	1.242	460.70	-----	-----	-----	-----	-----	-----	-----	-----	3.346	3.346
14.83	1.234	460.68	-----	-----	-----	-----	-----	-----	-----	-----	3.332	3.332
14.87	1.226	460.66	-----	-----	-----	-----	-----	-----	-----	-----	3.318	3.318
14.90	1.218	460.65	-----	-----	-----	-----	-----	-----	-----	-----	3.304	3.304
14.93	1.210	460.63	-----	-----	-----	-----	-----	-----	-----	-----	3.290	3.290
14.97	1.203	460.62	-----	-----	-----	-----	-----	-----	-----	-----	3.276	3.276
15.00	1.195	460.60	-----	-----	-----	-----	-----	-----	-----	-----	3.263	3.263
15.03	1.187	460.58	-----	-----	-----	-----	-----	-----	-----	-----	3.249	3.249
15.07	1.179	460.57	-----	-----	-----	-----	-----	-----	-----	-----	3.235	3.235
15.10	1.171	460.55	-----	-----	-----	-----	-----	-----	-----	-----	3.222	3.222
15.13	1.163	460.54	-----	-----	-----	-----	-----	-----	-----	-----	3.208	3.208
15.17	1.156	460.52	-----	-----	-----	-----	-----	-----	-----	-----	3.194	3.194
15.20	1.148	460.50	-----	-----	-----	-----	-----	-----	-----	-----	3.181	3.181
15.23	1.140	460.49	-----	-----	-----	-----	-----	-----	-----	-----	3.168	3.168
15.27	1.132	460.47	-----	-----	-----	-----	-----	-----	-----	-----	3.154	3.154
15.30	1.124	460.46	-----	-----	-----	-----	-----	-----	-----	-----	3.141	3.141
15.33	1.116	460.44	-----	-----	-----	-----	-----	-----	-----	-----	3.127	3.127

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
15.37	1.108	460.42	-----	-----	-----	-----	-----	-----	-----	-----	3.114	3.114
15.40	1.100	460.41	-----	-----	-----	-----	-----	-----	-----	-----	3.101	3.101
15.43	1.092	460.39	-----	-----	-----	-----	-----	-----	-----	-----	3.087	3.087
15.47	1.084	460.38	-----	-----	-----	-----	-----	-----	-----	-----	3.074	3.074
15.50	1.076	460.36	-----	-----	-----	-----	-----	-----	-----	-----	3.061	3.061
15.53	1.068	460.35	-----	-----	-----	-----	-----	-----	-----	-----	3.048	3.048
15.57	1.060	460.33	-----	-----	-----	-----	-----	-----	-----	-----	3.035	3.035
15.60	1.052	460.32	-----	-----	-----	-----	-----	-----	-----	-----	3.022	3.022
15.63	1.044	460.30	-----	-----	-----	-----	-----	-----	-----	-----	3.009	3.009
15.67	1.036	460.28	-----	-----	-----	-----	-----	-----	-----	-----	2.996	2.996
15.70	1.027	460.27	-----	-----	-----	-----	-----	-----	-----	-----	2.983	2.983
15.73	1.019	460.25	-----	-----	-----	-----	-----	-----	-----	-----	2.970	2.970
15.77	1.011	460.24	-----	-----	-----	-----	-----	-----	-----	-----	2.957	2.957
15.80	1.003	460.22	-----	-----	-----	-----	-----	-----	-----	-----	2.944	2.944
15.83	0.995	460.21	-----	-----	-----	-----	-----	-----	-----	-----	2.931	2.931
15.87	0.987	460.19	-----	-----	-----	-----	-----	-----	-----	-----	2.918	2.918
15.90	0.979	460.18	-----	-----	-----	-----	-----	-----	-----	-----	2.905	2.905
15.93	0.970	460.16	-----	-----	-----	-----	-----	-----	-----	-----	2.892	2.892
15.97	0.962	460.15	-----	-----	-----	-----	-----	-----	-----	-----	2.880	2.880
16.00	0.954	460.13	-----	-----	-----	-----	-----	-----	-----	-----	2.867	2.867
16.03	0.946	460.12	-----	-----	-----	-----	-----	-----	-----	-----	2.854	2.854
16.07	0.938	460.10	-----	-----	-----	-----	-----	-----	-----	-----	2.842	2.842
16.10	0.930	460.09	-----	-----	-----	-----	-----	-----	-----	-----	2.829	2.829
16.13	0.922	460.07	-----	-----	-----	-----	-----	-----	-----	-----	2.816	2.816
16.17	0.914	460.06	-----	-----	-----	-----	-----	-----	-----	-----	2.804	2.804
16.20	0.906	460.04	-----	-----	-----	-----	-----	-----	-----	-----	2.791	2.791
16.23	0.899	460.03	-----	-----	-----	-----	-----	-----	-----	-----	2.779	2.779
16.27	0.891	460.01	-----	-----	-----	-----	-----	-----	-----	-----	2.766	2.766

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RETENTION BASIN, A

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
16.30	0.884	460.00	-----	-----	-----	-----	-----	-----	-----	-----	2.751	2.751
16.33	0.878	459.98	-----	-----	-----	-----	-----	-----	-----	-----	2.697	2.697
16.37	0.871	459.96	-----	-----	-----	-----	-----	-----	-----	-----	2.645	2.645
16.40	0.865	459.94	-----	-----	-----	-----	-----	-----	-----	-----	2.593	2.593
16.43	0.860	459.92	-----	-----	-----	-----	-----	-----	-----	-----	2.543	2.543
16.47	0.854	459.91	-----	-----	-----	-----	-----	-----	-----	-----	2.494	2.494
16.50	0.849	459.89	-----	-----	-----	-----	-----	-----	-----	-----	2.447	2.447
16.53	0.845	459.87	-----	-----	-----	-----	-----	-----	-----	-----	2.401	2.401
16.57	0.841	459.86	-----	-----	-----	-----	-----	-----	-----	-----	2.356	2.356
16.60	0.837	459.84	-----	-----	-----	-----	-----	-----	-----	-----	2.312	2.312
16.63	0.833	459.82	-----	-----	-----	-----	-----	-----	-----	-----	2.269	2.269
16.67	0.829	459.81	-----	-----	-----	-----	-----	-----	-----	-----	2.228	2.228
16.70	0.826	459.79	-----	-----	-----	-----	-----	-----	-----	-----	2.187	2.187
16.73	0.823	459.78	-----	-----	-----	-----	-----	-----	-----	-----	2.148	2.148
16.77	0.820	459.77	-----	-----	-----	-----	-----	-----	-----	-----	2.109	2.109
16.80	0.817	459.75	-----	-----	-----	-----	-----	-----	-----	-----	2.072	2.072
16.83	0.814	459.74	-----	-----	-----	-----	-----	-----	-----	-----	2.036	2.036
16.87	0.811	459.73	-----	-----	-----	-----	-----	-----	-----	-----	2.000	2.000
16.90	0.808	459.71	-----	-----	-----	-----	-----	-----	-----	-----	1.966	1.966
16.93	0.805	459.70	-----	-----	-----	-----	-----	-----	-----	-----	1.932	1.932
16.97	0.802	459.69	-----	-----	-----	-----	-----	-----	-----	-----	1.900	1.900
17.00	0.800	459.68	-----	-----	-----	-----	-----	-----	-----	-----	1.868	1.868
17.03	0.797	459.67	-----	-----	-----	-----	-----	-----	-----	-----	1.837	1.837
17.07	0.794	459.66	-----	-----	-----	-----	-----	-----	-----	-----	1.807	1.807
17.10	0.791	459.65	-----	-----	-----	-----	-----	-----	-----	-----	1.778	1.778
17.13	0.788	459.63	-----	-----	-----	-----	-----	-----	-----	-----	1.749	1.749
17.17	0.785	459.62	-----	-----	-----	-----	-----	-----	-----	-----	1.721	1.721
17.20	0.782	459.61	-----	-----	-----	-----	-----	-----	-----	-----	1.694	1.694

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
17.23	0.780	459.61	-----	-----	-----	-----	-----	-----	-----	-----	1.668	1.668
17.27	0.777	459.60	-----	-----	-----	-----	-----	-----	-----	-----	1.642	1.642
17.30	0.774	459.59	-----	-----	-----	-----	-----	-----	-----	-----	1.617	1.617
17.33	0.771	459.58	-----	-----	-----	-----	-----	-----	-----	-----	1.593	1.593
17.37	0.768	459.57	-----	-----	-----	-----	-----	-----	-----	-----	1.569	1.569
17.40	0.765	459.56	-----	-----	-----	-----	-----	-----	-----	-----	1.546	1.546
17.43	0.762	459.55	-----	-----	-----	-----	-----	-----	-----	-----	1.523	1.523
17.47	0.759	459.54	-----	-----	-----	-----	-----	-----	-----	-----	1.501	1.501
17.50	0.756	459.54	-----	-----	-----	-----	-----	-----	-----	-----	1.479	1.479
17.53	0.754	459.53	-----	-----	-----	-----	-----	-----	-----	-----	1.459	1.459
17.57	0.751	459.52	-----	-----	-----	-----	-----	-----	-----	-----	1.438	1.438
17.60	0.748	459.51	-----	-----	-----	-----	-----	-----	-----	-----	1.418	1.418
17.63	0.745	459.51	-----	-----	-----	-----	-----	-----	-----	-----	1.399	1.399
17.67	0.742	459.50	-----	-----	-----	-----	-----	-----	-----	-----	1.380	1.380
17.70	0.739	459.49	-----	-----	-----	-----	-----	-----	-----	-----	1.361	1.361
17.73	0.736	459.49	-----	-----	-----	-----	-----	-----	-----	-----	1.343	1.343
17.77	0.733	459.48	-----	-----	-----	-----	-----	-----	-----	-----	1.326	1.326
17.80	0.730	459.48	-----	-----	-----	-----	-----	-----	-----	-----	1.309	1.309
17.83	0.727	459.47	-----	-----	-----	-----	-----	-----	-----	-----	1.292	1.292
17.87	0.724	459.46	-----	-----	-----	-----	-----	-----	-----	-----	1.275	1.275
17.90	0.722	459.46	-----	-----	-----	-----	-----	-----	-----	-----	1.259	1.259
17.93	0.719	459.45	-----	-----	-----	-----	-----	-----	-----	-----	1.244	1.244
17.97	0.716	459.45	-----	-----	-----	-----	-----	-----	-----	-----	1.229	1.229
18.00	0.713	459.44	-----	-----	-----	-----	-----	-----	-----	-----	1.214	1.214
18.03	0.710	459.44	-----	-----	-----	-----	-----	-----	-----	-----	1.199	1.199
18.07	0.707	459.43	-----	-----	-----	-----	-----	-----	-----	-----	1.185	1.185
18.10	0.704	459.43	-----	-----	-----	-----	-----	-----	-----	-----	1.171	1.171
18.13	0.701	459.42	-----	-----	-----	-----	-----	-----	-----	-----	1.158	1.158

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RETENTION BASIN, A

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
18.17	0.698	459.42	-----	-----	-----	-----	-----	-----	-----	-----	1.144	1.144
18.20	0.695	459.41	-----	-----	-----	-----	-----	-----	-----	-----	1.132	1.131
18.23	0.692	459.41	-----	-----	-----	-----	-----	-----	-----	-----	1.119	1.119
18.27	0.689	459.40	-----	-----	-----	-----	-----	-----	-----	-----	1.106	1.106
18.30	0.686	459.40	-----	-----	-----	-----	-----	-----	-----	-----	1.094	1.094
18.33	0.683	459.39	-----	-----	-----	-----	-----	-----	-----	-----	1.083	1.083
18.37	0.680	459.39	-----	-----	-----	-----	-----	-----	-----	-----	1.071	1.071
18.40	0.677	459.38	-----	-----	-----	-----	-----	-----	-----	-----	1.060	1.060
18.43	0.674	459.38	-----	-----	-----	-----	-----	-----	-----	-----	1.048	1.048
18.47	0.671	459.38	-----	-----	-----	-----	-----	-----	-----	-----	1.038	1.038
18.50	0.668	459.37	-----	-----	-----	-----	-----	-----	-----	-----	1.027	1.027
18.53	0.665	459.37	-----	-----	-----	-----	-----	-----	-----	-----	1.017	1.017
18.57	0.662	459.37	-----	-----	-----	-----	-----	-----	-----	-----	1.006	1.006
18.60	0.659	459.36	-----	-----	-----	-----	-----	-----	-----	-----	0.996	0.996
18.63	0.656	459.36	-----	-----	-----	-----	-----	-----	-----	-----	0.987	0.987
18.67	0.654	459.35	-----	-----	-----	-----	-----	-----	-----	-----	0.977	0.977
18.70	0.651	459.35	-----	-----	-----	-----	-----	-----	-----	-----	0.968	0.968
18.73	0.648	459.35	-----	-----	-----	-----	-----	-----	-----	-----	0.958	0.958
18.77	0.645	459.34	-----	-----	-----	-----	-----	-----	-----	-----	0.949	0.949
18.80	0.642	459.34	-----	-----	-----	-----	-----	-----	-----	-----	0.941	0.941
18.83	0.639	459.34	-----	-----	-----	-----	-----	-----	-----	-----	0.932	0.932
18.87	0.636	459.34	-----	-----	-----	-----	-----	-----	-----	-----	0.923	0.923
18.90	0.633	459.33	-----	-----	-----	-----	-----	-----	-----	-----	0.915	0.915
18.93	0.630	459.33	-----	-----	-----	-----	-----	-----	-----	-----	0.907	0.907
18.97	0.627	459.33	-----	-----	-----	-----	-----	-----	-----	-----	0.899	0.899
19.00	0.624	459.32	-----	-----	-----	-----	-----	-----	-----	-----	0.891	0.891
19.03	0.621	459.32	-----	-----	-----	-----	-----	-----	-----	-----	0.883	0.883
19.07	0.618	459.32	-----	-----	-----	-----	-----	-----	-----	-----	0.875	0.875

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
19.10	0.615	459.32	-----	-----	-----	-----	-----	-----	-----	-----	0.868	0.868
19.13	0.612	459.31	-----	-----	-----	-----	-----	-----	-----	-----	0.861	0.861
19.17	0.608	459.31	-----	-----	-----	-----	-----	-----	-----	-----	0.853	0.853
19.20	0.605	459.31	-----	-----	-----	-----	-----	-----	-----	-----	0.846	0.846
19.23	0.602	459.30	-----	-----	-----	-----	-----	-----	-----	-----	0.839	0.839
19.27	0.599	459.30	-----	-----	-----	-----	-----	-----	-----	-----	0.832	0.832
19.30	0.596	459.30	-----	-----	-----	-----	-----	-----	-----	-----	0.826	0.826
19.33	0.593	459.30	-----	-----	-----	-----	-----	-----	-----	-----	0.819	0.819
19.37	0.590	459.29	-----	-----	-----	-----	-----	-----	-----	-----	0.812	0.812
19.40	0.587	459.29	-----	-----	-----	-----	-----	-----	-----	-----	0.806	0.806
19.43	0.584	459.29	-----	-----	-----	-----	-----	-----	-----	-----	0.799	0.799
19.47	0.581	459.29	-----	-----	-----	-----	-----	-----	-----	-----	0.793	0.793
19.50	0.578	459.29	-----	-----	-----	-----	-----	-----	-----	-----	0.787	0.787
19.53	0.575	459.28	-----	-----	-----	-----	-----	-----	-----	-----	0.781	0.781
19.57	0.572	459.28	-----	-----	-----	-----	-----	-----	-----	-----	0.775	0.775
19.60	0.569	459.28	-----	-----	-----	-----	-----	-----	-----	-----	0.769	0.769
19.63	0.566	459.28	-----	-----	-----	-----	-----	-----	-----	-----	0.763	0.763
19.67	0.563	459.27	-----	-----	-----	-----	-----	-----	-----	-----	0.757	0.757
19.70	0.560	459.27	-----	-----	-----	-----	-----	-----	-----	-----	0.752	0.752
19.73	0.557	459.27	-----	-----	-----	-----	-----	-----	-----	-----	0.746	0.746
19.77	0.554	459.27	-----	-----	-----	-----	-----	-----	-----	-----	0.741	0.741
19.80	0.551	459.27	-----	-----	-----	-----	-----	-----	-----	-----	0.735	0.735
19.83	0.548	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.730	0.730
19.87	0.545	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.725	0.725
19.90	0.542	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.719	0.719
19.93	0.539	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.714	0.714
19.97	0.536	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.709	0.709
20.00	0.532	459.26	-----	-----	-----	-----	-----	-----	-----	-----	0.704	0.704

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.03	0.529	459.25	-----	-----	-----	-----	-----	-----	-----	-----	0.699	0.699
20.07	0.526	459.25	-----	-----	-----	-----	-----	-----	-----	-----	0.694	0.694
20.10	0.523	459.25	-----	-----	-----	-----	-----	-----	-----	-----	0.689	0.689
20.13	0.520	459.25	-----	-----	-----	-----	-----	-----	-----	-----	0.684	0.684
20.17	0.518	459.25	-----	-----	-----	-----	-----	-----	-----	-----	0.680	0.680
20.20	0.515	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.675	0.675
20.23	0.512	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.670	0.670
20.27	0.509	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.665	0.666
20.30	0.507	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.661	0.661
20.33	0.505	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.656	0.656
20.37	0.502	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.652	0.652
20.40	0.500	459.24	-----	-----	-----	-----	-----	-----	-----	-----	0.648	0.648
20.43	0.498	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.643	0.643
20.47	0.497	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.639	0.639
20.50	0.495	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.635	0.635
20.53	0.494	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.631	0.631
20.57	0.493	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.627	0.627
20.60	0.492	459.23	-----	-----	-----	-----	-----	-----	-----	-----	0.623	0.623
20.63	0.491	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.619	0.619
20.67	0.490	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.616	0.616
20.70	0.489	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.612	0.612
20.73	0.488	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.608	0.608
20.77	0.487	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.605	0.605
20.80	0.487	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.601	0.601
20.83	0.486	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.598	0.598
20.87	0.486	459.22	-----	-----	-----	-----	-----	-----	-----	-----	0.595	0.595
20.90	0.485	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.592	0.592
20.93	0.485	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.589	0.589

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.97	0.484	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.586	0.586
21.00	0.483	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.583	0.583
21.03	0.483	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.580	0.580
21.07	0.482	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.577	0.577
21.10	0.482	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.574	0.574
21.13	0.481	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.572	0.572
21.17	0.481	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.569	0.569
21.20	0.480	459.21	-----	-----	-----	-----	-----	-----	-----	-----	0.566	0.566
21.23	0.480	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.564	0.564
21.27	0.479	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.561	0.561
21.30	0.478	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.559	0.559
21.33	0.478	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.557	0.557
21.37	0.477	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.554	0.554
21.40	0.477	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.552	0.552
21.43	0.476	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.550	0.550
21.47	0.476	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.548	0.548
21.50	0.475	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.546	0.546
21.53	0.474	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.544	0.544
21.57	0.474	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.542	0.542
21.60	0.473	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.540	0.540
21.63	0.473	459.20	-----	-----	-----	-----	-----	-----	-----	-----	0.538	0.538
21.67	0.472	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.536	0.536
21.70	0.472	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.534	0.534
21.73	0.471	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.532	0.532
21.77	0.470	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.530	0.530
21.80	0.470	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.529	0.529
21.83	0.469	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.527	0.527
21.87	0.469	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.525	0.525

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RETENTION BASIN, A

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
21.90	0.468	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.524	0.524
21.93	0.468	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.522	0.522
21.97	0.467	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.520	0.520
22.00	0.466	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.519	0.519
22.03	0.466	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.517	0.517
22.07	0.465	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.516	0.516
22.10	0.465	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.514	0.514
22.13	0.464	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.513	0.513
22.17	0.464	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.512	0.512
22.20	0.463	459.19	-----	-----	-----	-----	-----	-----	-----	-----	0.510	0.510
22.23	0.462	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.509	0.509
22.27	0.462	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.507	0.507
22.30	0.461	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.506	0.506
22.33	0.461	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.505	0.505
22.37	0.460	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.504	0.504
22.40	0.460	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.502	0.502
22.43	0.459	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.501	0.501
22.47	0.458	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.500	0.500
22.50	0.458	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.499	0.499
22.53	0.457	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.497	0.497
22.57	0.457	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.496	0.496
22.60	0.456	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.495	0.495
22.63	0.456	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.494	0.494
22.67	0.455	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.493	0.493
22.70	0.454	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.492	0.492
22.73	0.454	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.491	0.491
22.77	0.453	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.490	0.490
22.80	0.453	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.489	0.489

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.83	0.452	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.487	0.487
22.87	0.451	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.486	0.486
22.90	0.451	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.485	0.485
22.93	0.450	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.484	0.484
22.97	0.450	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.483	0.483
23.00	0.449	459.18	-----	-----	-----	-----	-----	-----	-----	-----	0.482	0.482
23.03	0.449	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.481	0.481
23.07	0.448	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.481	0.481
23.10	0.447	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.480	0.480
23.13	0.447	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.479	0.479
23.17	0.446	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.478	0.478
23.20	0.446	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.477	0.477
23.23	0.445	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.476	0.476
23.27	0.445	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.475	0.475
23.30	0.444	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.474	0.474
23.33	0.443	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.473	0.473
23.37	0.443	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.472	0.472
23.40	0.442	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.471	0.471
23.43	0.442	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.471	0.471
23.47	0.441	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.470	0.470
23.50	0.440	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.469	0.469
23.53	0.440	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.468	0.468
23.57	0.439	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.467	0.467
23.60	0.439	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.466	0.466
23.63	0.438	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.466	0.466
23.67	0.437	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.465	0.465
23.70	0.437	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.464	0.464
23.73	0.436	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.463	0.463

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
23.77	0.436	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.462	0.462
23.80	0.435	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.462	0.462
23.83	0.435	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.461	0.461
23.87	0.434	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.460	0.460
23.90	0.433	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.459	0.459
23.93	0.433	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.459	0.459
23.97	0.432	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.458	0.458
24.00	0.432	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.457	0.457
24.03	0.429	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.456	0.456
24.07	0.423	459.17	-----	-----	-----	-----	-----	-----	-----	-----	0.455	0.455
24.10	0.415	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.454	0.454
24.13	0.405	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.453	0.453
24.17	0.393	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.452	0.452
24.20	0.377	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.450	0.450
24.23	0.360	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.447	0.447
24.27	0.340	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.444	0.444
24.30	0.318	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.441	0.441
24.33	0.293	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.437	0.437
24.37	0.266	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.433	0.433
24.40	0.237	459.16	-----	-----	-----	-----	-----	-----	-----	-----	0.427	0.427
24.43	0.205	459.15	-----	-----	-----	-----	-----	-----	-----	-----	0.422	0.421
24.47	0.176	459.15	-----	-----	-----	-----	-----	-----	-----	-----	0.415	0.415
24.50	0.149	459.15	-----	-----	-----	-----	-----	-----	-----	-----	0.408	0.408
24.53	0.124	459.15	-----	-----	-----	-----	-----	-----	-----	-----	0.400	0.400
24.57	0.101	459.14	-----	-----	-----	-----	-----	-----	-----	-----	0.391	0.391
24.60	0.081	459.14	-----	-----	-----	-----	-----	-----	-----	-----	0.383	0.383
24.63	0.063	459.14	-----	-----	-----	-----	-----	-----	-----	-----	0.374	0.374
24.67	0.047	459.13	-----	-----	-----	-----	-----	-----	-----	-----	0.365	0.365

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
24.70	0.034	459.13	-----	-----	-----	-----	-----	-----	-----	-----	0.355	0.355
24.73	0.022	459.13	-----	-----	-----	-----	-----	-----	-----	-----	0.346	0.346
24.77	0.013	459.12	-----	-----	-----	-----	-----	-----	-----	-----	0.336	0.336
24.80	0.007	459.12	-----	-----	-----	-----	-----	-----	-----	-----	0.327	0.327
24.83	0.002	459.12	-----	-----	-----	-----	-----	-----	-----	-----	0.318	0.317
24.87	0.000	459.11	-----	-----	-----	-----	-----	-----	-----	-----	0.308	0.308
24.90	0.000	459.11	-----	-----	-----	-----	-----	-----	-----	-----	0.299	0.299
24.93	0.000	459.11	-----	-----	-----	-----	-----	-----	-----	-----	0.291	0.291
24.97	0.000	459.10	-----	-----	-----	-----	-----	-----	-----	-----	0.282	0.282
25.00	0.000	459.10	-----	-----	-----	-----	-----	-----	-----	-----	0.274	0.274
25.03	0.000	459.10	-----	-----	-----	-----	-----	-----	-----	-----	0.266	0.266
25.07	0.000	459.09	-----	-----	-----	-----	-----	-----	-----	-----	0.259	0.259
25.10	0.000	459.09	-----	-----	-----	-----	-----	-----	-----	-----	0.251	0.251
25.13	0.000	459.09	-----	-----	-----	-----	-----	-----	-----	-----	0.244	0.244
25.17	0.000	459.09	-----	-----	-----	-----	-----	-----	-----	-----	0.237	0.237
25.20	0.000	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.230	0.230
25.23	0.000	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.223	0.223
25.27	0.000	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.217	0.217
25.30	0.000	459.08	-----	-----	-----	-----	-----	-----	-----	-----	0.211	0.211
25.33	0.000	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.205	0.205
25.37	0.000	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.199	0.199
25.40	0.000	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.193	0.193
25.43	0.000	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.187	0.187
25.47	0.000	459.07	-----	-----	-----	-----	-----	-----	-----	-----	0.182	0.182
25.50	0.000	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.177	0.177
25.53	0.000	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.171	0.172
25.57	0.000	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.167	0.167
25.60	0.000	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.162	0.162

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
25.63	0.000	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.157	0.157
25.67	0.000	459.06	-----	-----	-----	-----	-----	-----	-----	-----	0.152	0.153
25.70	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.148	0.148
25.73	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.144	0.144
25.77	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.140	0.140
25.80	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.136	0.136
25.83	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.132	0.132
25.87	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.128	0.128
25.90	0.000	459.05	-----	-----	-----	-----	-----	-----	-----	-----	0.124	0.124
25.93	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.121	0.121
25.97	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.117	0.117
26.00	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.114	0.114
26.03	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.110	0.110
26.07	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.107	0.107
26.10	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.104	0.104
26.13	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.101	0.101
26.17	0.000	459.04	-----	-----	-----	-----	-----	-----	-----	-----	0.098	0.098
26.20	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.095	0.095
26.23	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.093	0.093
26.27	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.090	0.090
26.30	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.087	0.087
26.33	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.085	0.085
26.37	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.082	0.082
26.40	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.080	0.080
26.43	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.078	0.078
26.47	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.075	0.075
26.50	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.073	0.073
26.53	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.071	0.071

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
26.57	0.000	459.03	-----	-----	-----	-----	-----	-----	-----	-----	0.069	0.069
26.60	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.067	0.067
26.63	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.065	0.065
26.67	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.063	0.063
26.70	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.061	0.061
26.73	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.060	0.060
26.77	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.058	0.058
26.80	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.056	0.056
26.83	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.055	0.055
26.87	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.053	0.053
26.90	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.052	0.052
26.93	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.050	0.050
26.97	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.049	0.049
27.00	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.047	0.047
27.03	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.046	0.046
27.07	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.044	0.044
27.10	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.043	0.043
27.13	0.000	459.02	-----	-----	-----	-----	-----	-----	-----	-----	0.042	0.042
27.17	0.000	459.01	-----	-----	-----	-----	-----	-----	-----	-----	0.041	0.041
27.20	0.000	459.01	-----	-----	-----	-----	-----	-----	-----	-----	0.040	0.040

...End

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 06 / 7 / 2023

Pond No. 2 - RETENTION BASIN, A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 459.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	459.00	9,349	0	0
1.00	460.00	13,312	11,271	11,271
2.00	461.00	17,404	15,311	26,582
3.00	462.00	21,623	19,473	46,055
4.00	463.00	25,971	23,761	69,817
5.00	464.00	30,446	28,176	97,993
6.00	465.00	35,050	32,718	130,711
7.00	466.00	39,781	37,387	168,098

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 459.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 8.940 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	459.00	---	---	---	---	---	---	---	---	0.000	---	0.000
0.10	1,127	459.10	---	---	---	---	---	---	---	---	0.275	---	0.275
0.20	2,254	459.20	---	---	---	---	---	---	---	---	0.551	---	0.551
0.30	3,381	459.30	---	---	---	---	---	---	---	---	0.826	---	0.826
0.40	4,508	459.40	---	---	---	---	---	---	---	---	1.102	---	1.102
0.50	5,636	459.50	---	---	---	---	---	---	---	---	1.377	---	1.377
0.60	6,763	459.60	---	---	---	---	---	---	---	---	1.653	---	1.653
0.70	7,890	459.70	---	---	---	---	---	---	---	---	1.928	---	1.928
0.80	9,017	459.80	---	---	---	---	---	---	---	---	2.204	---	2.204
0.90	10,144	459.90	---	---	---	---	---	---	---	---	2.479	---	2.479
1.00	11,271	460.00	---	---	---	---	---	---	---	---	2.755	---	2.755
1.10	12,802	460.10	---	---	---	---	---	---	---	---	2.840	---	2.840
1.20	14,333	460.20	---	---	---	---	---	---	---	---	2.924	---	2.924
1.30	15,864	460.30	---	---	---	---	---	---	---	---	3.009	---	3.009
1.40	17,396	460.40	---	---	---	---	---	---	---	---	3.094	---	3.094
1.50	18,927	460.50	---	---	---	---	---	---	---	---	3.178	---	3.178
1.60	20,458	460.60	---	---	---	---	---	---	---	---	3.263	---	3.263
1.70	21,989	460.70	---	---	---	---	---	---	---	---	3.348	---	3.348
1.80	23,520	460.80	---	---	---	---	---	---	---	---	3.432	---	3.432
1.90	25,051	460.90	---	---	---	---	---	---	---	---	3.517	---	3.517
2.00	26,582	461.00	---	---	---	---	---	---	---	---	3.602	---	3.602
2.10	28,529	461.10	---	---	---	---	---	---	---	---	3.689	---	3.689
2.20	30,477	461.20	---	---	---	---	---	---	---	---	3.776	---	3.776
2.30	32,424	461.30	---	---	---	---	---	---	---	---	3.864	---	3.864
2.40	34,371	461.40	---	---	---	---	---	---	---	---	3.951	---	3.951
2.50	36,319	461.50	---	---	---	---	---	---	---	---	4.038	---	4.038
2.60	38,266	461.60	---	---	---	---	---	---	---	---	4.125	---	4.125
2.70	40,213	461.70	---	---	---	---	---	---	---	---	4.213	---	4.213
2.80	42,161	461.80	---	---	---	---	---	---	---	---	4.300	---	4.300
2.90	44,108	461.90	---	---	---	---	---	---	---	---	4.387	---	4.387
3.00	46,055	462.00	---	---	---	---	---	---	---	---	4.475	---	4.475
3.10	48,432	462.10	---	---	---	---	---	---	---	---	4.565	---	4.565
3.20	50,808	462.20	---	---	---	---	---	---	---	---	4.655	---	4.655
3.30	53,184	462.30	---	---	---	---	---	---	---	---	4.745	---	4.745
3.40	55,560	462.40	---	---	---	---	---	---	---	---	4.835	---	4.835

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RETENTION BASIN, A

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.50	57,936	462.50	---	---	---	---	---	---	---	---	4.925	---	4.925
3.60	60,312	462.60	---	---	---	---	---	---	---	---	5.015	---	5.015
3.70	62,688	462.70	---	---	---	---	---	---	---	---	5.105	---	5.105
3.80	65,065	462.80	---	---	---	---	---	---	---	---	5.195	---	5.195
3.90	67,441	462.90	---	---	---	---	---	---	---	---	5.285	---	5.285
4.00	69,817	463.00	---	---	---	---	---	---	---	---	5.375	---	5.375
4.10	72,635	463.10	---	---	---	---	---	---	---	---	5.467	---	5.467
4.20	75,452	463.20	---	---	---	---	---	---	---	---	5.560	---	5.560
4.30	78,270	463.30	---	---	---	---	---	---	---	---	5.652	---	5.652
4.40	81,087	463.40	---	---	---	---	---	---	---	---	5.745	---	5.745
4.50	83,905	463.50	---	---	---	---	---	---	---	---	5.838	---	5.838
4.60	86,723	463.60	---	---	---	---	---	---	---	---	5.930	---	5.930
4.70	89,540	463.70	---	---	---	---	---	---	---	---	6.023	---	6.023
4.80	92,358	463.80	---	---	---	---	---	---	---	---	6.115	---	6.115
4.90	95,175	463.90	---	---	---	---	---	---	---	---	6.208	---	6.208
5.00	97,993	464.00	---	---	---	---	---	---	---	---	6.301	---	6.301
5.10	101,265	464.10	---	---	---	---	---	---	---	---	6.396	---	6.396
5.20	104,537	464.20	---	---	---	---	---	---	---	---	6.491	---	6.491
5.30	107,808	464.30	---	---	---	---	---	---	---	---	6.586	---	6.586
5.40	111,080	464.40	---	---	---	---	---	---	---	---	6.682	---	6.682
5.50	114,352	464.50	---	---	---	---	---	---	---	---	6.777	---	6.777
5.60	117,624	464.60	---	---	---	---	---	---	---	---	6.872	---	6.872
5.70	120,895	464.70	---	---	---	---	---	---	---	---	6.968	---	6.968
5.80	124,167	464.80	---	---	---	---	---	---	---	---	7.063	---	7.063
5.90	127,439	464.90	---	---	---	---	---	---	---	---	7.158	---	7.158
6.00	130,711	465.00	---	---	---	---	---	---	---	---	7.253	---	7.253
6.10	134,449	465.10	---	---	---	---	---	---	---	---	7.351	---	7.351
6.20	138,188	465.20	---	---	---	---	---	---	---	---	7.449	---	7.449
6.30	141,927	465.30	---	---	---	---	---	---	---	---	7.547	---	7.547
6.40	145,665	465.40	---	---	---	---	---	---	---	---	7.645	---	7.645
6.50	149,404	465.50	---	---	---	---	---	---	---	---	7.743	---	7.743
6.60	153,143	465.60	---	---	---	---	---	---	---	---	7.841	---	7.841
6.70	156,882	465.70	---	---	---	---	---	---	---	---	7.939	---	7.939
6.80	160,620	465.80	---	---	---	---	---	---	---	---	8.037	---	8.037
6.90	164,359	465.90	---	---	---	---	---	---	---	---	8.134	---	8.134
7.00	168,098	466.00	---	---	---	---	---	---	---	---	8.232	---	8.232

...End

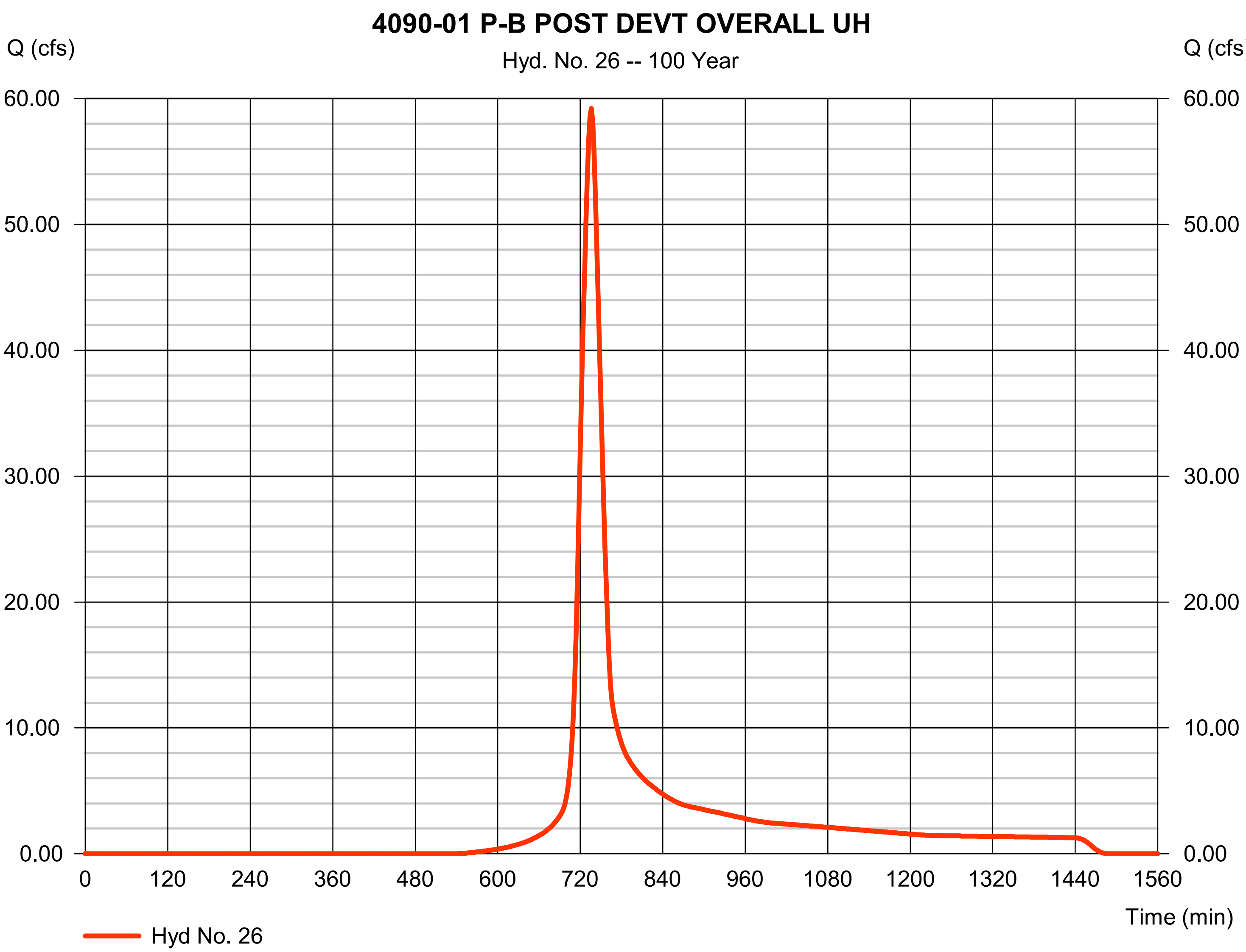
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 26

4090-01 P-B POST DEVT OVERALL UH

Hydrograph type	= SCS Runoff	Peak discharge	= 59.21 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 244,175 cuft
Drainage area	= 32.640 ac	Curve number	= 77
Basin Slope	= 2.8 %	Hydraulic length	= 2264 ft
Tc method	= LAG	Time of conc. (Tc)	= 40.44 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 623



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hydrograph Report

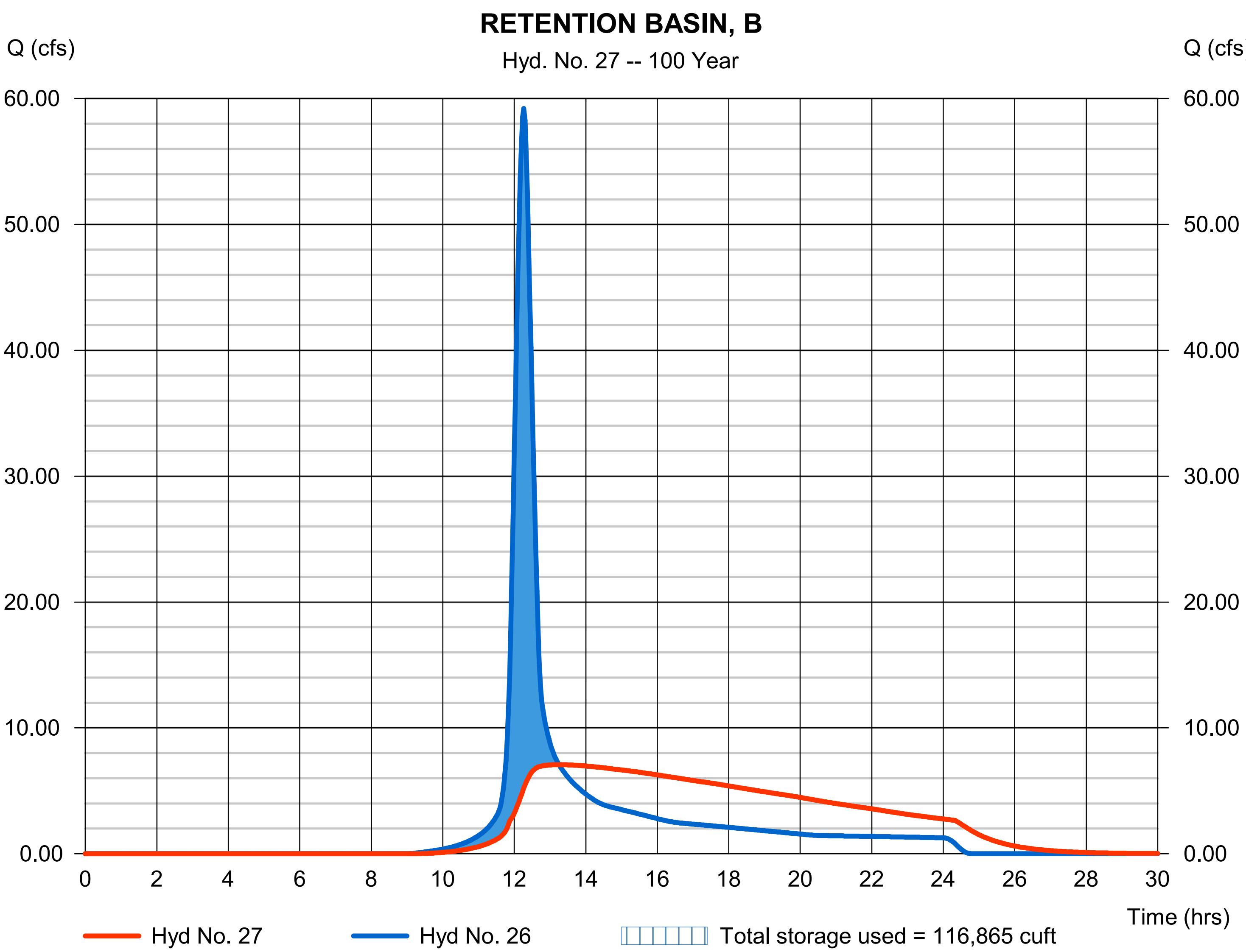
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 06 / 5 / 2023

Hyd. No. 27

RETENTION BASIN, B

Hydrograph type	= Reservoir	Peak discharge	= 7.079 cfs
Storm frequency	= 100 yrs	Time to peak	= 13.27 hrs
Time interval	= 2 min	Hyd. volume	= 244,171 cuft
Inflow hyd. No.	= 26 - 4090-01 P-B POST DEVT OVERALL UH	Max. Elevation	= 459.55 ft
Reservoir name	= RETENTION BASIN,B	Max. Storage	= 116,865 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Pond No. 1 - RETENTION BASIN,B

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 454.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	454.00	8,450	0	0
1.00	455.00	12,799	10,548	10,548
2.00	456.00	17,275	14,980	25,528
3.00	457.00	21,879	19,530	45,058
4.00	458.00	26,612	24,204	69,262
5.00	459.00	31,472	29,005	98,268
6.00	460.00	36,460	33,932	132,200
7.00	461.00	41,577	38,987	171,186
8.00	462.00	46,821	44,169	215,355
9.00	463.00	52,193	49,478	264,833
10.00	464.00	57,694	54,915	319,748

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 454.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 8.940 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	454.00	---	---	---	---	---	---	---	---	0.000	---	0.000
0.10	1,055	454.10	---	---	---	---	---	---	---	---	0.265	---	0.265
0.20	2,110	454.20	---	---	---	---	---	---	---	---	0.530	---	0.530
0.30	3,165	454.30	---	---	---	---	---	---	---	---	0.795	---	0.795
0.40	4,219	454.40	---	---	---	---	---	---	---	---	1.059	---	1.059
0.50	5,274	454.50	---	---	---	---	---	---	---	---	1.324	---	1.324
0.60	6,329	454.60	---	---	---	---	---	---	---	---	1.589	---	1.589
0.70	7,384	454.70	---	---	---	---	---	---	---	---	1.854	---	1.854
0.80	8,439	454.80	---	---	---	---	---	---	---	---	2.119	---	2.119
0.90	9,494	454.90	---	---	---	---	---	---	---	---	2.384	---	2.384
1.00	10,548	455.00	---	---	---	---	---	---	---	---	2.649	---	2.649
1.10	12,046	455.10	---	---	---	---	---	---	---	---	2.741	---	2.741
1.20	13,544	455.20	---	---	---	---	---	---	---	---	2.834	---	2.834
1.30	15,042	455.30	---	---	---	---	---	---	---	---	2.927	---	2.927
1.40	16,540	455.40	---	---	---	---	---	---	---	---	3.019	---	3.019
1.50	18,038	455.50	---	---	---	---	---	---	---	---	3.112	---	3.112
1.60	19,536	455.60	---	---	---	---	---	---	---	---	3.204	---	3.204
1.70	21,034	455.70	---	---	---	---	---	---	---	---	3.297	---	3.297
1.80	22,532	455.80	---	---	---	---	---	---	---	---	3.390	---	3.390
1.90	24,030	455.90	---	---	---	---	---	---	---	---	3.482	---	3.482
2.00	25,528	456.00	---	---	---	---	---	---	---	---	3.575	---	3.575
2.10	27,481	456.10	---	---	---	---	---	---	---	---	3.670	---	3.670
2.20	29,434	456.20	---	---	---	---	---	---	---	---	3.765	---	3.765
2.30	31,387	456.30	---	---	---	---	---	---	---	---	3.861	---	3.861
2.40	33,340	456.40	---	---	---	---	---	---	---	---	3.956	---	3.956
2.50	35,293	456.50	---	---	---	---	---	---	---	---	4.051	---	4.051
2.60	37,246	456.60	---	---	---	---	---	---	---	---	4.147	---	4.147
2.70	39,199	456.70	---	---	---	---	---	---	---	---	4.242	---	4.242
2.80	41,152	456.80	---	---	---	---	---	---	---	---	4.337	---	4.337
2.90	43,105	456.90	---	---	---	---	---	---	---	---	4.432	---	4.432
3.00	45,058	457.00	---	---	---	---	---	---	---	---	4.528	---	4.528
3.10	47,478	457.10	---	---	---	---	---	---	---	---	4.626	---	4.626

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RETENTION BASIN,B

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.20	49,899	457.20	---	---	---	---	---	---	---	---	4.724	---	4.724
3.30	52,319	457.30	---	---	---	---	---	---	---	---	4.822	---	4.822
3.40	54,740	457.40	---	---	---	---	---	---	---	---	4.919	---	4.919
3.50	57,160	457.50	---	---	---	---	---	---	---	---	5.017	---	5.017
3.60	59,581	457.60	---	---	---	---	---	---	---	---	5.115	---	5.115
3.70	62,001	457.70	---	---	---	---	---	---	---	---	5.213	---	5.213
3.80	64,422	457.80	---	---	---	---	---	---	---	---	5.311	---	5.311
3.90	66,842	457.90	---	---	---	---	---	---	---	---	5.409	---	5.409
4.00	69,262	458.00	---	---	---	---	---	---	---	---	5.507	---	5.507
4.10	72,163	458.10	---	---	---	---	---	---	---	---	5.608	---	5.608
4.20	75,063	458.20	---	---	---	---	---	---	---	---	5.708	---	5.708
4.30	77,964	458.30	---	---	---	---	---	---	---	---	5.809	---	5.809
4.40	80,864	458.40	---	---	---	---	---	---	---	---	5.909	---	5.909
4.50	83,765	458.50	---	---	---	---	---	---	---	---	6.010	---	6.010
4.60	86,666	458.60	---	---	---	---	---	---	---	---	6.111	---	6.111
4.70	89,566	458.70	---	---	---	---	---	---	---	---	6.211	---	6.211
4.80	92,467	458.80	---	---	---	---	---	---	---	---	6.312	---	6.312
4.90	95,367	458.90	---	---	---	---	---	---	---	---	6.412	---	6.412
5.00	98,268	459.00	---	---	---	---	---	---	---	---	6.513	---	6.513
5.10	101,661	459.10	---	---	---	---	---	---	---	---	6.616	---	6.616
5.20	105,054	459.20	---	---	---	---	---	---	---	---	6.719	---	6.719
5.30	108,447	459.30	---	---	---	---	---	---	---	---	6.823	---	6.823
5.40	111,840	459.40	---	---	---	---	---	---	---	---	6.926	---	6.926
5.50	115,234	459.50	---	---	---	---	---	---	---	---	7.029	---	7.029
5.60	118,627	459.60	---	---	---	---	---	---	---	---	7.132	---	7.132
5.70	122,020	459.70	---	---	---	---	---	---	---	---	7.235	---	7.235
5.80	125,413	459.80	---	---	---	---	---	---	---	---	7.339	---	7.339
5.90	128,806	459.90	---	---	---	---	---	---	---	---	7.442	---	7.442
6.00	132,200	460.00	---	---	---	---	---	---	---	---	7.545	---	7.545
6.10	136,098	460.10	---	---	---	---	---	---	---	---	7.651	---	7.651
6.20	139,997	460.20	---	---	---	---	---	---	---	---	7.757	---	7.757
6.30	143,896	460.30	---	---	---	---	---	---	---	---	7.863	---	7.863
6.40	147,794	460.40	---	---	---	---	---	---	---	---	7.969	---	7.969
6.50	151,693	460.50	---	---	---	---	---	---	---	---	8.075	---	8.075
6.60	155,592	460.60	---	---	---	---	---	---	---	---	8.181	---	8.181
6.70	159,490	460.70	---	---	---	---	---	---	---	---	8.286	---	8.286
6.80	163,389	460.80	---	---	---	---	---	---	---	---	8.392	---	8.392
6.90	167,288	460.90	---	---	---	---	---	---	---	---	8.498	---	8.498
7.00	171,186	461.00	---	---	---	---	---	---	---	---	8.604	---	8.604
7.10	175,603	461.10	---	---	---	---	---	---	---	---	8.713	---	8.713
7.20	180,020	461.20	---	---	---	---	---	---	---	---	8.821	---	8.821
7.30	184,437	461.30	---	---	---	---	---	---	---	---	8.930	---	8.930
7.40	188,854	461.40	---	---	---	---	---	---	---	---	9.038	---	9.038
7.50	193,271	461.50	---	---	---	---	---	---	---	---	9.147	---	9.147
7.60	197,687	461.60	---	---	---	---	---	---	---	---	9.255	---	9.255
7.70	202,104	461.70	---	---	---	---	---	---	---	---	9.364	---	9.364
7.80	206,521	461.80	---	---	---	---	---	---	---	---	9.472	---	9.472
7.90	210,938	461.90	---	---	---	---	---	---	---	---	9.581	---	9.581
8.00	215,355	462.00	---	---	---	---	---	---	---	---	9.689	---	9.689
8.10	220,303	462.10	---	---	---	---	---	---	---	---	9.800	---	9.800
8.20	225,250	462.20	---	---	---	---	---	---	---	---	9.912	---	9.912
8.30	230,198	462.30	---	---	---	---	---	---	---	---	10.023	---	10.02
8.40	235,146	462.40	---	---	---	---	---	---	---	---	10.134	---	10.13
8.50	240,094	462.50	---	---	---	---	---	---	---	---	10.245	---	10.25
8.60	245,042	462.60	---	---	---	---	---	---	---	---	10.356	---	10.36
8.70	249,989	462.70	---	---	---	---	---	---	---	---	10.467	---	10.47
8.80	254,937	462.80	---	---	---	---	---	---	---	---	10.579	---	10.58
8.90	259,885	462.90	---	---	---	---	---	---	---	---	10.690	---	10.69
9.00	264,833	463.00	---	---	---	---	---	---	---	---	10.801	---	10.80
9.10	270,324	463.10	---	---	---	---	---	---	---	---	10.915	---	10.91
9.20	275,816	463.20	---	---	---	---	---	---	---	---	11.029	---	11.03
9.30	281,307	463.30	---	---	---	---	---	---	---	---	11.142	---	11.14
9.40	286,799	463.40	---	---	---	---	---	---	---	---	11.256	---	11.26
9.50	292,290	463.50	---	---	---	---	---	---	---	---	11.370	---	11.37
9.60	297,782	463.60	---	---	---	---	---	---	---	---	11.484	---	11.48
9.70	303,273	463.70	---	---	---	---	---	---	---	---	11.598	---	11.60
9.80	308,765	463.80	---	---	---	---	---	---	---	---	11.712	---	11.71
9.90	314,256	463.90	---	---	---	---	---	---	---	---	11.826	---	11.83
10.00	319,748	464.00	---	---	---	---	---	---	---	---	11.939	---	11.94

...End

Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	5.0994	0.1000	0.5670	--------
3	0.0000	0.0000	0.0000	--------
5	5.5223	0.1000	0.4686	--------
10	9.9784	0.1000	0.5666	--------
25	10.1229	0.1000	0.5206	--------
50	14.1968	0.1000	0.5656	--------
100	15.9941	0.1000	0.5621	--------

File name: 4090-01 Intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.02	1.37	1.09	0.93	0.82	0.74	0.68	0.63	0.59	0.55	0.53	0.50
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.57	1.87	1.55	1.35	1.22	1.12	1.04	0.98	0.93	0.88	0.84	0.81
10	3.96	2.69	2.14	1.82	1.61	1.45	1.33	1.23	1.15	1.09	1.03	0.98
25	4.33	3.04	2.46	2.12	1.89	1.72	1.59	1.48	1.39	1.32	1.26	1.20
50	5.65	3.84	3.06	2.60	2.29	2.07	1.90	1.76	1.65	1.55	1.47	1.40
100	6.40	4.36	3.48	2.96	2.61	2.36	2.16	2.01	1.88	1.77	1.68	1.60

Tc = time in minutes. Values may exceed 60.

e: F:\Projects\4090\001_Support Files\Reports\Hydrology\TTM - 38710 & 38711\Calculation\4090-01 Precipitation.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	1.28	0.00	2.04	2.33	3.18	4.00	4.30
SCS 6-Hr	0.00	0.82	0.00	1.13	1.28	1.83	2.11	2.50
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 — Monday, 06 / 5 / 2023

Hyd. No. 1

4090-01 PRE-DEVT-EX-A UNIT HYDRO-TTM38710&11

Hydrograph type	= SCS Runoff	Peak discharge	= 13.31 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 85,427 cuft
Drainage area	= 19.500 ac	Curve number	= 65.000
Basin Slope	= 1.8 %	Hydraulic length	= 1440 ft
Tc method	= LAG	Time of conc. (Tc)	= 48.8 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 1.00% of Qp.)

Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)
11.67	0.145	12.27	11.23	12.87	8.721	13.47	2.969
11.70	0.212	12.30	11.98	12.90	8.234	13.50	2.894
11.73	0.308	12.33	12.61	12.93	7.737	13.53	2.824
11.77	0.441	12.37	13.08	12.97	7.234	13.57	2.760
11.80	0.632	12.40	13.31 <<	13.00	6.730	13.60	2.700
11.83	0.905	12.43	13.31	13.03	6.228	13.63	2.644
11.87	1.291	12.47	13.15	13.07	5.733	13.67	2.592
11.90	1.829	12.50	12.91	13.10	5.252	13.70	2.543
11.93	2.522	12.53	12.64	13.13	4.795	13.73	2.497
11.97	3.323	12.57	12.35	13.17	4.380	13.77	2.454
12.00	4.176	12.60	12.03	13.20	4.023	13.80	2.412
12.03	5.049	12.63	11.69	13.23	3.750	13.83	2.371
12.07	5.940	12.67	11.32	13.27	3.562	13.87	2.331
12.10	6.842	12.70	10.93	13.30	3.432	13.90	2.293
12.13	7.749	12.73	10.53	13.33	3.327	13.93	2.255
12.17	8.654	12.77	10.10	13.37	3.228	13.97	2.219
12.20	9.545	12.80	9.656	13.40	3.135	14.00	2.184
12.23	10.41	12.83	9.196	13.43	3.049	14.03	2.149

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4090-01 PRE-DEVT-EX-A UNIT HYDRO-TTM38710&11

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)
14.07	2.116	14.97	1.560	15.87	1.301	16.77	1.077
14.10	2.084	15.00	1.549	15.90	1.292	16.80	1.072
14.13	2.052	15.03	1.539	15.93	1.282	16.83	1.067
14.17	2.022	15.07	1.529	15.97	1.272	16.87	1.062
14.20	1.992	15.10	1.519	16.00	1.262	16.90	1.058
14.23	1.964	15.13	1.509	16.03	1.252	16.93	1.054
14.27	1.936	15.17	1.499	16.07	1.243	16.97	1.049
14.30	1.909	15.20	1.490	16.10	1.233	17.00	1.045
14.33	1.883	15.23	1.481	16.13	1.223	17.03	1.041
14.37	1.858	15.27	1.472	16.17	1.213	17.07	1.038
14.40	1.834	15.30	1.462	16.20	1.204	17.10	1.034
14.43	1.811	15.33	1.453	16.23	1.194	17.13	1.030
14.47	1.789	15.37	1.444	16.27	1.185	17.17	1.027
14.50	1.768	15.40	1.435	16.30	1.176	17.20	1.023
14.53	1.748	15.43	1.425	16.33	1.167	17.23	1.020
14.57	1.729	15.47	1.416	16.37	1.158	17.27	1.017
14.60	1.711	15.50	1.407	16.40	1.150	17.30	1.013
14.63	1.694	15.53	1.397	16.43	1.142	17.33	1.010
14.67	1.678	15.57	1.388	16.47	1.134	17.37	1.006
14.70	1.662	15.60	1.378	16.50	1.126	17.40	1.003
14.73	1.647	15.63	1.369	16.53	1.119	17.43	1.000
14.77	1.633	15.67	1.359	16.57	1.112	17.47	0.996
14.80	1.620	15.70	1.350	16.60	1.106	17.50	0.993
14.83	1.607	15.73	1.340	16.63	1.100	17.53	0.989
14.87	1.595	15.77	1.330	16.67	1.093	17.57	0.986
14.90	1.583	15.80	1.321	16.70	1.088	17.60	0.982
14.93	1.571	15.83	1.311	16.73	1.082	17.63	0.979

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Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)
17.67	0.975	18.57	0.879	19.47	0.779	20.37	0.677
17.70	0.972	18.60	0.876	19.50	0.775	20.40	0.674
17.73	0.968	18.63	0.872	19.53	0.771	20.43	0.671
17.77	0.965	18.67	0.868	19.57	0.767	20.47	0.668
17.80	0.961	18.70	0.865	19.60	0.763	20.50	0.666
17.83	0.958	18.73	0.861	19.63	0.760	20.53	0.663
17.87	0.954	18.77	0.857	19.67	0.756	20.57	0.661
17.90	0.951	18.80	0.854	19.70	0.752	20.60	0.658
17.93	0.947	18.83	0.850	19.73	0.748	20.63	0.656
17.97	0.944	18.87	0.846	19.77	0.744	20.67	0.654
18.00	0.940	18.90	0.842	19.80	0.740	20.70	0.653
18.03	0.937	18.93	0.839	19.83	0.737	20.73	0.651
18.07	0.933	18.97	0.835	19.87	0.733	20.77	0.649
18.10	0.930	19.00	0.831	19.90	0.729	20.80	0.648
18.13	0.926	19.03	0.828	19.93	0.725	20.83	0.646
18.17	0.923	19.07	0.824	19.97	0.721	20.87	0.645
18.20	0.919	19.10	0.820	20.00	0.717	20.90	0.644
18.23	0.915	19.13	0.816	20.03	0.713	20.93	0.643
18.27	0.912	19.17	0.813	20.07	0.710	20.97	0.642
18.30	0.908	19.20	0.809	20.10	0.706	21.00	0.641
18.33	0.905	19.23	0.805	20.13	0.702	21.03	0.640
18.37	0.901	19.27	0.801	20.17	0.698	21.07	0.639
18.40	0.897	19.30	0.798	20.20	0.694	21.10	0.638
18.43	0.894	19.33	0.794	20.23	0.691	21.13	0.637
18.47	0.890	19.37	0.790	20.27	0.687	21.17	0.637
18.50	0.887	19.40	0.786	20.30	0.684	21.20	0.636
18.53	0.883	19.43	0.782	20.33	0.680	21.23	0.635

Continues on next page...

4090-01 PRE-DEVT-EX-A UNIT HYDRO-TTM38710&11

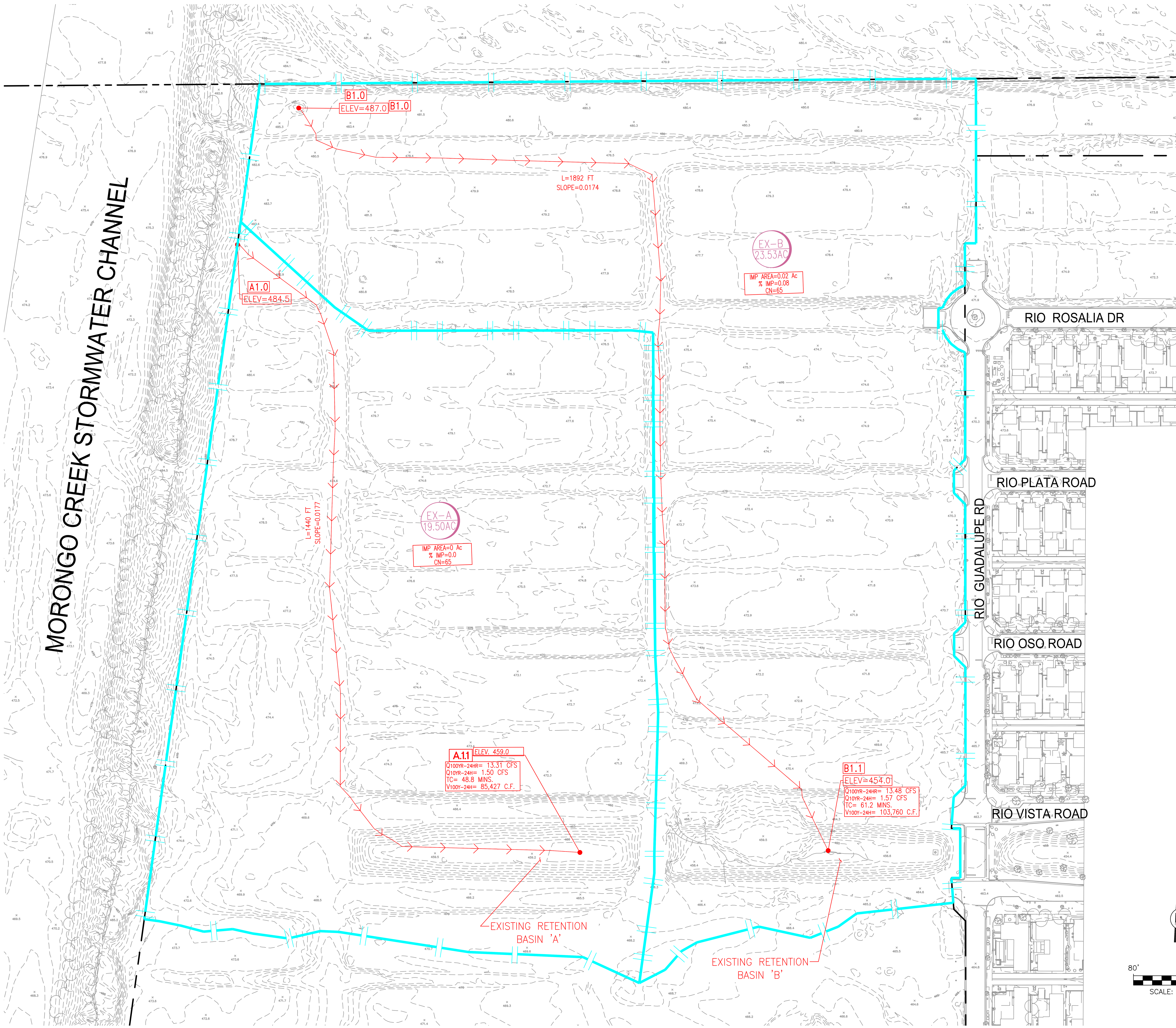
Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)	Time -- (hrs	Outflow cfs)
21.27	0.635	22.17	0.617	23.07	0.599	23.97	0.580
21.30	0.634	22.20	0.616	23.10	0.598	24.00	0.579
21.33	0.633	22.23	0.616	23.13	0.597	24.03	0.576
21.37	0.633	22.27	0.615	23.17	0.596	24.07	0.572
21.40	0.632	22.30	0.614	23.20	0.596	24.10	0.565
21.43	0.631	22.33	0.614	23.23	0.595	24.13	0.557
21.47	0.631	22.37	0.613	23.27	0.594	24.17	0.547
21.50	0.630	22.40	0.612	23.30	0.594	24.20	0.535
21.53	0.629	22.43	0.612	23.33	0.593	24.23	0.521
21.57	0.629	22.47	0.611	23.37	0.592	24.27	0.505
21.60	0.628	22.50	0.610	23.40	0.592	24.30	0.488
21.63	0.628	22.53	0.609	23.43	0.591	24.33	0.468
21.67	0.627	22.57	0.609	23.47	0.590	24.37	0.447
21.70	0.626	22.60	0.608	23.50	0.589	24.40	0.424
21.73	0.626	22.63	0.607	23.53	0.589	24.43	0.399
21.77	0.625	22.67	0.607	23.57	0.588	24.47	0.372
21.80	0.624	22.70	0.606	23.60	0.587	24.50	0.343
21.83	0.624	22.73	0.605	23.63	0.587	24.53	0.316
21.87	0.623	22.77	0.605	23.67	0.586	24.57	0.289
21.90	0.622	22.80	0.604	23.70	0.585	24.60	0.264
21.93	0.622	22.83	0.603	23.73	0.585	24.63	0.240
21.97	0.621	22.87	0.603	23.77	0.584	24.67	0.217
22.00	0.620	22.90	0.602	23.80	0.583	24.70	0.195
22.03	0.620	22.93	0.601	23.83	0.582	24.73	0.175
22.07	0.619	22.97	0.601	23.87	0.582	24.77	0.155
22.10	0.618	23.00	0.600	23.90	0.581	24.80	0.137
22.13	0.618	23.03	0.599	23.93	0.580		

...End

APPENDIX 5

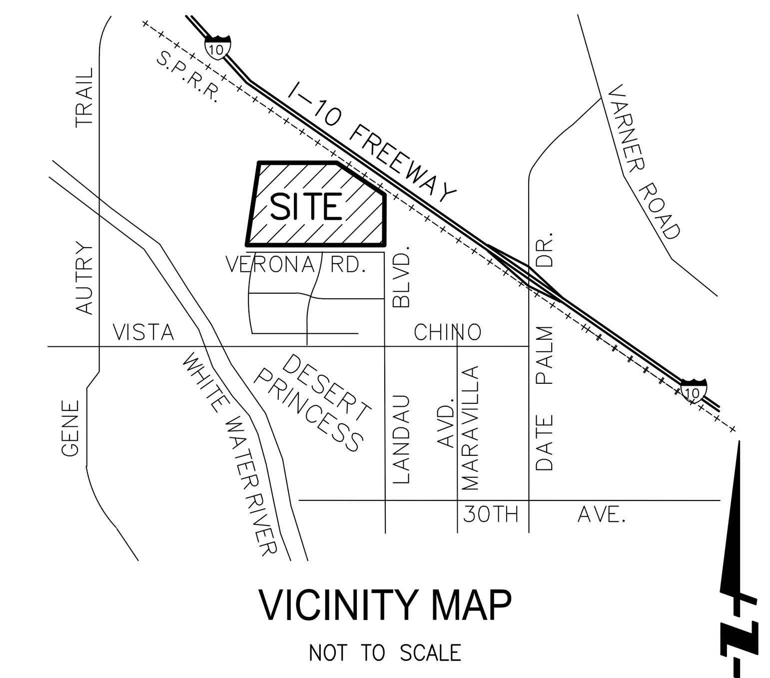
PRE/POST DEVELOPMENT HYDROLOGY MAPS
POST DEVELOPMENT UNIT HYDROGRAPH MAP
STORM DRAIN & CATCH BASIN EXHIBIT



PRE-DEVELOPMENT DRAINAGE MAP

CATHEDRAL CITY, CA

TTM - 38710 & 38711



VICINITY MAP
NOT TO SCALE

ASSESSORS PARCEL NUMBERS:

APN: 677-050-032, 677-050-033, 677-050-034

OWNER/DEVELOPER:

NCP VERANO, LLC
690 E GREEN STREET, SUITE 200
PASADENA, CA 91101
(323)874-8000

CIVIL ENGINEER:

FUSCOE ENGEERING, INC.
2850 INLAND EMPIRE BLVD, SUITE B
ONTARIO, CA 91764
(909)581-0676

LEGEND

AREA BOUNDARY

SUB AREA
DA
AC
SUB-AREA (ACRES)
AREA NODE

FLOW

DRAINAGE AREA SUMMARY

DRAINAGE AREA	AREA, AC	IMPERVIOUS AREA, AC	% IMP	CN
EX-A	19.50	0.00	0.00	65
EX-B	23.53	0.02	0.08	65

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

PREPARED BY:

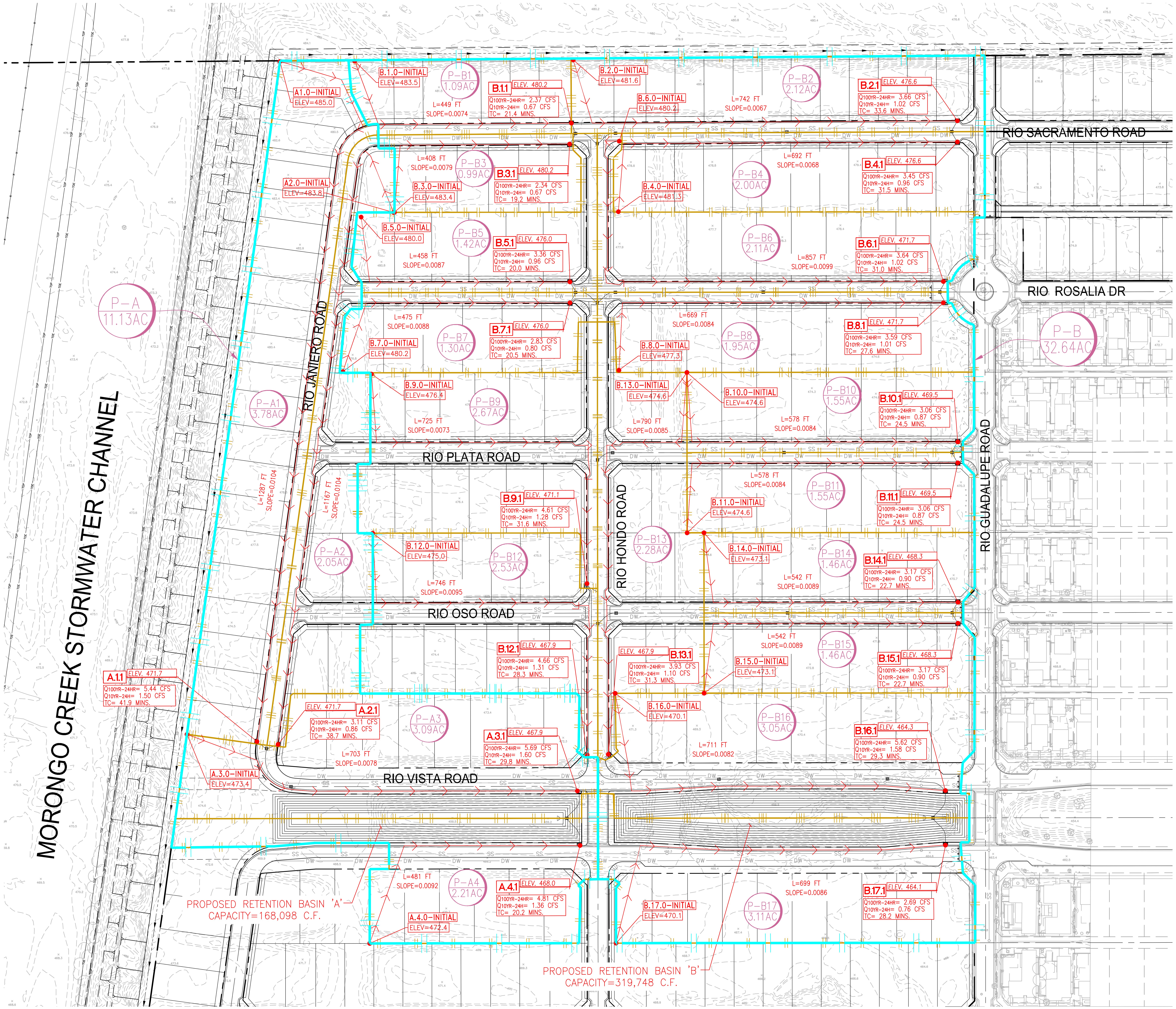
MAY, 2023

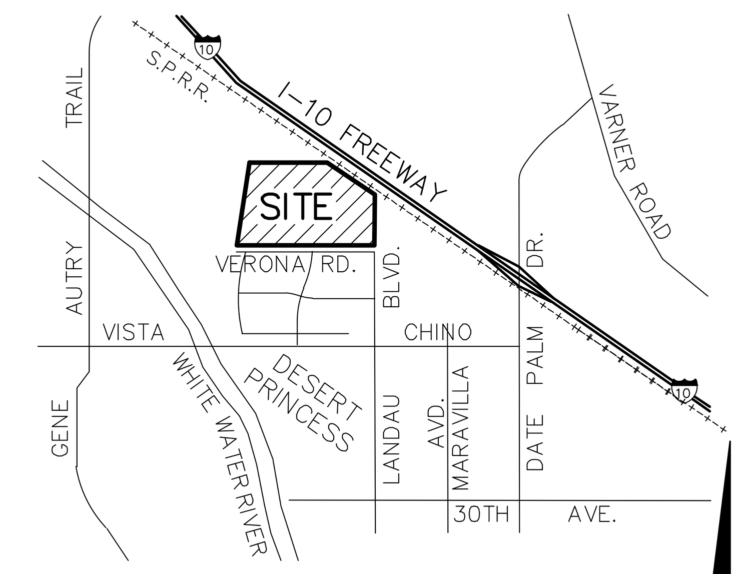
FUSCOE ENGINEERING
full circle thinking

POST-DEVELOPMENT DRAINAGE MAP

CATHEDRAL CITY, CA

TTM - 38710 & 38711





VICINITY MAP

NOT TO SCALE

ASSESSORS PARCEL NUMBERS:

APN: 677-050-032, 677-050-033, 677-050-034

OWNER/DEVELOPER:

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690 E GREEN STREET, SUITE 200
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CIVIL ENGINEER:

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2850 INLAND EMPIRE BLVD, SUITE B
ONTARIO, CA 91764
(909)581-0676

LEGEND

AREA BOUNDARY

SUB-DRAINAGE AREA BOUNDARY

SUB AREA / DA / AC / SUB-AREA (ACRES) — AREA NODE

FLOW

DRAINAGE AREA SUMMARY

DRAINAGE AREA	AREA, AC	IMPERVIOUS AREA, AC	% IMP	CN
P-A	11.13	7.23	0.65	77
P-B	32.64	21.22	0.65	77

80' 0' 40' 80'

SCALE: 1" = 80'

PREPARED BY:

MAY, 2023

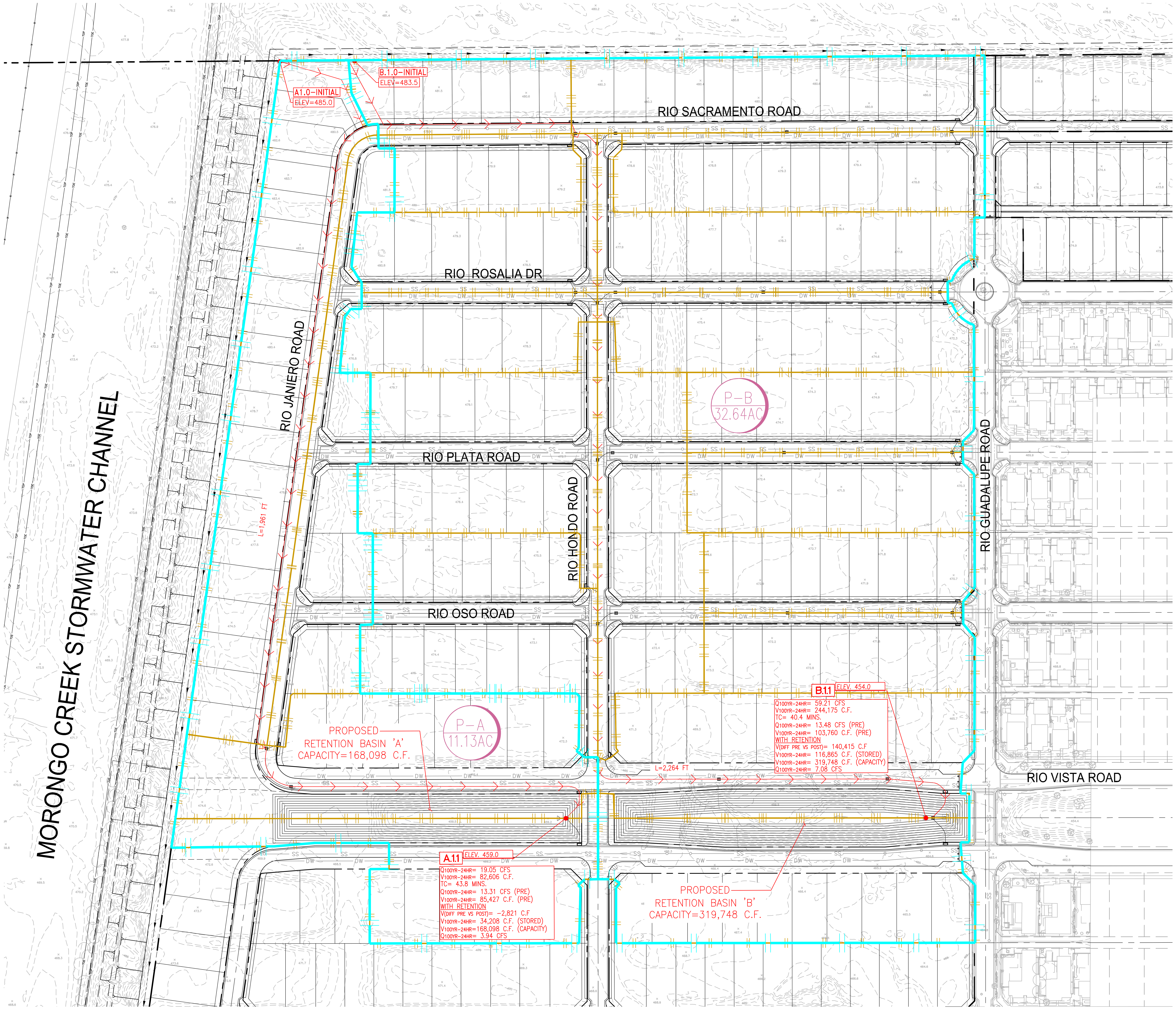
FUSCOE ENGINEERING

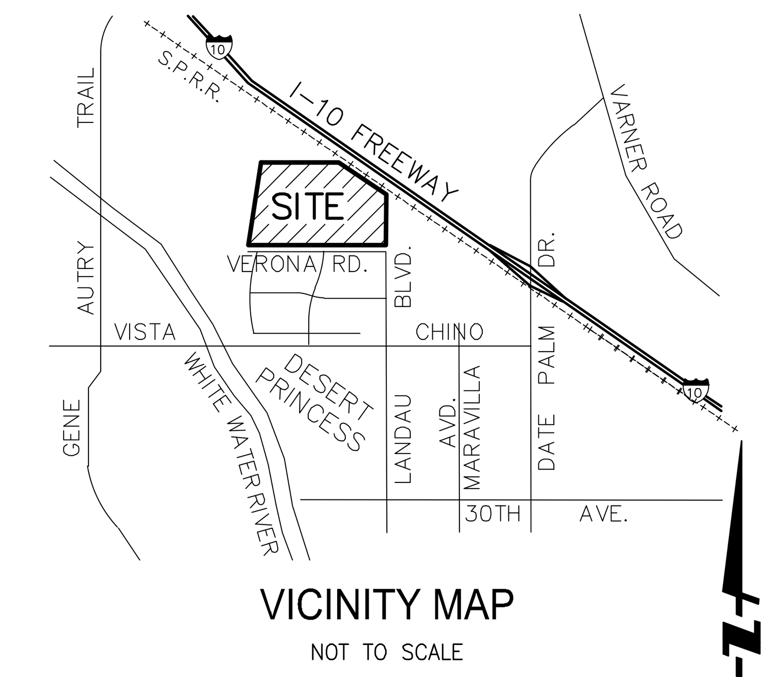
full circle thinking

POST-DEVELOPMENT UNIT HYDROGRAPH

CATHEDRAL CITY, CA

TTM - 38710 & 38711





VICINITY MAP

NOT TO SCALE

ASSESSORS PARCEL NUMBERS:

APN: 677-050-032, 677-050-033, 677-050-034

OWNER/DEVELOPER:

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ONTARIO, CA 91764
(909)581-0676

LEGEND

AREA BOUNDARY

SUB-DRAINAGE AREA BOUNDARY

SUB AREA
DA
AC
SUB-AREA (ACRES)
AREA NODE

FLOW

DRAINAGE AREA SUMMARY

DRAINAGE AREA	AREA, AC	IMPERVIOUS AREA, AC	% IMP	CN
P-A	11.13	7.23	0.65	77
P-B	32.64	21.22	0.65	77

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

PREPARED BY:

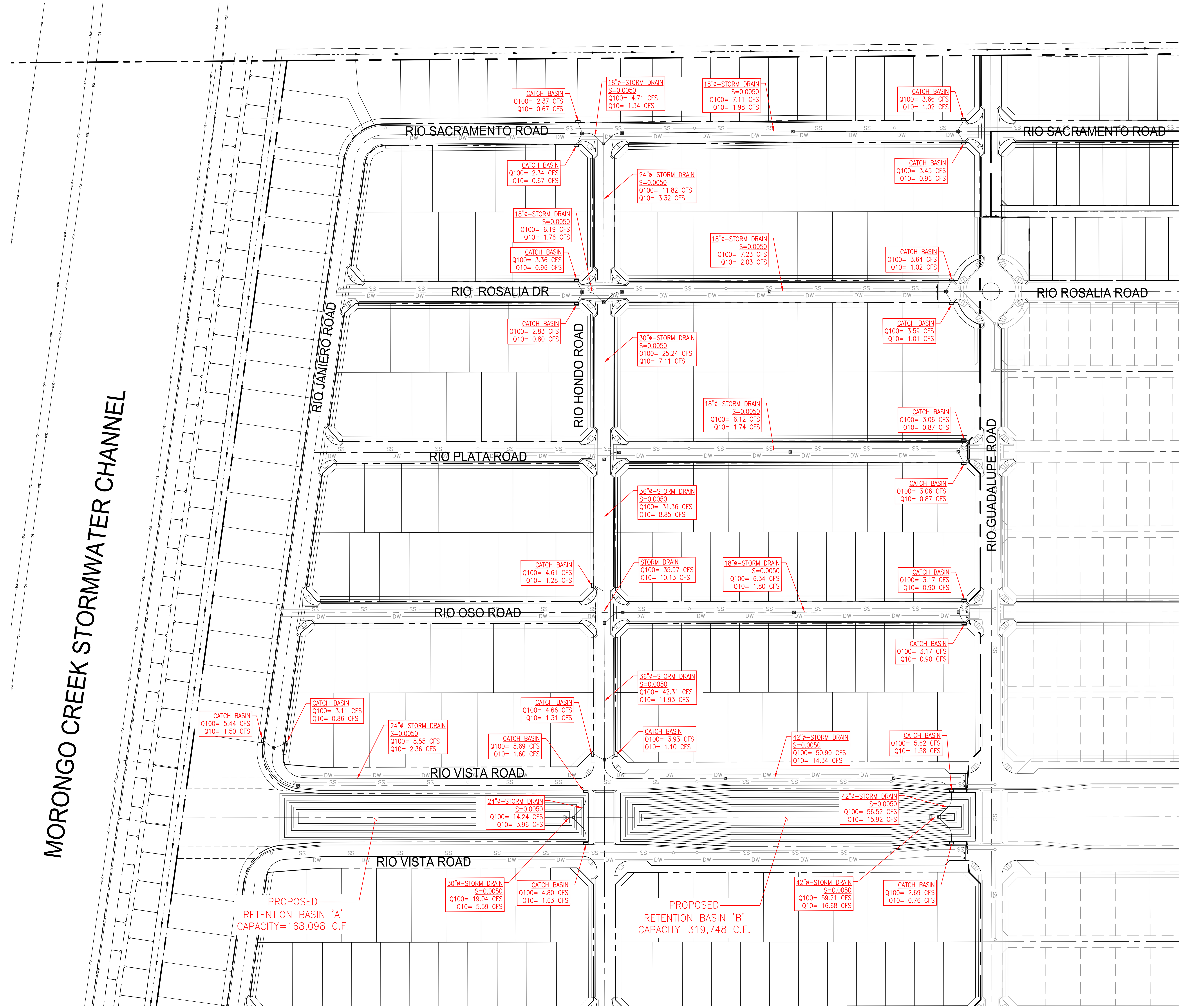
MAY, 2023

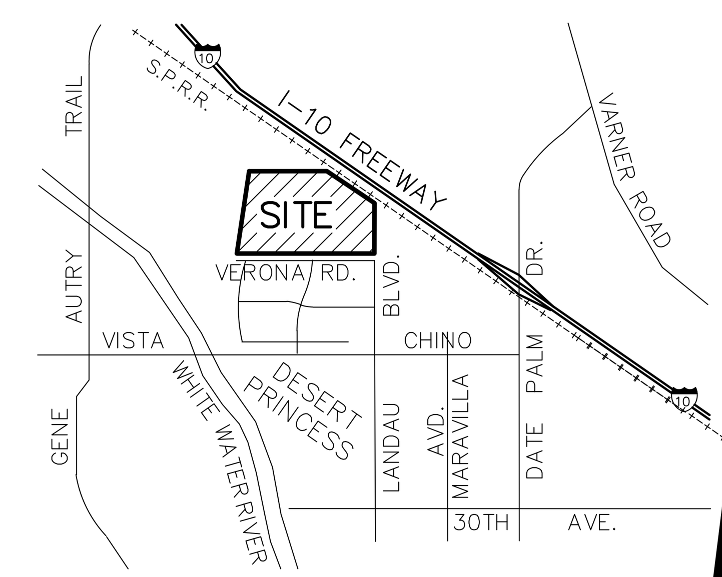
FUSCOE ENGINEERING
full circle thinking

POST-DEVELOPMENT CATCH BASIN AND STORM DRAIN EXHIBIT

CATHEDRAL CITY, CA

TTM - 38710 & 38711





VICINITY MAP

NOT TO SCALE

ASSESSORS PARCEL NUMBERS:

APN: 677-050-032, 677-050-033, 677-050-034

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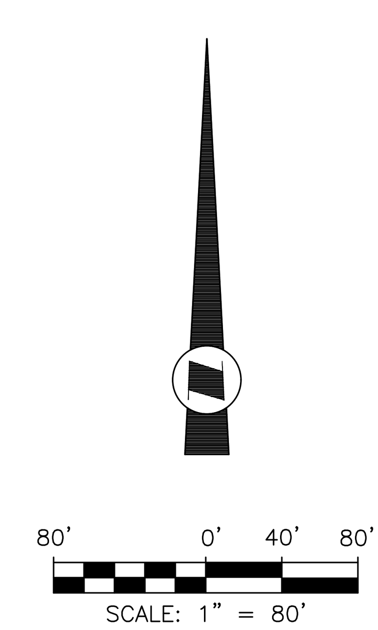


PREPARED BY:

MAY, 2023

FUSCOE ENGINEERING

full circle thinking

APPENDIX 6

STORM DRAIN SIZING

Channel Report

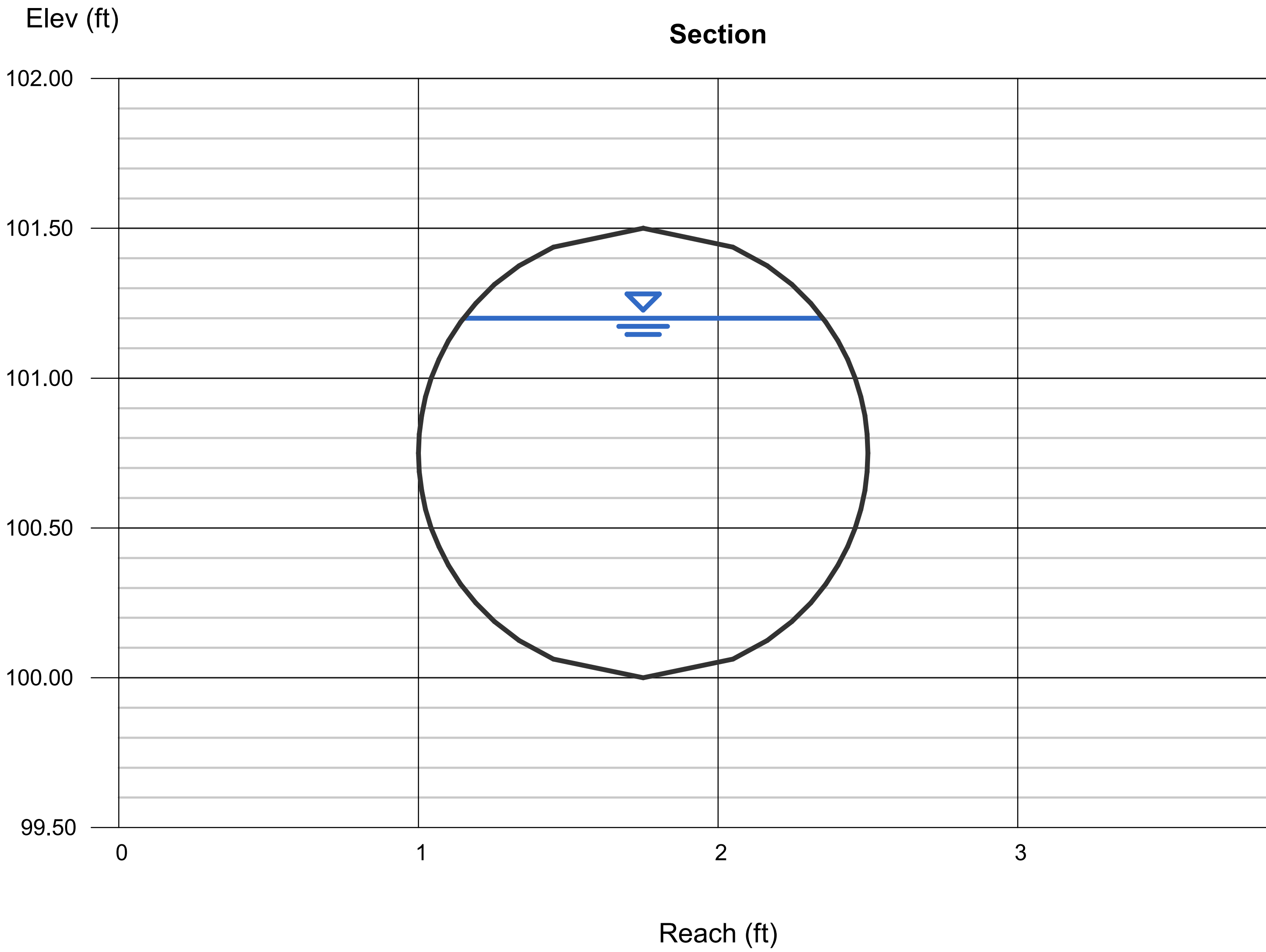
4090-01 TTM 38710-11 - 18 IN PIPE - Q100MAX=7.23 CFS -S=0.0050

Circular
Diameter (ft) = 1.50

Invert Elev (ft) = 100.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Known Q
Known Q (cfs) = 7.23

Highlighted
Depth (ft) = 1.20
Q (cfs) = 7.230
Area (sqft) = 1.52
Velocity (ft/s) = 4.77
Wetted Perim (ft) = 3.32
Crit Depth, Yc (ft) = 1.05
Top Width (ft) = 1.20
EGL (ft) = 1.55



Channel Report

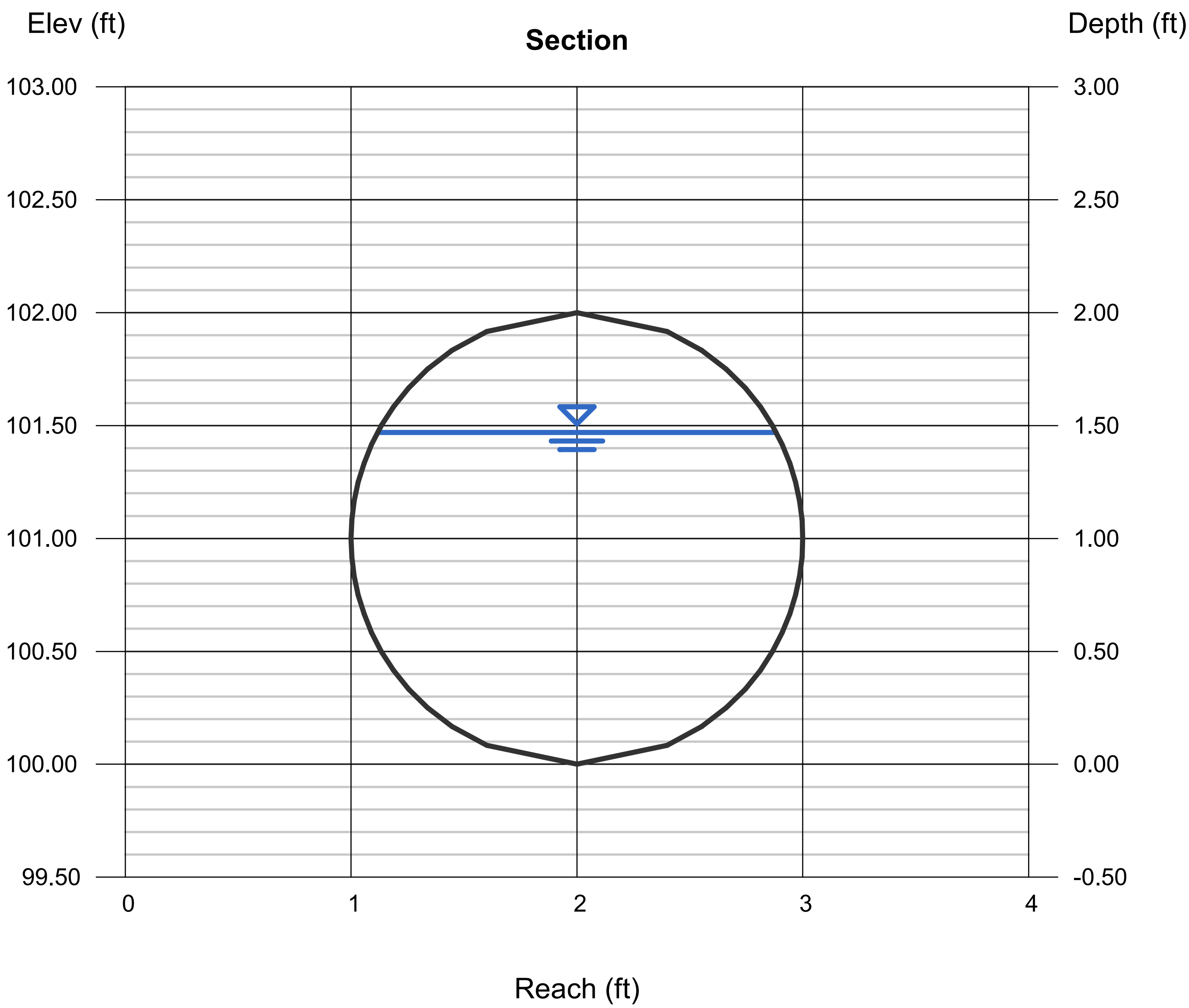
4090-01 TTM 38710-11 - 24 IN PIPE - Q100MAX=14.24 CFS -S=0.0050

Circular
Diameter (ft) = 2.00

Invert Elev (ft) = 100.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Known Q
Known Q (cfs) = 14.24

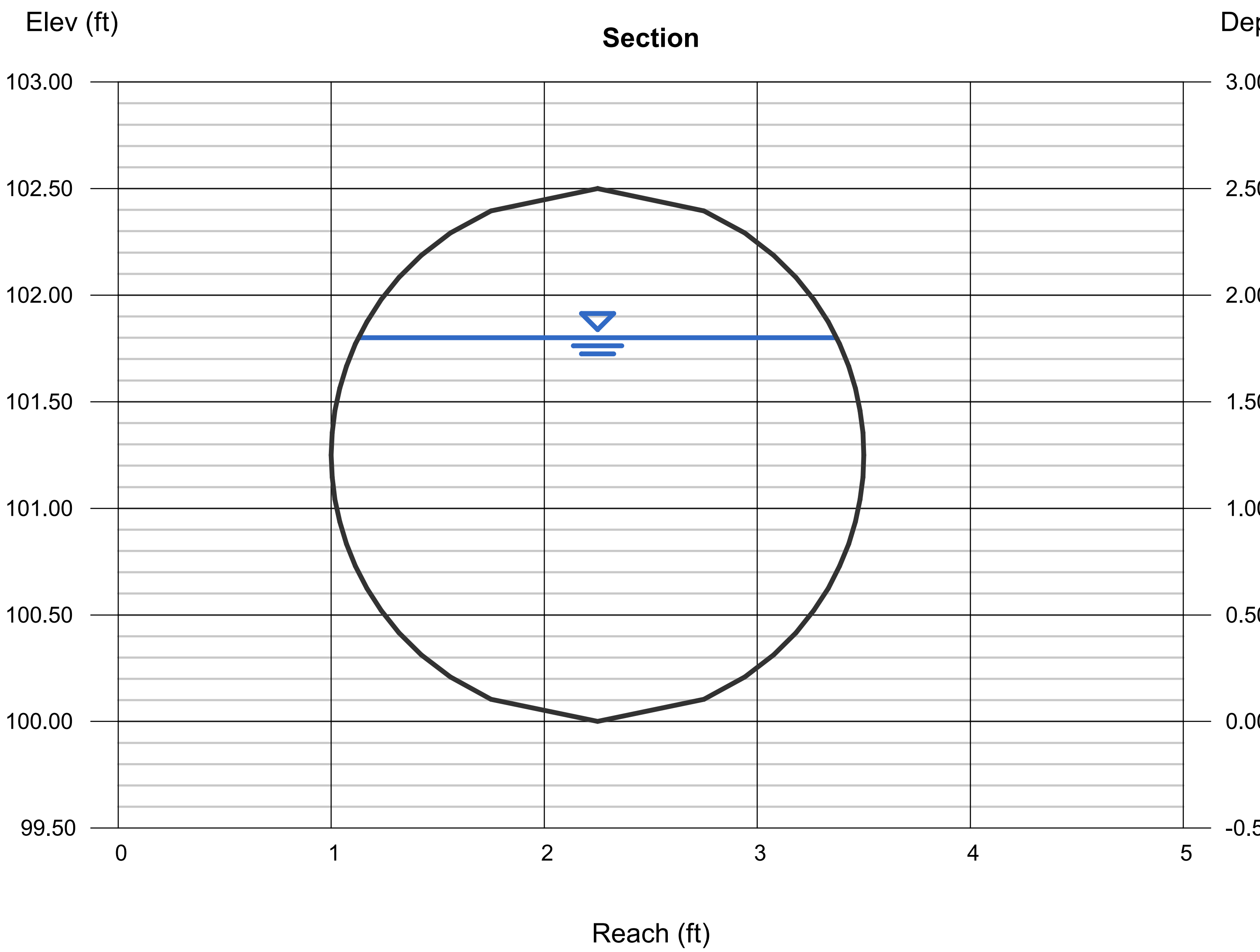
Highlighted
Depth (ft) = 1.47
Q (cfs) = 14.24
Area (sqft) = 2.48
Velocity (ft/s) = 5.74
Wetted Perim (ft) = 4.13
Crit Depth, Yc (ft) = 1.36
Top Width (ft) = 1.76
EGL (ft) = 1.98



Channel Report

4090-01 TTM 38710-11 - 30 IN PIPE - Q100MAX=25.24 CFS -S=0.0050

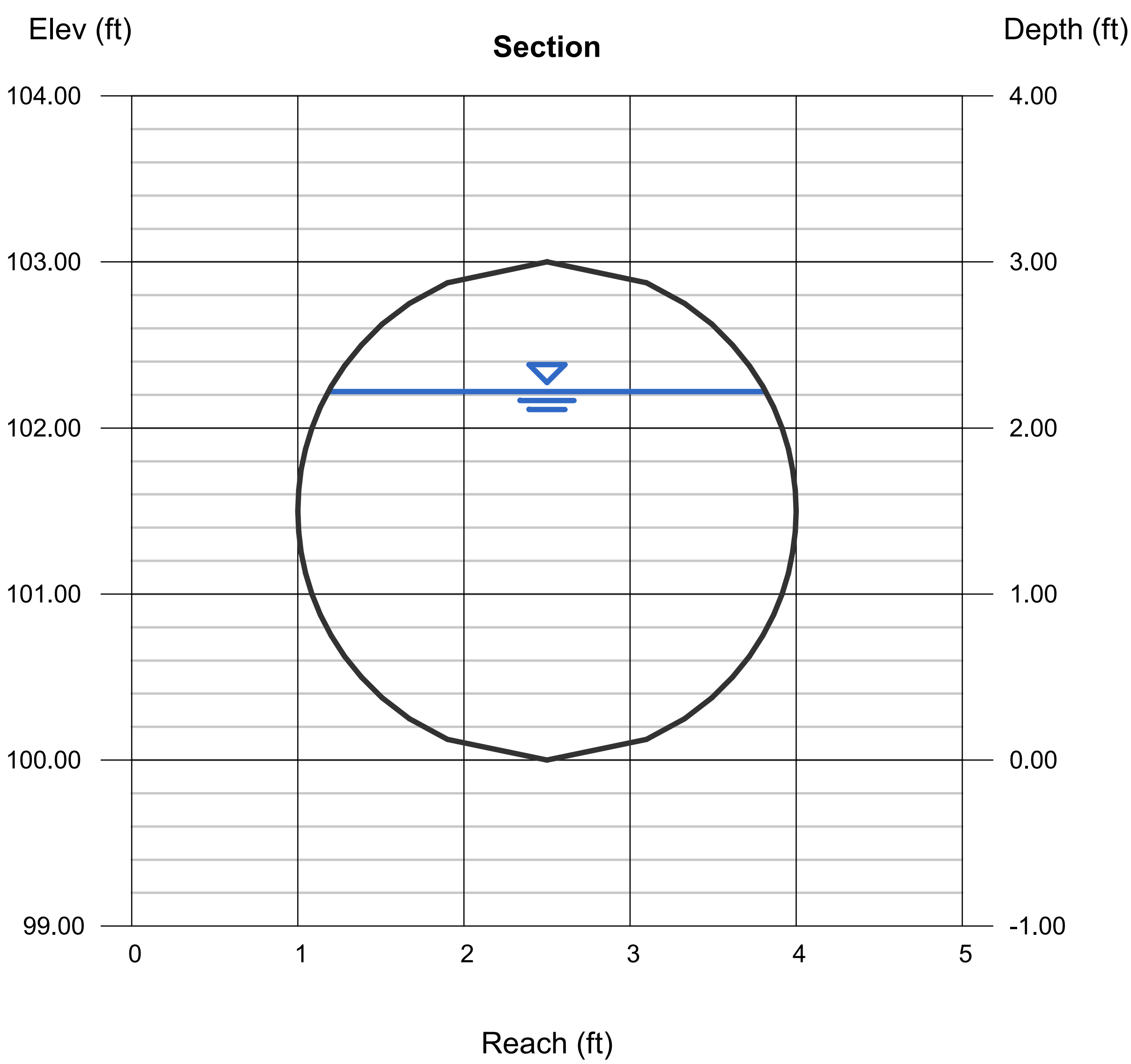
Circular		**Highlighted**	
Diameter (ft)	= 2.50	Depth (ft)	= 1.80
		Q (cfs)	= 25.24
		Area (sqft)	= 3.79
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 6.65
Slope (%)	= 0.50	Wetted Perim (ft)	= 5.07
N-Value	= 0.013	Crit Depth, Yc (ft)	= 1.71
		Top Width (ft)	= 2.24
Calculations		EGL (ft)	= 2.49
Compute by:	Known Q		
Known Q (cfs)	= 25.24		



Channel Report

4090-01 TTM 38710-11 - 36 IN PIPE - Q100MAX=42.31 CFS -S=0.0050

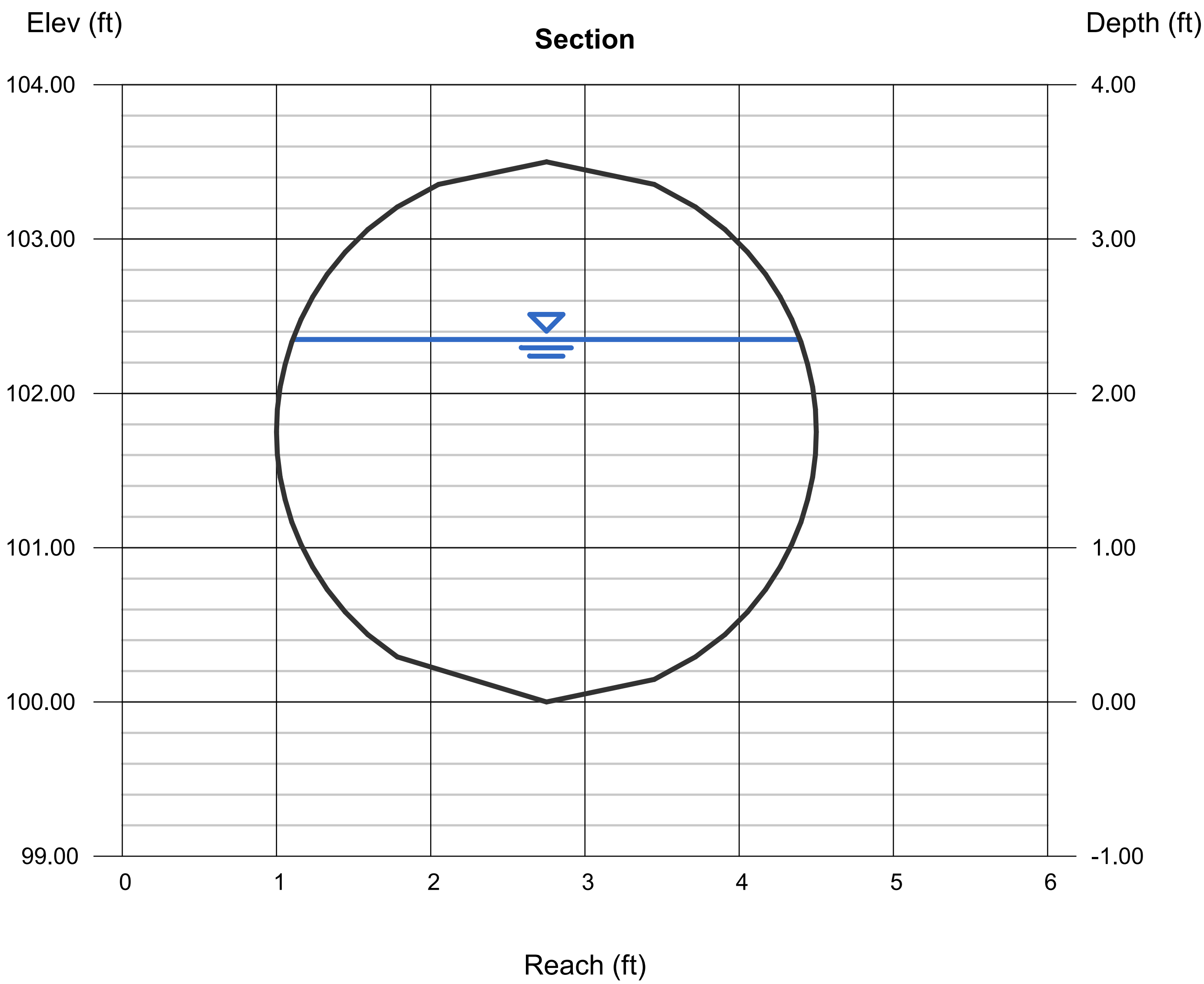
Circular		**Highlighted**	
Diameter (ft)	= 3.00	Depth (ft)	= 2.22
		Q (cfs)	= 42.31
		Area (sqft)	= 5.62
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 7.53
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.23
N-Value	= 0.013	Crit Depth, Yc (ft)	= 2.12
		Top Width (ft)	= 2.63
Calculations		EGL (ft)	= 3.10
Compute by:	Known Q		
Known Q (cfs)	= 42.31		



Channel Report

4090-01 TTM 38710-11 - 42 IN PIPE - Q100MAX=56.52 CFS -S=0.0050

Circular		**Highlighted**	
Diameter (ft)	= 3.50	Depth (ft)	= 2.35
		Q (cfs)	= 56.52
		Area (sqft)	= 6.89
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 8.20
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.74
N-Value	= 0.013	Crit Depth, Yc (ft)	= 2.35
		Top Width (ft)	= 3.28
Calculations		EGL (ft)	= 3.40
Compute by:	Known Q		
Known Q (cfs)	= 56.52		



APPENDIX 7

EXCERTPS FROM APPROVED MASTER DRAINAGE REPORT FOR TRACT 28639-1 AND M-WQMP FOR RIO VISTA VILLAGE (FOR REFERENCE ONLY)

Project Specific
Master WQMP for Rio Vista Village

For: **Rio Vista Village**

NW Corner of Landau Blvd. & Verona Blvd.

DEVELOPMENT NO. **Tract 28639-1, PM 34148, Specific Plan 97-55**
DESIGN REVIEW NO.

Prepared for:
Verano Recovery, LLC; Portales Recovery, LLC; Cassia at Rio Vista Recovery; Sol Recovery, LLC
Contact: Inland Communities Corp.
Attn: Mohamad Younes, P.E., Senior Vice President
6430 W. Sunset Boulevard, Suite 460
Los Angeles, California 90028
Telephone: (323) 874-8000

Prepared by:
Joyce Goode and Chris Ogaz
Under direction of:
Jeffrey D. Endicott, PE, BCEE, CPESC
CASC Engineering and Consulting, Inc.
77-567 Country Club Drive, Suite 211
Palm Desert, CA 92211
Telephone: (760) 259-0108, Ext 5380

REGISTERED PROFESSIONAL ENGINEER
JEFFREY DUANE ENDICOTT
No. C 040658
Exp. 3-31-2017
CIVIL
STATE OF CALIFORNIA
8-4-2015

Please send correspondence to our Corporate Office:
1470 E. Cooley Drive
Colton, California 92324

Original Date Prepared: April 29, 2015

OWNER'S CERTIFICATION

This project-specific Water Quality Management Plan (WQMP) has been prepared for:

Verano Recovery, LLC; Portales Recovery, LLC; Cassia at Rio Vista Recovery; Sol Recovery, LLC; & Los Portales Recovery, LLC
by **Inland Communities Corp.**
for the project known as **Rio Vista Village** at northwest corner of Landau Boulevard and Verona Boulevard.

This WQMP is intended to comply with the requirements of **Cathedral City** for **Tract 28639-1 and Parcel Map 34148** which includes the requirement for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under **Cathedral City** Water Quality Ordinance (Municipal Code Section 8.24.070).

If the undersigned transfers its interest in the subject property/project, the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that I am the authorized signatory on behalf of the owner of the property that is the subject of this WQMP, and that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Authorized Signature

Mohamad Younes, P.E.
Owner's Authorized Printed Name

Senior Vice President
Owner's Title/Position

8/4/2015
Date

Its managing member:
Inland Communities Corp.
6430 W. Sunset Boulevard, Suite 460
Los Angeles, California 90028
Telephone: (323) 874-8000

ATTEST

Notary Signature

Dale Martinez III
Printed Name

Notary Public
Title/Position

8/4/15
Date

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Riverside)

On Agst 4, 2015 before me, Dale Martinez III, Notary Public,
Date *Here Insert Name and Title of the Officer*

personally appeared Mohamad Younes
Name~~(s)~~ of Signer~~(s)~~

who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she~~/~~they~~ executed the same in his/~~her~~/~~their~~ authorized capacity~~(ies)~~, and that by his/~~her~~/~~their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

DALE MARTINEZ III
Commission # 2107127
Notary Public - California
Riverside County
My Comm. Expires Apr 16, 2019

Signature Dale M III
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: ______ Document Date: ______

Number of Pages: ______ Signer(s) Other Than Named Above: ______

Capacity(ies) Claimed by Signer(s)

Signer's Name: ______	Signer's Name: ______
☐ Corporate Officer — Title(s): ______	☐ Corporate Officer — Title(s): ______
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: ______	☐ Other: ______
Signer Is Representing: ______	Signer Is Representing: ______

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Contents

TABLES

APPENDICES

I. Project Description

Project Owner: Verano Recovery, LLC
Attn: Mohamad Younes, P.E.
c/o Inland Communities Corp.
6430 W. Sunset Boulevard, Suite 460
Los Angeles, CA 90028
(323) 874-8000

WQMP Preparer: CASC Engineering and Consulting, Inc.
77-567 Country Club Drive, Suite 211
Palm Desert, CA 92211
Office: (760) 259-0108

Project Site Address: **NW Corner of Landau Blvd & Verona Rd**
Cathedral City, CA

Planning Area/
Community Name/
Development Name: **Rio Vista Village - Master WQMP**

APN Number(s): To be included in F-WQMP phased developments

Latitude & Longitude: **33.8556, -116.4824**

Receiving Water: **Whitewater River to Coachella Valley Storm Water Channel**

Project Site Size: **290.91 ac**

Standard Industrial Classification (SIC) Code: **1521, Single Family Homes**
1522, Multi-Family Use

Formation of Home Owners' Association (HOA)
or Property Owners Association (POA): Y ☒ N ☐

Additional Permits/Approvals required for the Project:

AGENCY	Permit required
State Department of Fish and Wildlife, Fish and Game Code §1602 Streambed Alteration Agreement	Y ☐ N☒
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Certification	Y ☐ N☒
US Army Corps of Engineers, CWA Section 404 permit	Y ☐ N☒
US Fish and Wildlife, Endangered Species Act Section 7 biological opinion	Y ☐ N☒
Statewide Construction General Permit Coverage	Y ☒ N☐
Statewide Industrial General Permit Coverage	Y ☐ N☒
Other *(please list in the space below as required)*	

Rio Vista Village Master WQMP

The project proposes to develop an overall Master WQMP (M-WQMP) with area specific Final WQMPs (F-WQMP) to address potential water quality issues. The Master WQMP will function as the conceptual water quality plan for the entire project. It will identify all drainage areas and retention facilities for the purpose of water quality (See Appendix B, M-WQMP Site Exhibit). This conceptual master plan will also incorporate existing developed areas and proposed areas into the sizing calculations for water quality purposes. As phases of Rio Vista Village progress towards permitting and construction, F-WQMPs will be prepared for each phase and will identify the specific features to be incorporated into the project to address water quality protection requirements. Features may include a combination of existing and/or newly proposed features. Existing and proposed developments will include, but not be limited to, public and private roads and alley ways, common parking areas, drainage patterns, catch basins, onsite storm drain systems, retention areas, common space areas, and pervious surfaces. Appendix J of the M-WQMP will be an amendment section where future phases of development will be logged.

Rio Vista Village is located on the northwest corner of Landau Boulevard and Verona Road in Cathedral City. The project is bounded by the Southern Pacific Railroad Right-of-Way to the North, Verona Road to the South, Landau Boulevard to the East, and Morongo Creek Stormwater Channel to the west. It is currently under the ownership of several different LLCs. An aerial photo overlay map distinguishing ownership is provided in Appendix B. An HOA has been formed for Rio Vista Village. CC&Rs are included in Appendix G. The Remainder Parcel of Tract 28639-1 (Parcel Map 34148) is a part of the annexable territory was not incorporated into the HOA. This area will need to be incorporated into the HOA upon proposed development.

The total area of the project is 290.91 acres, as shown on the tract map for Tract 28639-1 in Appendix B. Approximately 26.7 acres of the western portion of the property is located within the Morongo Creek Stormwater Channel. This area slopes towards the channel and contributes no runoff to the development; therefore, it has been excluded from the WQMP, M-WQMP Site Exhibit, and drainage studies. Overflows associated with the project discharge from the site to the east onto Landau Boulevard and is conveyed by the MS4 to the Whitewater River. Flows from the Whitewater River ultimately discharge to the Coachella Valley Storm Water Channel.

The western portion of the site has been previously graded; however, it remains vacant, desert terrain sloping to the southeast. The eastern portion of the property has been partially developed. Existing development includes open space areas, retention basins, utilities, catch basins, onsite storm drain systems, public roads and alley ways, common parking areas, a community center (Lot 294 of Tract Map 28639-1), and completed existing single family residences. Existing single family residences are located on Lots 1-3, 17-28, 42-56, 61-63, 65-71, 73-98, 106-132, 133-144 of Tract Map 28639-1. The overall project will construct approximately 1,362 single family residential lots, associated streets, utilities, landscaping and retention areas.

The geotechnical investigation reported loose soils throughout the upper 3 to 4 feet of underlying soils with soils becoming firmer with depth. Moisture content of samples were low, ranging between 0.5 to 1.5 percent. Groundwater was cited to be in exceedance of 200’ below the surface. The geotechnical report is located in Appendix E.

A drainage report for the project was prepared and has been included in Appendix F. A total of twelve drainage areas and twelve retention areas were identified for retention of the entire 100-year, 24-hour storm event. Flows exceeding the 100-yr, 24-hr event will pond and discharge to the east onto Landau Boulevard. Typical details of retention areas are provided on the Master Site

Map in Appendix B. Basins A through Basin G are located in the center of Rio Vista Boulevard. Discharge from the onsite storm drains directly enter into existing drywells of Basins C, D, F, G and I. Overflows from the dry wells will pond up into the basin area. Runoff will be conveyed via the onsite storm drains and directly discharge into existing Basins G, H1, H2, and H4 Retention volumes and a water surface for Basin B were include in the drainage study. A design showing how discharges enter this basin will need to be addressed as Drainage Area B is developed. Drainage Area A/ Retention Area A and Lots 299, 300 and 277 of Tract 28639-1 were not included in the hydrology report. When these areas are developed, a hydrology report will be prepared and included in the F-WQMP. See Appendix B Master WQMP Site Map for all retention area locations.

Infiltration testing cited a rate of 8.94 in/hr (Appendix F, Basic Infiltration Testing Report). Calculations were prepared using the infiltration rate and volumes based on the 100-yr, 24-hr storm event per the hydrology study. See Appendix F, Infiltration Basin Worksheets. The calculations demonstrate that the design of the basins provide adequate surface area to infiltrate for this event within 36 hours. The design of the existing basins exceed current NPDES WQMP requirements. Cathedral City Municipal Code – Title 8 § 8.24.070 requires the retention/detention of the 100-year, 3-hour storm events. The design capture volume of the retention areas surpasses this volume. Therefore, the project is not subject to the HCOC provisions of the WQMP and the project satisfies 100% of the LID/ site design measurable goal.

Appendix A of this project-specific WQMP includes a complete copy of the final Conditions of Approval. Appendix B of this project-specific WQMP includes:

a. A Vicinity Map identifying the project site and surrounding planning areas in sufficient detail; and

b. A Site Plan for the project. The Site Plan included as part of Appendix B depicts the following project features:

- Location and identification of all structural BMPs, including Source Control, LID/Site Design and Treatment Control BMPs.
- Landscaped areas.
- Paved areas and intended uses (i.e., parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.).
- Number and type of structures and intended uses (i.e., buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.).
- Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation.
- Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.
- Location(s) of Receiving Waters to which the project directly or indirectly discharges.

- Location of points where onsite (or tributary offsite) flows exit the property/project site.
- Delineation of proposed drainage area boundaries, including tributary offsite areas, for each location where flows exit the project site and existing site (where existing site flows are required to be addressed). Each tributary area should be clearly denoted.
- Pre- and post-project topography.

Appendix I is a one page form that summarizes pertinent information relative to this project-specific WQMP.

II. Site Characterization

Land Use Designation or Zoning:	**R1 (Single Family Residential) and R3 (Multiple Family Residential)**
Current Property Use:	**Partially Developed, Partially Vacant**
Proposed Property Use:	**Single and Multiple Family Residential**
Availability of Soils Report:	Y ☒ N ☐ *Note: A soils report is required if infiltration BMPs are utilized. Attach report in Appendix E.*
Phase 1 Site Assessment:	Y ☐ N ☒ *Note: If prepared, attached remediation summary and use restrictions in Appendix H.*

Receiving Waters for Urban Runoff from Site

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use Designated Receiving Waters
Whitewater River	-	MUN, AGR, GWR, RECI, RECII, WARM, COLD, WILD, POW	-
Coachella Valley Stormwater Channel	DDT, Dieldrin, PCBs, Pathogens, Toxaphene	FRESH, RECI, RECII, WARM, WILD, RARE	19.43 miles

III. Pollutants of Concern

Table 1. Pollutant of Concern Summary

Pollutant Category	Potential for Project and/or Existing Site	Causing Receiving Water Impairment
Bacteria/Virus	X	X
Heavy Metals	X	
Nutrients	X	
Toxic Organic Compounds	X	
Sediment/Turbidity	X	
Trash & Debris	X	
Oil & Grease	X	
Other (specify pollutant):		
Other (specify pollutant):		

Pathogens are identified in the Colorado River Basin 303(d) Impaired Waterbody List. Pathogens have been identified as a potential pollutant. The implementation of retention basins will mitigate potential discharges with a high removal efficiency.

IV. Hydrologic Conditions of Concern

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

Yes ☒ The project will be required to retain urban runoff onsite in conformance with local ordinance (See Table 6 of the WQMP Guidance document, "Local Land use Authorities Requiring Onsite Retention of Stormwater"). This section does not need to be completed; however, retention facility design details and sizing calculations must be included in Appendix F.

No ☐ This section must be completed.

This Project meets the following condition:

☐ **Condition A**: 1) Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4 or engineered and maintained channel, 2) the discharge is in full compliance with local land use authority requirements for connections and discharges to the MS4 (including both quality and quantity requirements), 3) the discharge would not significantly impact stream habitat in proximate Receiving Waters, **and** 4) the discharge is authorized by the local land use authority.

☐ **Condition B**: The project disturbs less than 1 acre and is not part of a larger common plan of development that exceeds 1 acre of disturbance. The disturbed area calculation must include all disturbances associated with larger plans of development.

☐ **Condition C**: The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by, where applicable, complying with the local land use authority's on-site retention ordinance, or minimizing impervious area on a site and incorporating other Site-Design BMP concepts and LID/Site Design BMPs that assure non-exceedance of pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the local land use authority.

☐ **None:** Refer to Section 3.4 of the Whitewater River Region WQMP Guidance document for additional requirements.

Supporting engineering studies, calculations, and reports are included in Appendix C.

	2 year – 24 hour		10 year – 24 hour	
	Precondition	**Post-condition**	**Precondition**	**Post-condition**
Discharge (cfs)				
Velocity (fps)				
Volume (cubic feet)				
Duration (minutes)				

V. Best Management Practices

This project implements Best Management Practices (BMPs) to address the Pollutants of Concern that may potentially be generated from the use of the project site areas. These BMPs have been selected and implemented to comply with Section 3.5 of the WQMP Guidance document, and consist of Site Design BMP concepts, Source Control, LID/Site Design and, if/where necessary, Treatment Control BMPs as described herein.

V.1 Site Design BMP Concepts, LID/Site Design and Treatment Control BMPs

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

Yes ☒ The project will be required to retain Urban Runoff onsite in conformance with local ordinance (See Table 6 of the WQMP Guidance document, "Local Land use Authorities Requiring Onsite Retention of Stormwater). **The LID/Site Design measurable goal has thus been met (100%), and Sections V.1.A and V.1.B do not need to be completed**; however, retention facility design details and sizing calculations must be included in Appendix F, and '100%' should be entered into Column 3 of Table 6 below.

No ☐ Section V.1 must be completed.

This section of the Project-Specific WQMP documents the LID/Site Design BMPs and, if/where necessary, the Treatment Control BMPs that will be implemented on the project to meet the requirements detailed within Section 3.5.1 of the WQMP Guidance document. Section 3.5.1 includes requirements to implement Site Design Concepts and BMPs, and includes requirements to address Pollutants of Concern with BMPs. Further, sub-section 3.5.1.1 specifically requires that Pollutants of Concern be addressed with <u>LID/Site Design</u> BMPs to the extent feasible.

LID/Site Design BMPs are those BMPs listed within Table 2 below which promote retention and/or feature a natural treatment mechanism; off-site and regionally-based BMPs are also LID/Site Design BMPs, and therefore count towards the measurable goal, if they fit these criteria. This project incorporates LID/Site Design BMPs to fully address the Treatment Control BMP requirement where and to the extent feasible. If and where it has been acceptably demonstrated to the local land use authority that it is infeasible to fully meet this requirement with LID/Site Design BMPs, Section V.1.B (below) includes a description of the conventional Treatment Control BMPs that will be substituted to meet the same requirements.

In addressing Pollutants of Concern, BMPs are selected using Table 2 below.

Table 2. BMP Selection Matrix Based Upon Pollutant of Concern Removal Efficiency (1)

(Sources: Riverside County Flood Control & Water Conservation District Design Handbook for Low Impact Development Best Management Practices, dated September 2011, the Orange County Technical Guidance Document for Water Quality Management Plans, dated May 19, 2011, and the Caltrans Treatment BMP Technology Report, dated April 2010 and April 2008)

Pollutant of Concern	Landscape Swale[2, 3]	Landscape Strip[2, 3]	Biofiltration (with underdrain)[2, 3]	Extended Detention Basin[2]	Sand Filter Basin[2]	Infiltration Basin[2]	Infiltration Trench[2]	Permeable Pavement[2]	Bioretention (w/o underdrain)[2, 3]	Other BMPs Including Proprietary BMPs[4, 6]
Sediment & Turbidity	M	M	H	M	H	H	H	H	H	Varies by Product[5]
Nutrients	L/M	L/M	M	L/M	L/M	H	H	H	H	
Toxic Organic Compounds	M/H	M/H	M/H	L	L/M	H	H	H	H	
Trash & Debris	L	L	H	H	H	H	H	L	H	
Bacteria & Viruses (also: Pathogens)	L	M	H	L	M	H	H	H	H	
Oil & Grease	M	M	H	M	H	H	H	H	H	
Heavy Metals	M	M/H	M/H	L/M	M	H	H	H	H	

Abbreviations:
L: Low removal efficiency M: Medium removal efficiency H: High removal efficiency

Notes:
(1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
(2) Expected performance when designed in accordance with the most current edition of the document, "Riverside County, Whitewater River Region Stormwater Quality Best Management Practice Design Handbook".
(3) Performance dependent upon design which includes implementation of thick vegetative cover. Local water conservation and/or landscaping requirements should be considered; approval is based on the discretion of the local land use authority.
(4) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP (including proprietary filters, hydrodynamic separators, inserts, etc.), or newly developed/emerging stormwater treatment technologies.
(5) Expected performance should be based on evaluation of unit processes provided by BMP and available testing data. Approval is based on the discretion of the local land use authority.
(6) When used for primary treatment as opposed to pre-treatment, requires site-specific approval by the local land use authority.

V.1.A Site Design BMP Concepts and LID/Site Design BMPs

This section documents the Site Design BMP concepts and LID/Site Design BMPs that will be implemented on this project to comply with the requirements detailed in Section 3.5.1 of the WQMP Guidance document.

- Table 3 herein documents the implementation of the Site Design BMP Concepts described in sub-sections 3.5.1.3 and 3.5.1.4.
- Table 4 herein documents the extent to which this project has implemented the LID/Site Design goals described in sub-section 3.5.1.1.

Table 3. Implementation of Site Design BMP Concepts

Design Concept	Technique	Specific BMP	Included: Yes	Included: No	Included: N/A	Brief Reason for BMPs Indicated as No or N/A
Site Design BMP Concept 1	**Minimize Urban Runoff, Minimize Impervious Footprint, and Conserve Natural Areas (See WQMP Section 3.5.1.3)**	Conserve natural areas by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition.	☐	☐	☐	
		Conserve natural areas by incorporating the goals of the Multi-Species Habitat Conservation Plan or other natural resource plans.	☐	☐	☐	
		Preserve natural drainage features and natural depressional storage areas on the site.	☐	☐	☐	
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	☐	☐	☐	
		Use natural drainage systems.	☐	☐	☐	
		Where applicable, incorporate Self-Treating Areas	☐	☐	☐	
		Where applicable, incorporate Self-Retaining Areas	☐	☐	☐	
		Increase the building floor to area ratio (i.e., number of stories above or below ground).	☐	☐	☐	
		Construct streets, sidewalks and parking lot aisles to minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.	☐	☐	☐	
		Reduce widths of streets where off-street parking is available.	☐	☐	☐	
		Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	☐	☐	☐	
		Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☐	

Table 3. Site Design BMP Concepts (continued)

Design Concept	Technique	Specific BMP	Included: Yes	Included: No	Included: N/A	Brief Reason for Each BMP Indicated as No or N/A
Site Design BMP Concept 2	**Minimize Directly Connected Impervious Area (See WQMP Section 3.5.1.4)**	Design residential and commercial sites to contain and infiltrate roof runoff, or direct roof runoff to landscaped swales or buffer areas.	☐	☐	☐	
		Drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	☐	☐	☐	
		Incorporate landscaped buffer areas between sidewalks and streets.	☐	☐	☐	
		Use natural or landscaped drainage swales in lieu of underground piping or imperviously lined swales.	☐	☐	☐	
		Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	☐	☐	☐	
		Maximize the permeable area by constructing walkways, trails, patios, overflow parking, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces such as pervious concrete, porous asphalt, unit pavers, and granular materials.	☐	☐	☐	
		Use one or more of the following:				
		Rural swale system: street sheet flows to landscaped swale or gravel shoulder, curbs used at street corners, and culverts used under driveways and street crossings.	☐	☐	☐	
		Urban curb/swale system: street slopes to curb; periodic swale inlets drain to landscaped swale or biofilter.	☐	☐	☐	
		Dual drainage system: first flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder; high flows connect directly to MS4s.	☐	☐	☐	
		Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☐	
		Use one or more of the following for design of driveways and private residential parking areas:				
		Design driveways with shared access, flared (single lane at street), or wheel strips (paving only under the tires).	☐	☐	☐	
		Uncovered temporary or guest parking on residential lots paved with a permeable surface, or designed to drain into landscaping.	☐	☐	☐	

Table 3. Site Design BMP Concepts (continued)

Design Concept	Technique	Specific BMP	Included: Yes	Included: No	Included: N/A	Brief Reason for Each BMP Indicated as No or N/A
Site Design BMP Concept 2 (cont'd)	**Minimize Directly Connected Impervious Area (See WQMP Section 3.5.1.4)**	Other comparable and equally effective Site Design BMP concept(s) as approved by the local land use authority (Note: Additional narrative required to describe BMP and how it addresses site design concept).	☐	☐	☐	
		Use one or more of the following for design of parking areas:				
		Where landscaping is proposed in parking areas, incorporate parking area landscaping into the drainage design.	☐	☐	☐	
		Overflow parking (parking stalls provided in excess of the Permittee's minimum parking requirements) may be constructed with permeable pavement.	☐	☐	☐	
		Other comparable and equally effective Site Design BMP (or BMPs) as approved by the local land use authority (Note: Additional narrative required describing BMP and how it addresses site design concept).	☐	☐	☐	

<u>Project Site Design BMP Concepts:</u>

Not applicable to the project. The total area treated requirement is met via onsite retention per ***Cathedral City Municipal Code – Title 8 § 8.24.070***

<u>Alternative Project Site Design BMP Concepts:</u>

Not applicable to the project. The total area treated requirement is met via onsite retention per ***Cathedral City Municipal Code – Title 8 § 8.24.070***

Table 4. LID/Site Design BMPs Meeting the LID/Site Design Measurable Goal

(1) DRAINAGE SUB-AREA ID OR NO.	(2) LID/SITE DESIGN BMP TYPE* (See Table 2)	(3) POTENTIAL POLLUTANTS OF CONCERN WITHIN DRAINAGE SUB-AREA (Refer to Table 1)	(4) POTENTIAL POLLUTANTS WITHIN SUB-AREA CAUSING RECEIVING WATER IMPAIRMENTS (Refer to Table 1)	(5) EFFECTIVENESS OF LID/SITE DESIGN BMP AT ADDRESSING IDENTIFIED POTENTIAL POLLUTANTS (U, L, M, H/M, H; see Table 2)	(6) BMP MEETS WHICH DESIGN CRITERIA? (Identify as V_{BMP} OR Q_{BMP})	(7) TOTAL AREA WITHIN DRAINAGE SUB-AREA (Nearest 0.1 acre)
TOTAL PROJECT AREA TREATED WITH LID/SITE DESIGN BMPs (NEAREST 0.1 ACRE)						

*** LID/Site Design BMPs listed in this table are those that <u>completely</u> address the 'Treatment Control BMP requirement' for their drainage sub-area.**

Justification of infeasibility for sub-areas not addressed with LID/Site Design BMPs

Insert text here listing each drainage sub-area wherein the design criteria of VBMP and/or QBMP are not treated using LID/Site Design BMPs as required in WQMP Guidance Section 3.5.1.1, and provide justification of infeasibility for each.

V.1.B TREATMENT CONTROL BMPS

Conventional Treatment Control BMPs shall be implemented to address the project's Pollutants of Concern as required in WQMP Section 3.5.1 where, and to the extent that, Section V.1.A has demonstrated that it is infeasible to meet these requirements through implementation of LID/Site Design BMPs.

☐ The LID/Site Design BMPs described in Section V.1.A of this project-specific WQMP completely address the 'Treatment Control BMP requirement' for the entire project site (and where applicable, entire existing site) as required in Section 3.5.1.1 of the WQMP Guidance document. Supporting documentation for the sizing of these LID/Site Design BMPs is included in Appendix F. ***Section V.1.B does not need to be completed**.

☐ The LID/Site Design BMPs described in Section V.1.A of this project-specific WQMP do **NOT** completely address the 'Treatment Control BMP requirement' for the entire project site (or where applicable, entire existing site) as required in Section 3.5.1.1 of the WQMP. ***Section V.1.B must be completed.**

The Treatment Control BMPs identified in this section are selected, sized and implemented to treat the design criteria of V_{BMP} and/or Q_{BMP} for all project (and if required, existing site) drainage sub-areas which were not fully addressed using LID/Site Design BMPs. Supporting documentation for the sizing of these Treatment Control BMPs is included in Appendix F.

Table 5: Treatment Control BMP Summary

(1) DRAINAGE SUB-AREA ID OR NO.	(2) TREATMENT CONTROL BMP TYPE* (See Table 2)	(3) POTENTIAL POLLUTANTS OF CONCERN WITHIN DRAINAGE SUB-AREA (Refer to Table 1)	(4) POTENTIAL POLLUTANTS WITHIN SUB-AREA CAUSING RECEIVING WATER IMPAIRMENTS (Refer to Table 1)	(5) EFFECTIVENESS OF TREATMENT CONTROL BMP AT ADDRESSING IDENTIFIED POTENTIAL POLLUTANTS (U, L, M, H/M, H; see Table 2)	(6) BMP MEETS WHICH DESIGN CRITERIA? (Identify as V_{BMP} OR Q_{BMP})	(7) TOTAL AREA WITHIN DRAINAGE SUB-AREA (Nearest 0.1 acre)
	TOTAL PROJECT AREA TREATED WITH TREATMENT CONTROL BMPs (NEAREST 0.1 ACRE)					

V.1.C Measurable Goal Summary

This section documents the extent to which this project has met the measurable goal described in WQMP Section 3.5.1.1 of addressing 100% of the project's 'Treatment Control BMP requirement' with LID/Site Design BMPs. Projects required to retain Urban Runoff onsite in conformance with local ordinance are considered to have met the measurable goal; for these instances, '100%' is entered into Column 3 of the Table.

Table 6: Measurable Goal Summary

(1) Total Area Treated with LID/Site Design BMPs (Last row of Table 4)	(2) Total Area Treated with Treatment Control BMPs (Last row of Table 5)	(3) % of Treatment Control BMP Requirement addressed with LID/Site Design BMPs
264.21 ac		100%

* Approximately 26.7 acres of the western portion of the property is located within the Morongo Creek Stormwater Channel. This portion of the site will not be developed; therefore, it is not included in the total area treated.

The total area treated requirement is met via onsite retention per ***Cathedral City Municipal Code – Title 8 § 8.24.070***

V.2 SOURCE CONTROL BMPS

This section identifies and describes the Source Control BMPs applicable and implemented on this project.

Table 7. Source Control BMPs

BMP Name	*Check One*		*If not applicable, state brief reason*
	Included	*Not Applicable*	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	☒	☐	
Activity Restrictions	☒	☐	
Irrigation System and Landscape Maintenance	☒	☐	
Common Area Litter Control	☒	☐	
Street Sweeping Private Streets and Parking Lots	☒	☐	
Drainage Facility Inspection and Maintenance	☒	☐	
Structural Source Control BMPs			
Storm Drain Inlet Stenciling and Signage	☒	☐	
Landscape and Irrigation System Design	☒	☐	
Protect Slopes and Channels	☒	☐	
Provide Community Car Wash Racks	☐	☒	Wash & rinse waters from car washing activities from any homeowner will drain to the onsite storm drain system and discharge into onsite retention basins for treatment.
Properly Design*:			
Fueling Areas	☐	☒	Not a part of the project
Air/Water Supply Area Drainage	☐	☒	Not a part of the project
Trash Storage Areas	☒	☐	
Loading Docks	☐	☒	Not a part of the project
Maintenance Bays	☐	☒	Not a part of the project
Vehicle and Equipment Wash Areas	☐	☒	Not a part of the project
Outdoor Material Storage Areas	☐	☒	Not a part of the project
Outdoor Work Areas or Processing Areas	☐	☒	Not a part of the project
Provide Wash Water Controls for Food Preparation Areas	☒	☐	

*Details demonstrating proper design must be included in Appendix F.

Education/ Training of Property Owners, Tenants, or Employees

The HOA shall provide environmental awareness education materials to all home owners, members of the HOA, employees and contracted personnel. These materials shall include general housekeeping practices that contribute to the protection of urban runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements.

Activity Restrictions

CC&Rs of the HOA identify activity restrictions for the purpose of Receiving Water quality protection. These restrictions include:

- Prohibiting vehicular parking in streets. Vehicular parking is restricted to residential driveways and common parking areas within Rio Vista Village.

Irrigation System and Landscape Maintenance

Maintenance of irrigation systems and landscaping shall be consistent with the local land use authority's water conservation ordinance, which can be accessed through the local land use authority's website at http://web.cvwd.org/about/conservation.php. Fertilizer and pesticide usage shall be consistent with the instructions contained on product labels and with regulations administered by California's Department of Pesticide Regulations.

Common Area Litter Control

The HOA will provide trash receptacles in common/ open space areas. The receptacles will be emptied weekly and placed in trash containers approved by the City for weekly disposal by City's trash disposal service.

Street Sweeping Private Streets and Parking Lots

Public streets within the development will be swept monthly according to the City's street sweeping schedule. The HOA shall provide sweeping of the developments private parking areas.

Drainage Facility Inspection and Maintenance

The HOA will provide inspections of onsite catch basins and storm drain inlets. Drainage facilities to be cleaned if any debris and sediments are present.

Storm Drain Inlet Stenciling and Signage

Stencils containing a brief statement that prohibits dumping into common area catch basins will be placed at all onsite catch basin locations.

Landscape and Irrigation System Design

Implementation of landscaping that is consistent with the local land use authority's water conservation ordinance, and landscaping that utilizes native or drought tolerant species

Protection of Slopes and Channels

Slopes will be planted with native or drought tolerant vegetation to prevent erosion of slope walls.

Properly Design and Maintain Trash Storage Areas

All trash container areas in common and open space areas maintained by the HOA will be designed to City standards and shall meet the following requirements:

- Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash.

- Trash dumpsters (containers) shall be leak proof and have attached covers or lids.
- Connection of trash area drains to the MS4 is prohibited.

Individual lots will have trash containers provided by the Cathedral City. Three 96 gallon automated carts will be provided to each homeowner for the collection of regular household trash, recyclables, and green waste. Additional information regarding refuge services can be obtained at: http://www.cathedralcity.gov/index.aspx?page=97

Provide Wash Water Controls for Food Preparation Areas

All food preparation areas within the Community Center building shall have contained areas or sinks, each with connections to the sanitary sewer for disposal of wash waters containing kitchen and food wastes. Food preparation is proposed within the facility only.

*Appendix D includes copies of the educational materials (described in Section 3.5.2.1 of the WQMP Guidance document) that will be used in implementing this project-specific WQMP.

V.3 Equivalent Treatment Control BMP Alternatives

Not applicable to the project.

V.4 Regionally-Based BMPs

Not applicable to the project.

VI. Operation and Maintenance Responsibility for BMPs

Appendix G of this project-specific WQMP includes copies of CC&Rs, Covenant and Agreements, BMP Maintenance Agreement and/or other mechanisms used to ensure the ongoing operation, maintenance, funding, transfer and implementation of the project-specific WQMP requirements.

The Homeowners Association is responsible for all common area BMP maintenance.

Contact:
Rio Vista Village Community Association
C/O: The Management Trust (The Monarch Division)
Attention: Liz Weber, CCAM
Association Manager
39755 Berkey Drive, Suite A • Palm Desert, CA 92211
Phone: (760) 776-5100 ext 6341
Fax: (760) 776-5111

Source Control BMP	Implementation and Maintenance Frequency	Inspection Frequency	Responsible Party
Education/ Training for Property Owners, Tenants, or Employees	The HOA shall provide environmental awareness education materials to all home owners and members of the HOA. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements and day to day uses. The HOA shall obtain these materials through the local land use authority at http://web.cvwd.org/about/stormwater.php . Employees or contracted personnel of the HOA performing activities that may impact Urban Runoff, BMP training and education programs must be provided to all new employees/ contracted members within 6 months of hire date/ contracted date and annually thereafter. Employee training materials may be derived from educational materials available through the local land use authority. The HOA will provide training to new employees or newly contracted members. The project features retention basins that may have potential to violate local vector control requirements, the HOA will obtain information from the local land use authority and provide information to the project's residents/occupants/tenants.	Annually	HOA

Activity Restrictions	CC&Rs of the HOA shall include activity restrictions for the purpose of receiving water quality protection. These restrictions include: -Prohibiting vehicular parking in streets. Parking will only be allowed in residential driveways and common parking areas.	Daily	HOA & Homeowner
Irrigation System & Landscape Maintenance	Homeowners shall be responsible for landscape maintenance associated with their lot which will include activities such as replacement of dead vegetation, the repair of erosion rills, proper disposal of green waste, etc. Per Article 7.3 of CC&Rs, if the homeowner fails to meet HOA requirements, the HOA will repair and replace vegetation at the Homeowners expense. For open space and common space areas, the HOA will ensure that weekly landscape maintenance procedures will incorporate the replacement of dead vegetation, the repair of erosion rills, proper disposal of green waste, trimming of overgrowth, etc. The HOA will perform monthly inspections for the irrigation system located within open space/ common space areas and will provide repairs, if observed, on system failures such as overspray and broken sprinkler heads.	Weekly/ Monthly	Homeowner & HOA
Common Area Litter Control	Trash receptacles will be located in common/ open space areas. The receptacles will be emptied weekly and placed in trash containers approved by the City for weekly disposal by Cathedral City's Trash and Recycling Department. Patrolling common areas and perimeter fences or walls to collect litter will occur weekly during landscape maintenance activities, noting trash disposal violations by tenants/home owners and reporting such observations to the HOA for investigation, and identification of the party responsible for the violation.	Weekly	HOA
Street Sweeping Private Streets and Parking Lots	Streets and alleys are owned by the City. The City will maintain street areas curb to curb. The HOA will maintain alley ways. Street sweeping on alley ways and common parking areas will be performed by the HOA. Trash and debris collected from maintenance activities shall be placed in receptacles to be disposed of by the City's Trash and Recycling Department	Monthly	HOA

Drainage Facility Inspection and Maintenance	Onsite catch basins and storm drain inlets will be inspected prior to the start of the rainy season (October 1st) shall be performed. The inlets and catch basins will be cleaned when accumulated sediment/debris fills 25% or more of the sediment/debris storage capacity. Onsite retention basins shall be cleaned of debris during weekly landscape maintenance activities. Trash and debris shall be placed in trash receptacles. Drywells are to be inspected prior to the start of the rainy season. Sediments, trash and debris shall be placed in trash receptacles. 72 hours after any storm event, retention basins and dry wells shall be inspected to ensure proper infiltration is occurring. Excess sediments and debris shall be removed. Repair as needed.	Yearly/ 72 hrs after any storm event	HOA
Storm Drain Inlet Stenciling & Signage	Where onsite catch basins are located, stenciling or labeling containing a brief statement prohibiting dumping into the onsite storm drain system or graphical icons discouraging illegal dumping shall be provided. Stenciling/ signage repairs will be performed as needed.	Yearly	HOA
Landscape and Irrigation System Design	Implementation of landscaping that is consistent with the local land use authority's water conservation ordinance, and landscaping that utilizes native or drought tolerant species.	New Ownership or Development	HOA & Homeowner
Protection of Slopes and Channel	Slopes in retention areas and slopes located on individual lots will be planted with native or drought tolerant vegetation to prevent erosion of slope walls. Slopes shall be maintained with the use of efficient irrigation and typical landscaping activities. If erosion rills occur, repair as needed.	Yearly	HOA & Homeowner

Properly Design and Maintain Trash Storage Areas	All trash container areas in common and open space areas maintained by the HOA will be designed to City's standards and shall meet the following requirements: ▪ Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements areas, screened or walled to prevent off-site transport of trash. ▪ Trash dumpsters (containers) shall be leak proof and have attached covers or lids. ▪ Connection of trash area drains to the MS4 is prohibited. Individual lots will have trash containers provided by the Cathedral City. Three 96 gallon automated carts with workable lids will be provided by the City to each homeowner for the collection of regular household trash, recyclables, and green waste.	Weekly	HOA & Homeowner

Appendix D includes copies of the educational materials (described in Section 3.5.2.1 of the WQMP Guidance document) that will be used in implementing this project-specific WQMP.

The Homeowners association shall maintain inspection logs of routine maintenance inspections and shall note repairs performed.

VII. Funding

The Rio Vista Village Community Association will be responsible for the funding of Operation and Maintenance of all open space and common areas, retention basins, and common parking areas. Public streets and alley ways are owned by the City of Cathedral City. Cathedral City will be responsible for the maintenance of streets (curb to curb). The HOA will be responsible for the maintenance of alley ways and areas located between the right-of-way and curb of public streets.

Contact:
Rio Vista Village Community Association
C/O: The Management Trust (The Monarch Division)
Attention: Liz Weber, CCAM
Association Manager
39755 Berkey Drive, Suite A • Palm Desert, CA 92211
Phone: (760) 776-5100 ext 6341
Fax: (760) 776-5111

Homeowners will be responsible for Operation and Maintenance of individual lots.

Appendix B

Vicinity Map, WQMP Site Plan, Receiving Waters Map, and Reference Maps

WATER QUALITY MANAGEMENT PLAN

SHEET 1 OF 1

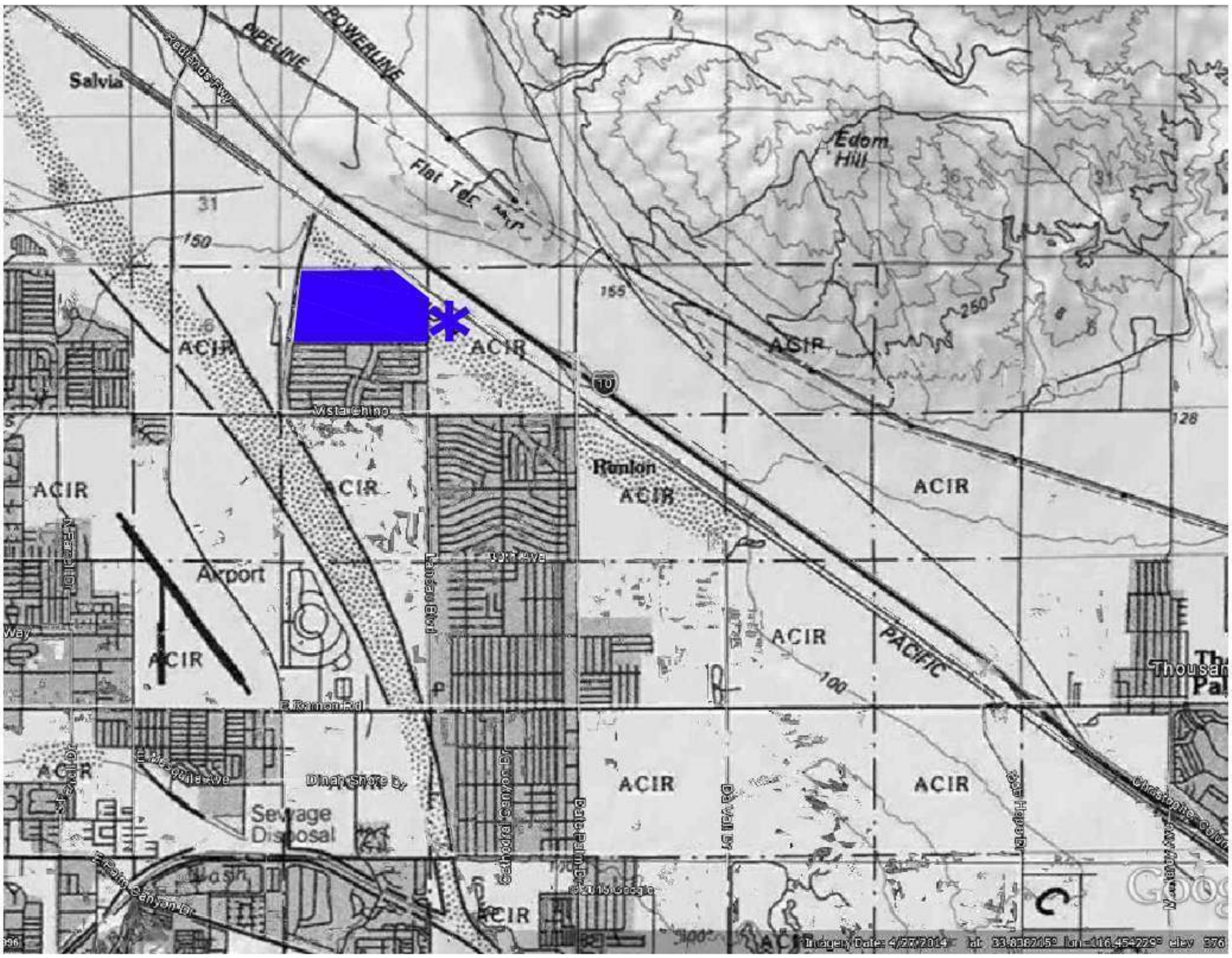
EXHIBIT A-VICINITY MAP

FOR

RIO VISTA VILLAGE

NW CORNER OF LANDAU BLVD AND VERONA RD

CATHEDRAL CITY, COUNTY OF RIVERSIDE



LEGEND:

PROJECT AREA

DISCHARGE POINT

N

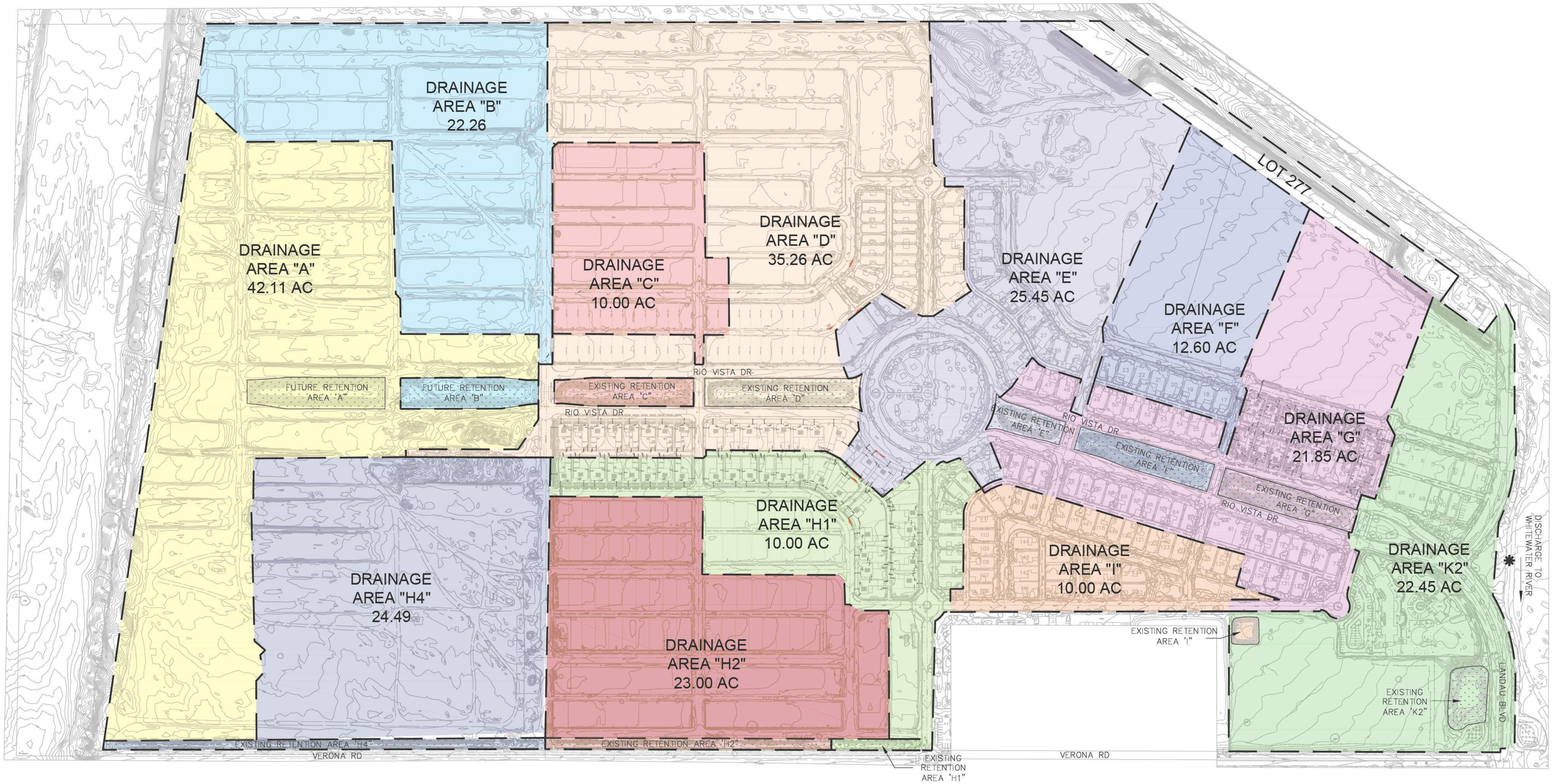
N.T.S.

CASC Engineering and Consulting
1470 EAST COOLEY DRIVE, COLTON, CA 92324
PH. (909) 783-0101 FAX (909) 783-0108
www.cei-casc.com

RETENTION AREA DATA

	100-YR, 24-HR VOLUME OF RETENTION AREA (AC-FT)	MINIMUM DESIGN SURFACE AREA OF BASIN (CF)	PROVIDED SURFACE AREA OF BASIN (CF)
A	*	*	*
B	0.67	21018	27470
C	0.30	11471	14980
D	1.06	21635	26720
E	0.76	11854	12469
F	0.38	15311	19813
G	0.66	9272	25294
H1	0.30	5462	6453
H2	0.69	6011	25650
H4	0.73	6401	27000
I	0.30	6953	7545
K2	0.67	12912	19699

*TO BE DETERMINED DURING BUILD OUT



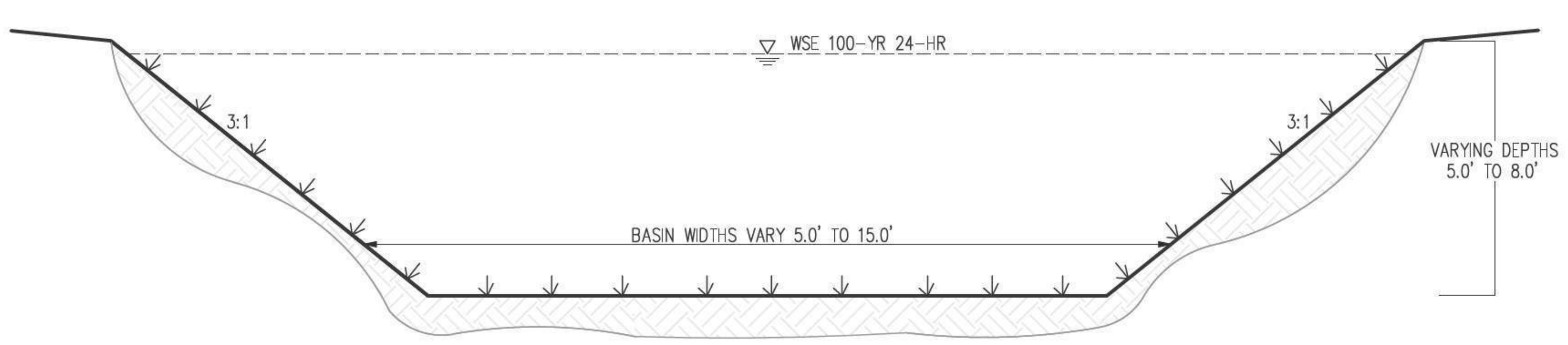
LEGEND

- RETENTION AREA
- EXISTING STRUCTURES
- DRAINAGE AREA BOUNDARY
- ✱ DISCHARGE POINT

GRAPHIC SCALE

200 0 100 200 400

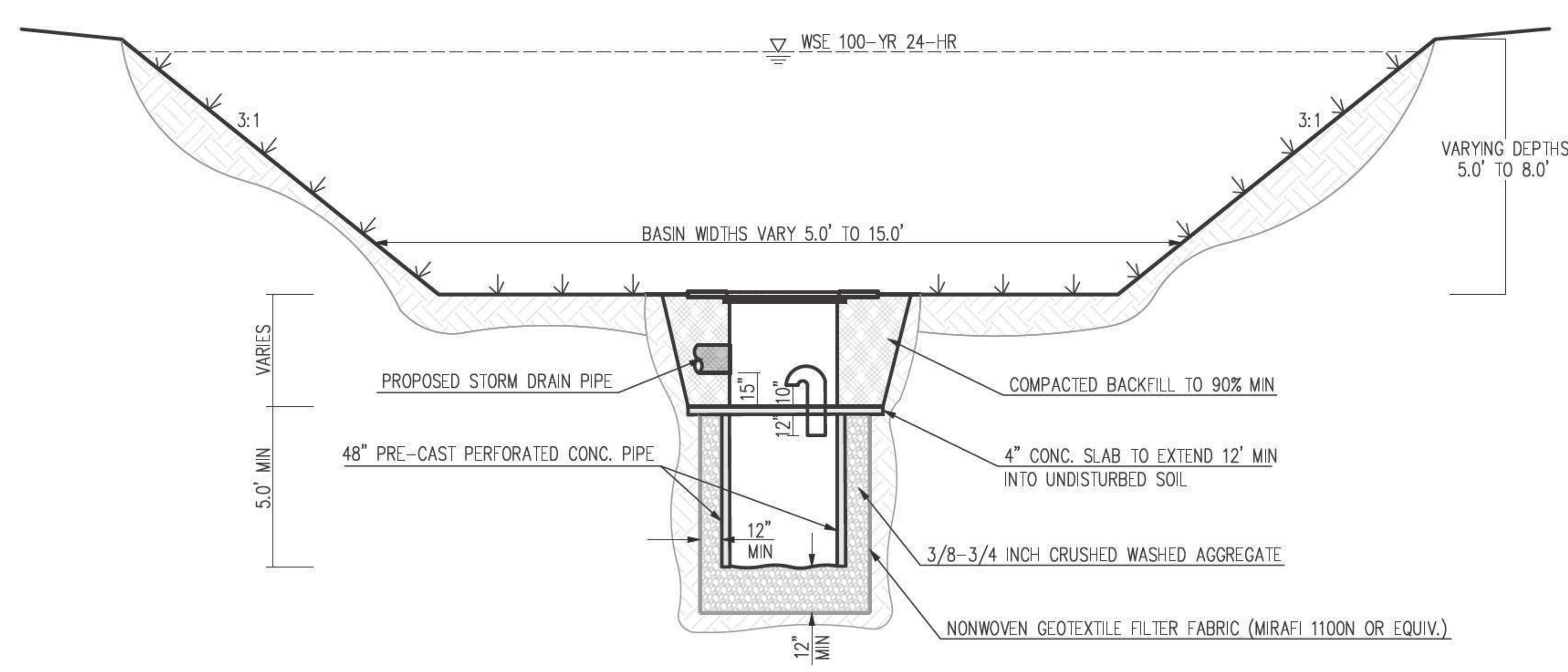
1" = 200'



TYPICAL DETAIL

EXISTING RETENTION BASINS H1, H2, H4, AND K2

N.T.S.



TYPICAL DETAIL

EXISTING RETENTION AREAS C, D, E, F, G, AND I WITH DRY WELLS

N.T.S.

MASTER WATER QUALITY MANAGEMENT PLAN (M-WQMP) SITE EXHIBIT

FOR

RIO VISTA VILLAGE

CASC Engineering and Consulting
1470 EAST COOLEY DRIVE, COLTON, CA 92324
PH. (909) 783-0101 FAX (909) 783-0108
www.oei-casc.com

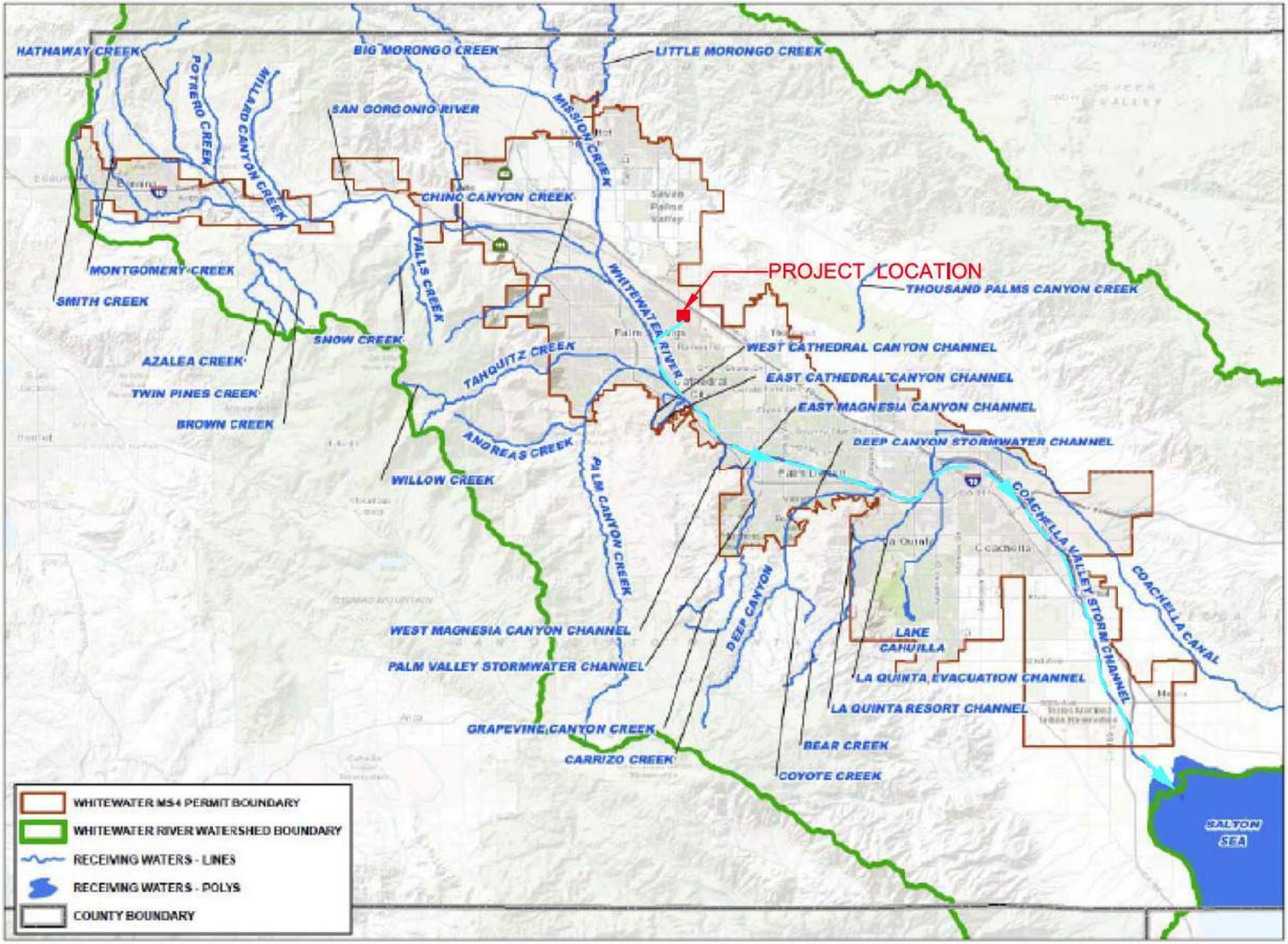
APPLICANT:
INLAND COMMUNITY CORP.
6430 W. SUNSET BLVD., SUITE 460
LOS ANGELES, CA 90028
PH: (323) 874-8000

SHEET 1 OF 1

Drawing Name: Z:\1372-0001 Inland Communities – Rio Vista\WQMP DWGS\RIO VISTA MASTER V2.dwg
Last Opened: Jul 08, 2015 – 1:43pm by jgoode

RIO VISTA VILLAGE

Figure 2. Whitewater River Region Receiving Waters Map



CITY 300/54

DRAWING NUMBER 300/54 2914

DRAWING NUMBER 28639-1

IN THE CITY OF CATHEDRAL CITY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

TRACT MAP NO. 28639-1

BEING A SUBDIVISION OF A PORTION OF THE NORTH HALF OF FRACTIONAL SECTION 5, TOWNSHIP 4 SOUTH, RANGE 5 EAST, S.B.M.
MAINIERO, SMITH AND ASSOCIATES, INC. MARCH 2000

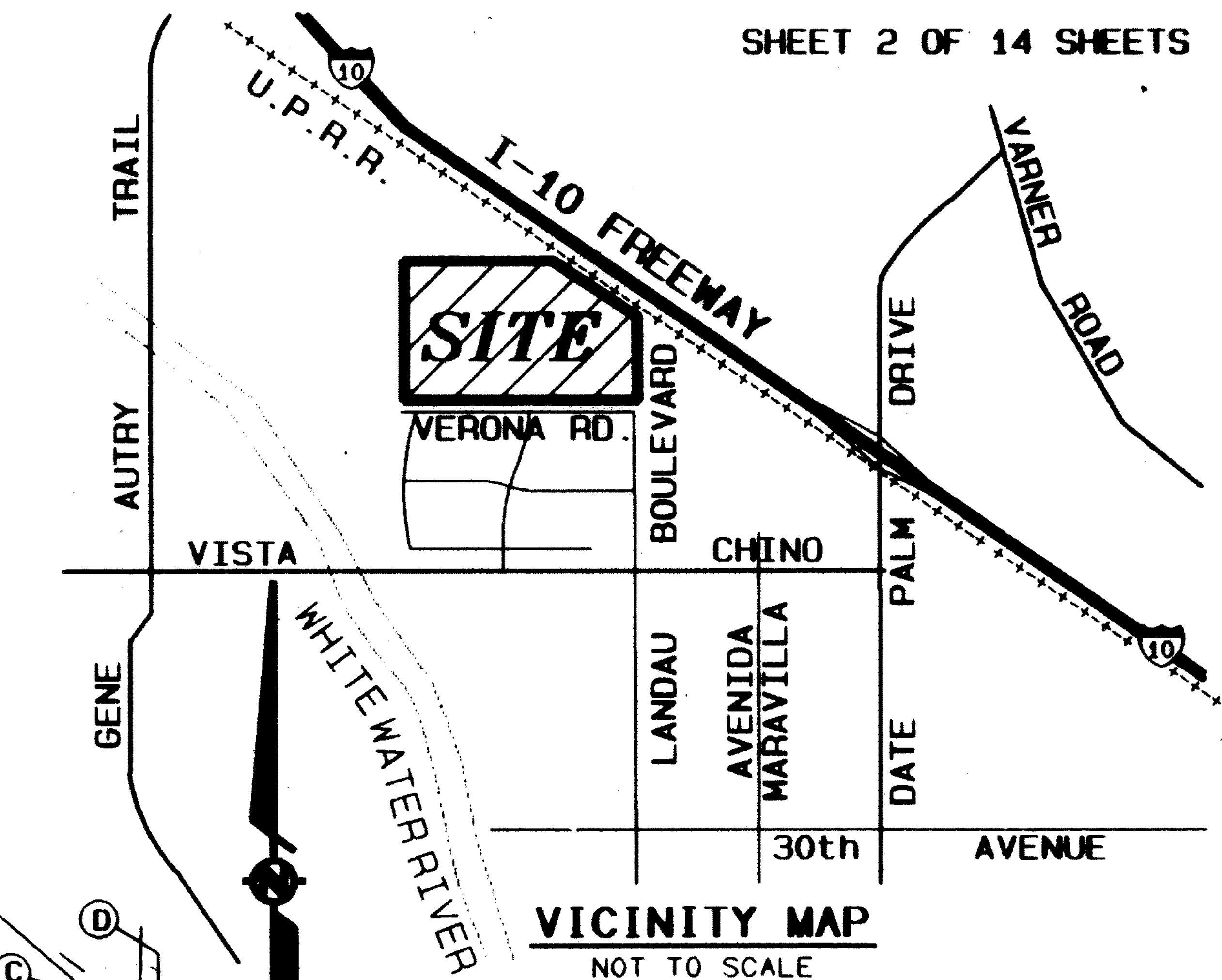
MONUMENT LEGEND

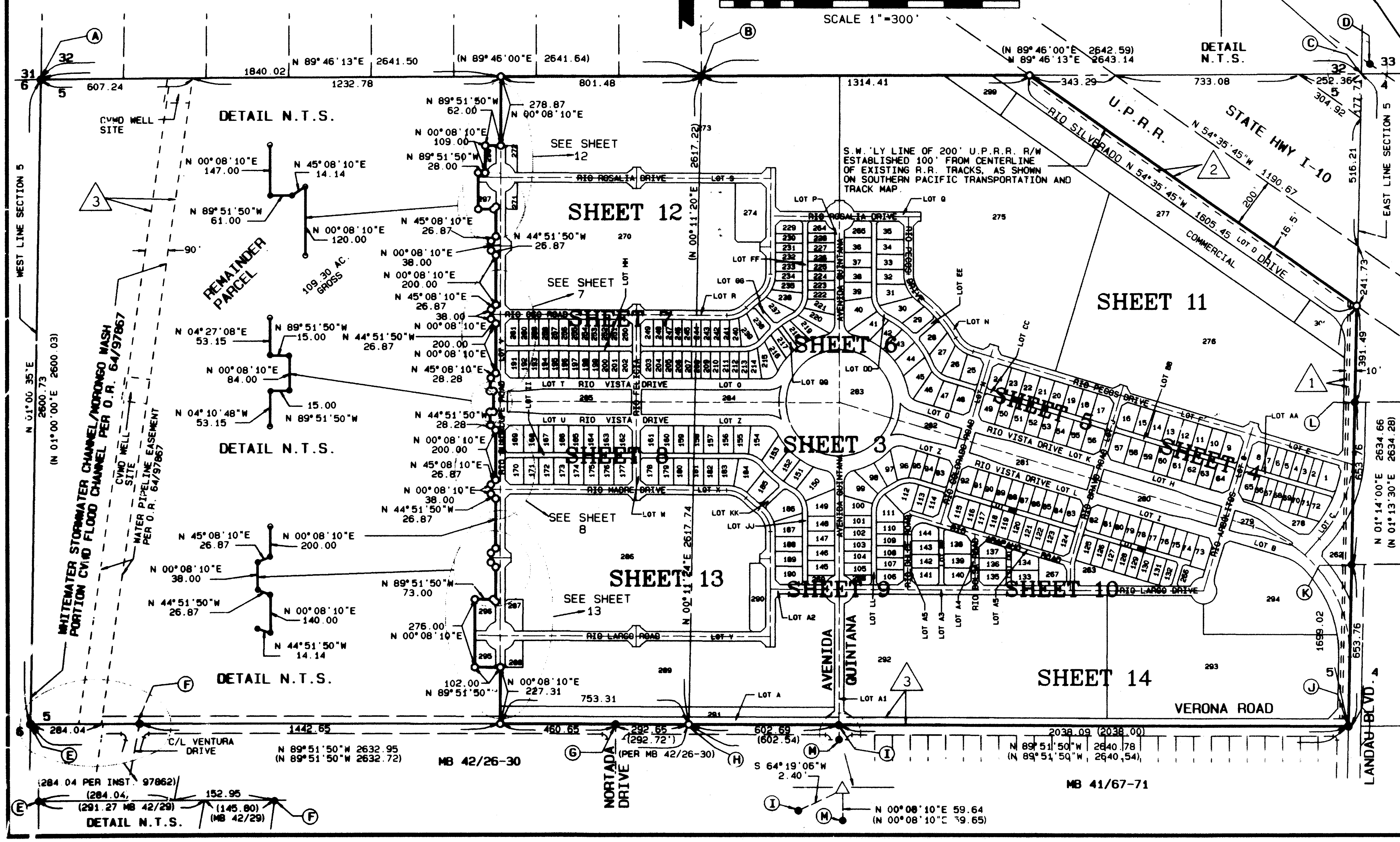
- (A) FD 3-1/2" USGLO BRASS DISC UP 1.0' ACCEPT AS NW COR. SEC. 5 PER MB 41/67-71, STAMPED 31 32 / 6 5.
- (B) FD USGLO BRASS DISC UP 0.5' ACCEPT AS N 1/4 SEC. 5 PER MB 41/67-71, STAMPED 32 / 5.
- (C) SEARCHED, FD NOTHING. POINT FALLS IN DRIVING LANE OF I-10 FREEWAY. POSITION RE-ESTABLISHED BY INTERSECTION OF LINE THROUGH FOUND MONUMENTS OF EAST LINE AND PROLONGATION OF NORTH LINE. POSITION FITS TIE OF 53.27' SHOWN AS STA. 603+24.51 POT ON I-10 RW MAP 204-592
- (D) FD 2x2 HUB OVER BRASS DISC STAMPED "603+24.51 POT" PER I-10 R/W MAP 204-592
- (E) FD 3/4" I.P. DOWN 1.0' NO TAG, IN LIEU OF 1-1/4" I.P. FOR W 1/4 COR SEC. 5 PER MB 41/67-71. AFFIX TAG RCE 26401.
- (F) FD COPPERWELD FLUSH RCE 22015 COR. REC. 97-215 AND 96-365 ACCEPT AS INTERSECTION VERONA ROAD AND VENTURA DRIVE, AS SHOWN ON MB 42/26-30.
- (G) FD COPPERWELD FLUSH RCE 22015, NO REFERENCE. ACCEPT AS INTERSECTION NORTADA DRIVE AND VERONA ROAD.
- (H) SEARCHED FOR C 1/4. DESTROYED BY CONSTRUCTION. RE-ESTABLISHED BY PRORATION BETWEEN 1/4 CORNERS.
- (I) FD COPPERWELD FLUSH RCE 22015 PER COR. REC. 97-177 S 64°19'06"W 2.40' FROM POSITION. ESTABLISHED POSITION FROM COPPERWELD AT B.C. TO SOUTH, PER COR. REC. 97-178. SET COPPERWELD FLUSH STAMPED RCE 26401
- (J) FD COPPERWELD FLUSH RCE 22015 PER COR. REC. 97-156 AND 96-390 ACCEPT AS E 1/4 COR. SEC. 5, AS SHOWN ON MB 42/26-30.
- (K) FD 1/2" I.P. NO TAG ACCEPT AS POINT ON LINE ONLY.
- (L) FD 1-1/2" I.P. RCE 9121. ACCEPT AS POINT ON LINE ONLY.
- (M) FD COPPERWELD FLUSH RCE 22015, PER COR. REC. 97-178 AND 96-373. ACCEPT AS C/L B.C. OF AVENIDA QUINTANA.

300 NUMBERED LOTS
RESIDENTIAL LOTS- LOTS 1 - 261
PARK/OPENSPACE- LOTS 262-269, 271-272, 274, 278, 287, 288, 290, 295-298
FUTURE MULTI-FAMILY- LOTS 275 AND 276
FUTURE RESIDENTIAL- LOTS 270, 273, 286, 289
STORM DRAIN, RETENTION/OPEN SPACE- LOTS 279-282, 284, 285, 291
RECREATION- LOTS 283 AND 294
SCHOOL- LOT 292
COMMERCIAL- LOTS 277 AND 293
CVWD WELL SITES- LOTS 299, 300

A-Z, A1-A5- STREETS
AA-PP ALLEYS
QQ- STORM DRAIN LOT

0' 300' 600' 900' 1200'
SCALE 1"=300'





ENGINEER'S NOTES

THE BASIS OF BEARINGS FOR THIS MAP IS THE CENTERLINE OF VERONA ROAD BETWEEN VENTURA DRIVE AND LANDAU BLVD. AS SHOWN ON TR. 2122 ON FILE IN BOOK 42, PAGES 26-30 OF MAPS, TAKEN AS N 89°51'50"W

- ● INDICATES FOUND MONUMENT AS NOTED
- ○ INDICATES SET 1" I.P. FLUSH, TAGGED RCE 26401
- △ INDICATES SET 1-1/4" BRASS DISC STAMPED RCE 26401, FLUSH, IN A.C. PAVEMENT (RIV. CO. STD. TYPE "B") MONUMENT), UNLESS NOTED OTHERWISE
- (-) INDICATES RECORD DATA PER MB 41/67-71 UNLESS NOTED OTHERWISE

PUE INDICATES PUBLIC UTILITY EASEMENT

CVWD INDICATES COACHELLA VALLEY COUNTY WATER DISTRICT

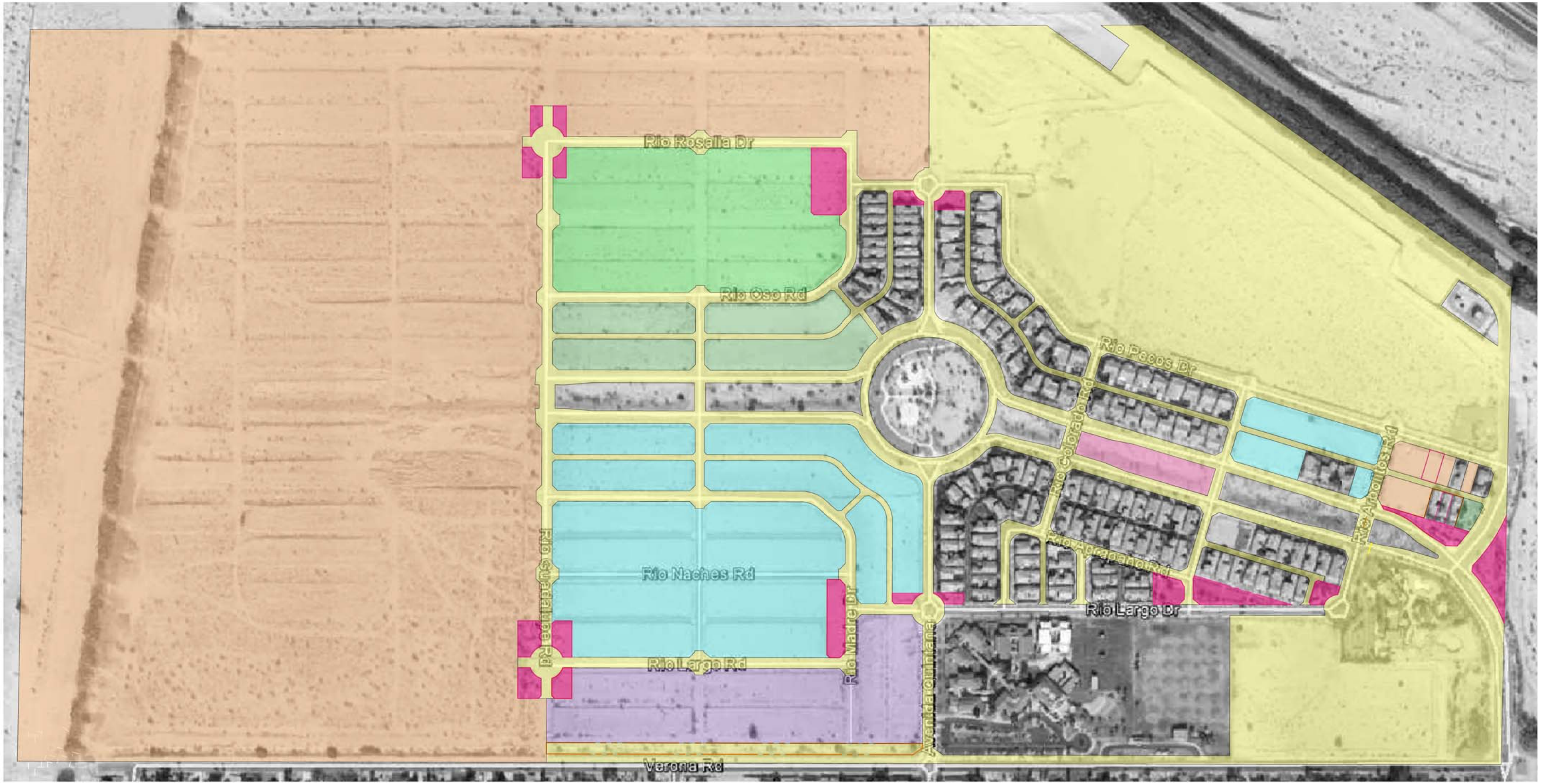
SET NAIL AND TAG IN CURB AT THE PROLONGATION OF ALL FRONT LOT CORNERS, STAMPED RCE 26401. SET NAIL AND TAG IN CURB AT ALL B.C.'S AND E.C.'S EITHER PERPENDICULAR OR RADIAL TO CENTERLINE, AS APPROPRIATE, STAMPED RCE 26401.

AT ALL REAR LOT CORNERS, SET 1" I.P. FLUSH IN NATURAL GROUND, TAGGED RCE 26401, SET NAIL AND TAG IN CONC. FOOTING STAMPED RCE 26401 OR NAIL AND TAG IN FENCING MATERIAL, TAGGED RCE 26401, AS APPROPRIATE.

TOTAL GROSS AREA = 193.61 ACRES

EASEMENT NOTES

1. 10' WIDE PUBLIC UTILITY EASEMENT IN FAVOR OF SOUTHERN CALIF. EDISON SUCCESSOR IN INTEREST TO CALIFORNIA ELECTRIC POWER COMPANY, PER INST. NO. 34376, REC. 5-10-57, O.R.
2. 16.5' TELEPHONE LINE EASEMENT IN FAVOR OF OF GENERAL TELEPHONE COMPANY, SCUCESSOR TO PACIFIC TELEPHONE AND TELEGRAPH PER DEED REC. 1/23/12 IN BK. 344, PG. 227, O.R.
3. 30' WIDE PUBLIC ROAD AND UTILITY EASEMENT, IN FAVOR OF THE CITY OF CATHEDRAL CITY, PER INST. NO. 117040, REC. 4-2-96, O.R.
4. 20' WIDE BLOWSAND CONTROL EASEMENT IN FAVOR OF THE CITY OF CATHEDRAL CITY. PER INST. NO. 117039, REC. 4-2-96, O.R. SEE SHEET 14 FOR ABANDONMENT CERTIFICATE.
5. PIPELINE EASEMENT IN FAVOR OF SOUTHERN PACIFIC RAILROAD COMPANY PER INST. REC. 1-29-37 IN BK. 309, PG. 572, O.R. (BLANKET IN NATURE)



(yellow)	VERONA RECOVERY, LLC	(orange)	CITY OF CATHEDRAL (BEING ACQUIRED BY VERANO RECOVERY, LLC)
(cyan)	PORTALES RECOVERY, LLC	(green)	CASSIA AT RIO VISTA RECOVERY, LLC
(purple)	SOL RECOVERY, LLC	(magenta)	CITY OF CATHEDRAL CITY, TO BE MAINTAINED BY RIO VISTA COMMUNITY ASSOCIATION
(pink)	RIO VISTA COMMUNITY ASSOCIATION		

N

NO SCALE

PROPERTY OWNERSHIP REFERENCE EXHIBIT

FOR

RIO VISTA VILLAGE MASTER WOMP

CASC
Engineering and Consulting

APPLICANT:

INLAND COMMUNITY CORP.
6430 W. SUNSET BLVD., SUITE 460
LOS ANGELES, CA 90028
PH: (323) 874-8000

Project Description

Project Owner: Portales Recovery, LLC
Attn: Mohamad Younes, P.E.
c/o Inland Communities Corp.
6430 W. Sunset Boulevard, Suite 460
Los Angeles, CA 90028
(323) 874-8000

WQMP Preparer: CASC Engineering and Consulting, Inc.
77-567 Country Club Drive, Suite 211
Palm Desert, CA 92211
Office: (760) 259-0108

Project Site Address: **NW Corner of Landau Blvd & Verona Rd**
Cathedral City, CA

Planning Area/
Community Name/
Development Name: **Los Portales 13 – Rio Vista Village (Final WQMP)**

APN Number(s): **Los Portales 13 (Lots 9-16, 57-60, & 64 of Tract 28639-1**)
APNs 677-553-001 to 677-553-012 & 677-553-016

Latitude & Longitude: **33.8556, -116.4824**

Receiving Water: **Whitewater River to Coachella Valley Storm Water Channel**

Project Site Size: **3.79 ac**

Standard Industrial Classification (SIC) Code: **1521, Single Family Homes**

Formation of Home Owners' Association (HOA)
or Property Owners Association (POA): Y ☒ N ☐

*See Rio Vista Master WQMP Section, Appendix G – CC&Rs

Los Portales 13 Final WQMP

Los Portales 13 lies within the project area of the Master WQMP (M-WQMP) for Rio Vista Village. The project will comply with the requirements established in the M-WQMP. Conditions of Approval for this phase of the development are located in the Rio Vista Village Master WQMP Section, Appendix A. Los Portales 13 proposes to develop Lots 9-16, 57-60, and 64 of Tract Map 28639-1. The proposed area for Los Portales 13 is approximately 3.79 acres. The project will construct 13 single family residences along Rio Vista Drive between Rio Bravo Road and Rio Arbolitos Road. Proposed construction will consist of residential buildings, utility laterals, landscaping, and minor grading. Roads, alleyways, curb and gutter, utilities, storm drain systems, and Retention Basin G were previously constructed during the initial phases of the project.

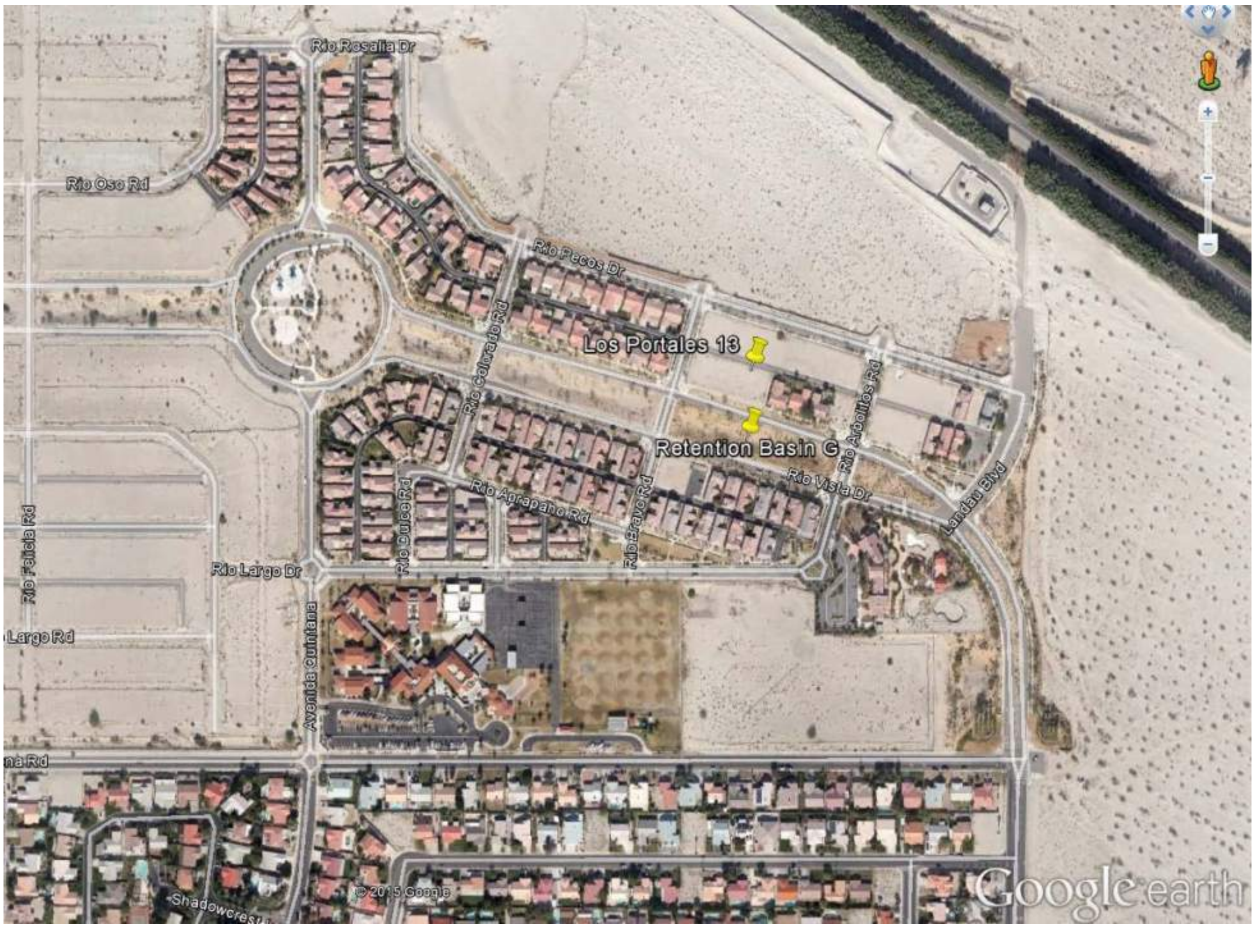


Figure 1. Project location of Los Portales 13 and Retention Basin G.

Los Portales 13 is located within Drainage Area G of the hydrology study. See Rio Vista Master WQMP Section, Appendix F – Drainage Report (dated May 4, 2001). The drainage area is approximately 12.60 acres. Each proposed lot will implement landscaping and roof runoff controls as on-lot site design features. Roof runoff will drain to landscaped areas and then conveyed to landscaped swales. Flows are directed to the existing curb and gutter system of the development and enter catch basins. Discharge is directed through the storm drain system to Retention Basin G.

Figure 2. Westerly view at the intersection of Rio Vista Boulevard and Rio Arbolitos Road. Catch basins associated with the drainage of Los Portales 13 are located at the northwest corner of Retention Basin G and at the northwest corner of the intersection.

To address potential water quality impacts associated with the development of the 13 residential lots, the project will utilize existing Retention Basin G in this drainage area for treatment control. The basin is designed with 3:1 slopes with capacity to detain for the 100-year, 24-hour storm event. Overflows from the 100-year, 24-hour storm event will discharge from catch basins located at the northeast corner and southeast corner of the basin. Overflows will be conveyed along the curb and gutter of Rio Vista Boulevard to Landau Boulevard. The total design capacity of the retention basin is 1.87 ac-ft. Infiltration testing sited a rate of 8.94 in/hr (Appendix F, Basic Infiltration Testing Report). Calculations were prepared using the infiltration rate and volumes based on the 100-yr, 24-hr storm event per the hydrology study. See M-WQMP, Appendix F, Infiltration Basin G Worksheet. The calculations demonstrate that the design of the basins provide adequate surface area to infiltrate for this event within 36 hours. The design of the existing basins exceed current NPDES WQMP requirements. Cathedral City Municipal Code – Title 8 § 8.24.070 requires the retention/detention of the 100-year, 3-hour storm events. The design capture volume of the retention areas surpasses this volume. Therefore, the project is not subject to the HCOC provisions of the WQMP and the project satisfies 100% of the LID/ site design measurable goal.

Figure 3. Overflow locations of Retention Basin G.

Attachments for Los Portales 13 Final WQMP section will include:

A. A Site Plan for the project. The Site Plan included as part of Appendix B depicts the following project features:

- Location and identification of all structural BMPs, including Source Control, LID/Site Design and Treatment Control BMPs.
- Landscaped areas.
- Paved areas and intended uses (i.e., parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.).
- Number and type of structures and intended uses (i.e., buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.).
- Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation.
- Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.
- Location(s) of Receiving Waters to which the project directly or indirectly discharges.
- Location of points where onsite (or tributary offsite) flows exit the property/project site.

DRAINAGE REPORT

TRACT 28639-1

RIO VISTA VILLAGE
City of Cathedral City, California

Prepared for

BURNETT COMPANIES

REGISTERED PROFESSIONAL ENGINEER
JULIAN A. DE LA TORRE
Julian A. De La Torre
NO. 43880
exp. 6-30-01
CIVIL
STATE OF CALIFORNIA

Revised May 4, 2001

Prepared by

MAINIERO, SMITH AND ASSOCIATES, INC.
PLANNING / CIVIL ENGINEERING / LAND SURVEYING
777 East Tahquitz Canyon Way, Suite 301, Palm Springs, CA 92262
Telephone (760) 320-9811 / FAX (760) 323-7893 / www.mainierosmith.com

Project Description

The Rio Vista Village (development) watershed is generally bounded by the Southern Pacific Railroad right-of-way on the north, Verona Road to the south, Landau Boulevard on the east, and the Morongo Creek Stormwater Channel on the west (see Figure 1). Tract 28639-1 (project) occupies the eastern two-thirds of the Rio Vista Village development (see Figure 2).

Existing Hydrology and Flood Control Improvements

The Rio Vista Village watershed consists of undeveloped, flat desert terrain sloping in a southeasterly direction (see Figure 1).

An unlined earthen channel/levee system known as the Morongo Creek Stormwater Channel runs along the west side of the development. It is assumed that the existing facility will intercept and convey the tributary offsite storm flows.

Rio Vista Village Master Plan of Drainage

The Rio Vista Village Master Plan of Drainage and the Rio Vista Village Master Plan of Drainage Alternative were prepared by AEI-CASC Engineering in May of 2000. The two Master Plans and the Mass Grading Plan for the development were approved on August 24, 2000. The Master Drainage Plan Alternative was prepared to identify the advantages of conveying storm flows within the street right-of-way and public utility easement (P.U.C.). These Master Plans were used as a planning tool to collect and convey the 100-year storm flows associated with the final improvements of Tract 28639-1.

Hydrology and Hydraulic Methods

The City of Cathedral City has local flood control jurisdiction and has required that Rio Vista Village retain 100% of the 100-year, 24-hour storm that falls within the site. In addition, the 10-year storm flows shall not exceed the top of curb and the 100-year storm flows shall not exceed the public utility easement (located 10-feet outside the proposed curb).

The Rational Method Hydrology computer program, Version 1.5A was used to determine the peak flows during the10-year and 100-year, 1-hour storm events. Soil Type "A" was used throughout the analysis. Development types were interpreted from the "Land Used Plan" provided in the Specific Plan for this development (see Figure 3). 60-foot, 58-foot and some 48-foot wide lots with park areas were grouped into the 50-percent impervious category, while 38-foot and most 48-foot wide lots where grouped into the 65-percent impervious category. Park areas were considered to be 40-percent impervious and retention basin 15-percent impervious. The Rational Method program uses a County of Riverside standard curb when determining the depth of flow in the streets. The majority of the project streets have a wedge curb. The wedge curb, in combination with the typical street cross section, has the capacity to convey more flow at top of curb than the standard curb street. Figures 4 & 5 indicate the formula to determine the curb capacity based on the street width and slope. Using street slope from the Street Improvement Plans the true street capacity is indicated next to the appropriate Rational Method section. For Rational Method sections where no depth of flow is given, separate Rational Method calculations were performed, using flow, slope and street width. These calculations are not included in this report but can be provided for reference, if needed. The 10-year storm does not exceed the top of curb. The 100-year storm does not exceed the public utility easement (see Figures 6-10 for typical street sections and wedge curb detail). There are small drain boxes and small drain lines around Rio Vista Drive. These facilities are intended to pick-up nuisance flows while storm flows are assumed to flow-by. These facilities are not incorporated in the Rational Method or Storm Drain Analysis (see the Proposed Hydrology Map).

The Unit-Hydrograph Analysis computer program based on the 1978 RCFC&WCD Hydrology Manual was used to determine the runoff volume tributary to the proposed retention basins during the 100-year, 24-hour storm event. Figures 11-21 indicate the eleven drainage areas covered in this report. See Figure 22 for the Unit Hydrograph Summary Chart that identifies the characteristics of each drainage area. 100-percent of the 100-year, 24-hour storm runoff is captured and retained by the proposed retention basins. Figures 23-44 represent the retention capacity and shape of each retention basin. The 100-year, 1-hour runoff volume (hgl) and the 100-year, 24-hour runoff volume are also indicated on these figures.

The Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade Line in Retention Basins was used to determine the hydraulic grade line at the outlet of each storm drain system. This hydrologic method was proposed to the City of Cathedral City in an effort to establish a beginning hydraulic grade line for the storm drain systems of Rio Vista Village during the peak runoff of the 100-year, 1-hour storm. This method was approved by Dave Feassel (City Engineer) on March 7, 2001. A Simplified Method is provided for each drainage area (see Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade Line in Retention Basins).

The Eagle Point Storm Sewer Analysis program was used to determine the hydraulic grade line of the proposed storm drain system. The storm sewer line information is taken from the Storm Drain Improvement Plans for Tract 28639-1. The storm drain flow information is taken from the Rational Method results. The Storm Sewer Analysis program represents the storm drain system as a series of connected lines and manholes. Lines represent the storm drains, and manholes represent catch basins, manholes, junction structures and deflection angles (see Storm Drain System Hydraulics).

The Catch Basin Capacity Charts were used to determine the required catch basin openings in the 100-year storm. The 100-year peak runoff and depth of flow was taken from the Rational Method results. The catch basins are sized to capture the 100-percent of the 100-year flows (see Catch Basin Calculations).

Proposed Flood Control Improvements

Proposed flood control improvement for the eleven drainage areas, as shown on Figures 11-21, consists of the following:

Drainage Area "B" – Retention Area "B" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm Drain Line B-1 (33", 27" & 24"), B-2 (18") and B-3 (18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans (copy attached).

Drainage Area "C" – Retention Area "C" is constructed in accordance with the Construction Phase 4 Precise Grading Plans for Rio Vista Village. Storm Drain Line C-1 (24" & 18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "D" – Retention Area "D" is constructed in accordance with the Construction Phase 3 Precise Grading Plans for Rio Vista Village. Storm Drain Line D-1 (42", 33" & 27"), D-2 (27" & 21") and D-3 (24") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "E" – Retention Area "E" is constructed in accordance with the Construction Phase 3 Precise Grading Plans for Rio Vista Village. Storm Drain Line E-1 (30" & 24") and E-2 (18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "F" – Retention Area "F" is constructed in accordance with the Construction Phase 2 Precise Grading Plans for Rio Vista Village. Storm Drain Line F-1 (24" & 21") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "G" – Retention Area "G" is constructed in accordance with the Construction Phase 1B Precise Grading Plans for Rio Vista Village. Storm Drain Line G-1 (30", 24" & 18") and G-2 (18") are constructed per the Storm Drain

Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "H1" – Retention Area "H1" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm Drain Line H1-1 (24" & 18") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Drainage Area "H2" – Retention Area "H2" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm drain facilities are not required at this time.

Drainage Area "H4" – Retention Area "H4" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm drain facilities are not required at this time.

Drainage Area "I" – Retention Area "I" is constructed in accordance with the Mass Grading Plan for Rio Vista Village. Storm Drain Line I-1 (24") is constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

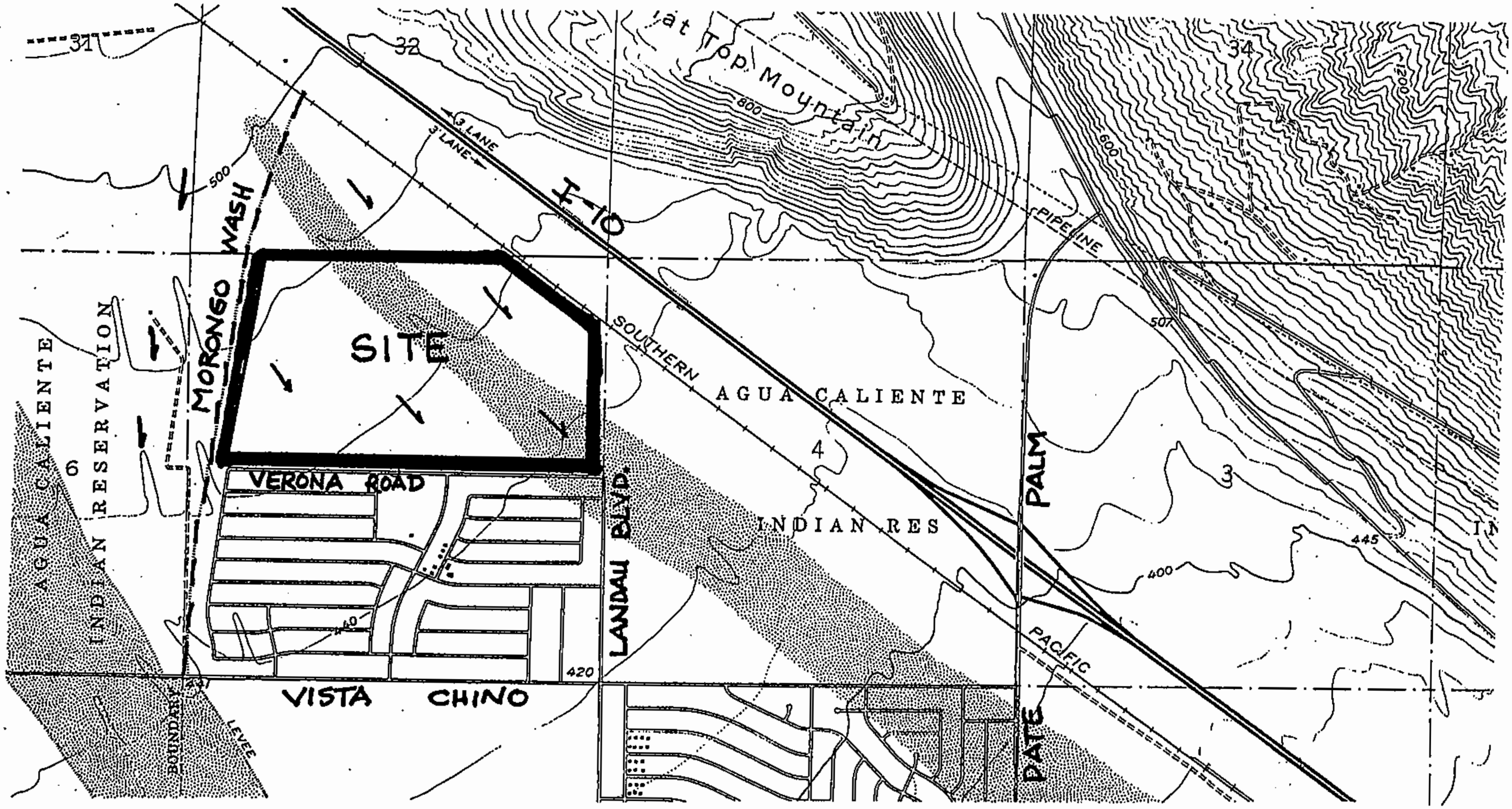
Drainage Area "K2" – Retention Area "B" is constructed in accordance with the Beach Club Precise Grading Plan for Rio Vista Village. Storm Drain Line K2-1 (30" & 27") are constructed per the Storm Drain Plans for Tract 28639-1. Storm drain flows and hydraulic grade lines are also shown on the Storm Drain Plans.

Conclusions

Based on results of this Drainage Report, it is concluded that:

1. Implementation of the proposed drainage facilities, as shown in this report, will provide Tract 28639-1 with 100-year flood protection from storm flows generated onsite.
2. The onsite 100-year storm flows will be intercepted and conveyed safely through proposed drainage facilities. These storm flows will be retained within the proposed retention basins.
3. In the event of storms larger than 100-year event, storm runoff will exceed the capacity of the retention basins, pond and safely overflow to Landau Boulevard.

Figures



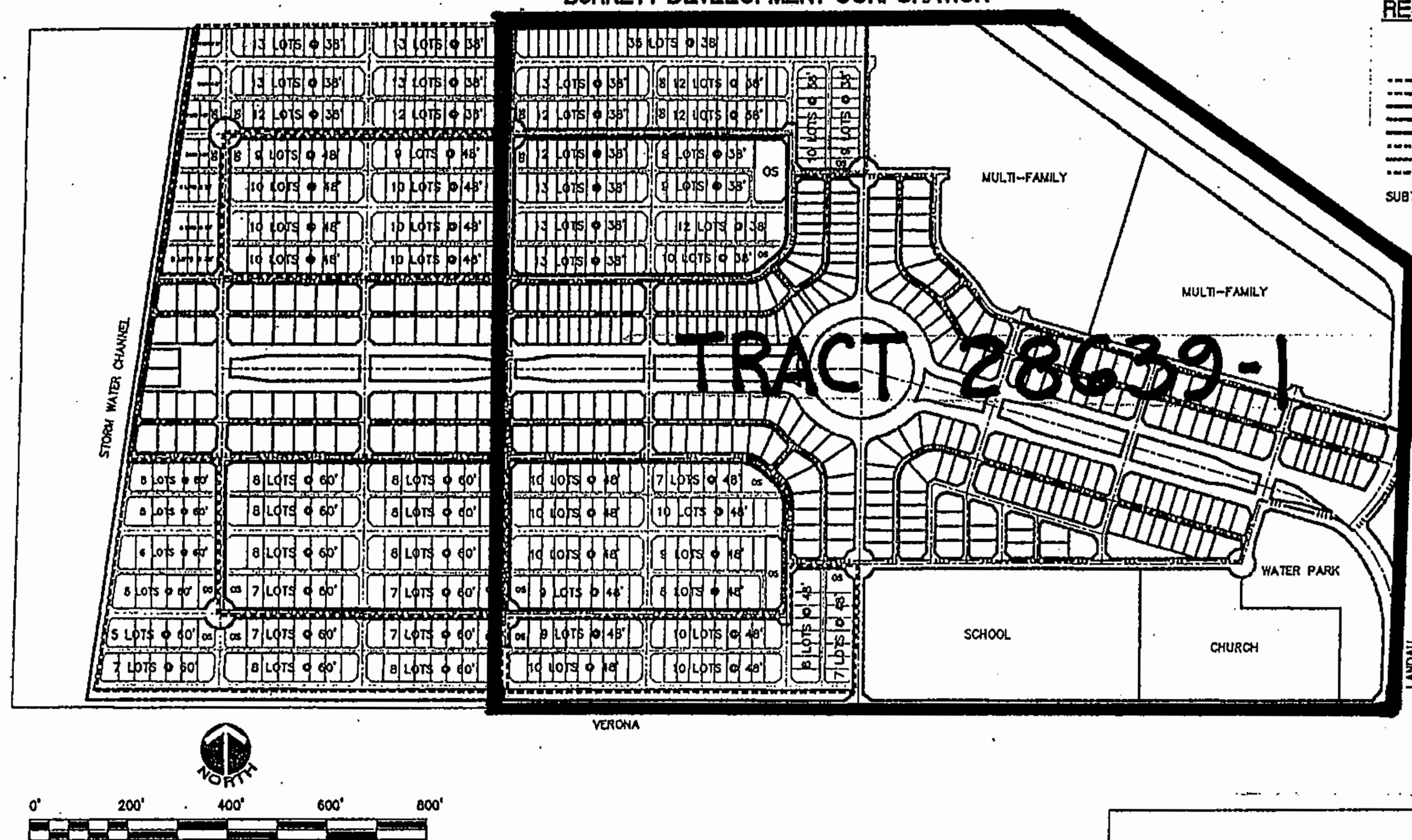
VICINITY MAP

Figure 1

TENTATIVE TRACT MAP NO. 28639

RIO VISTA VILLAGE

BURNETT DEVELOPMENT CORPORATION



RESIDENTIAL LOT ANALYSIS

LEGEND

Future Residential Lots	Open Space (OS)
54 LOTS @ 48'	.35 ACRES
63 LOTS @ 60'	.51 ACRES
62 LOTS @ 60'	.44 ACRES
73 LOTS @ 48'	.83 ACRES
91 LOTS @ 38'	.90 ACRES
78 LOTS @ 48'	.31 ACRES
103 LOTS @ 38'	.37 ACRES
97 LOTS @ 38'	.35 ACRES
SUBTOTAL 621 LOTS	4.06 ACRES

291 LOTS @ 38'
205 LOTS @ 48'
125 LOTS @ 60'

PHASE ONE
RESIDENTIAL LOTS = 268

PHASE TWO
RESIDENTIAL LOTS = 64

SUBTOTAL RESIDENTIAL LOTS
PHASE ONE AND PHASE TWO = 332

SUBTOTAL SINGLE FAMILY
RESIDENTIAL LOTS
PHASE ONE, TWO AND FUTURE = 953

MULTI-FAMILY
CLUSTER RESIDENTIAL = 162 UNITS
ATTACHED RESIDENTIAL = 204 UNITS
SUBTOTAL MULTI-FAMILY = 366 UNITS

TOTAL RESIDENTIAL = 1319 UNITS/LOTS

SPECIFIC PLAN
MAXIMUM DENSITY = 1362 UNITS/LOTS

LOT DIFFERENTIAL = 43

MADUENO, SMITH AND ASSOCIATES, INC.

FIGURE 2

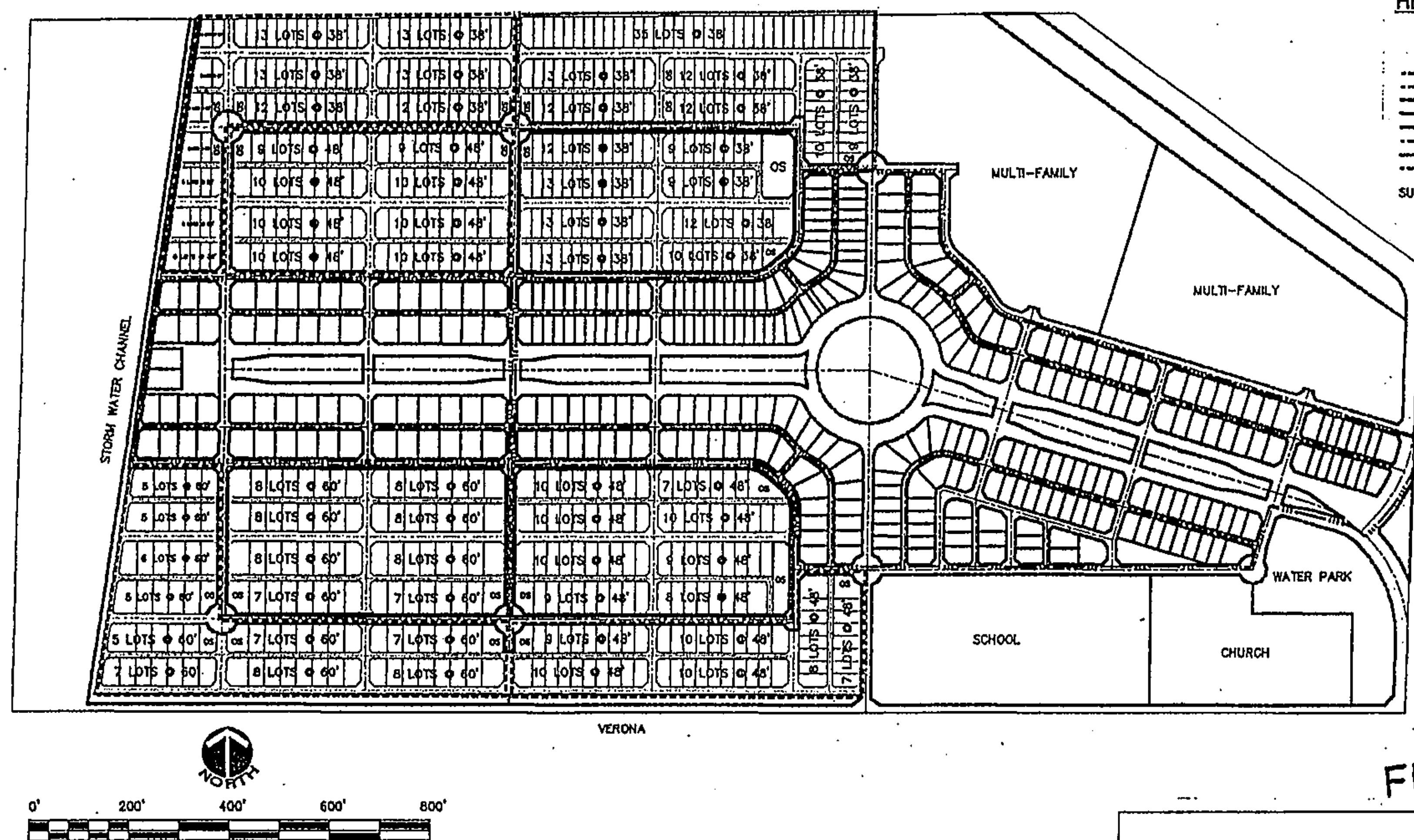
LAND USED PLAN

SCALE: N.T.S.	DATE: 1/19/2000	SHEET 1 OF 1

TENTATIVE TRACT MAP NO. 28639

RIO VISTA VILLAGE

BURNETT DEVELOPMENT CORPORATION



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54 LOTS @ 48'	.35 ACRES
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SUBTOTAL MULTI-FAMILY = 366 UNITS

TOTAL RESIDENTIAL = 1319 UNITS/LOTS

SPECIFIC PLAN
MAXIMUM DENSITY = 1362 UNITS/LOTS

LOT DIFFERENTIAL = 43

FIGURE 3

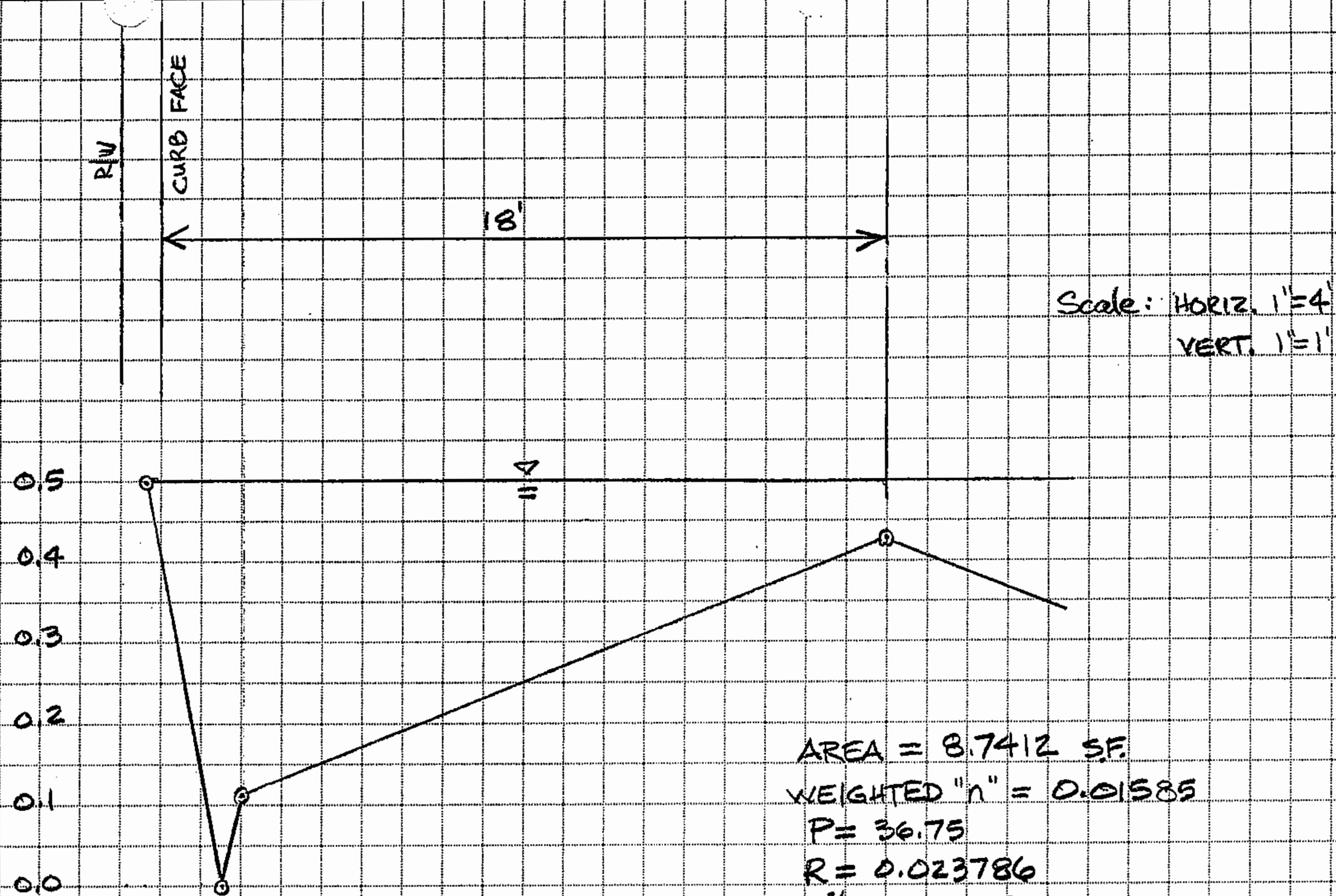
MAINIERO, SMITH AND ASSOCIATES, INC.

LAND USED PLAN

SCALE: N.T.S.	DATE: 1/19/2000	SHEET 1 OF 1

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB ______
SHEET NO. ______ OF ______
CALCULATED BY ______ DATE ______
CHECKED BY ______ DATE ______
SCALE ______



AREA = 8.7412 S.F.
WEIGHTED "n" = 0.01585
P = 36.75
R = 0.023786
$R^{2/3}$ = 0.38389

Manning's Eq.

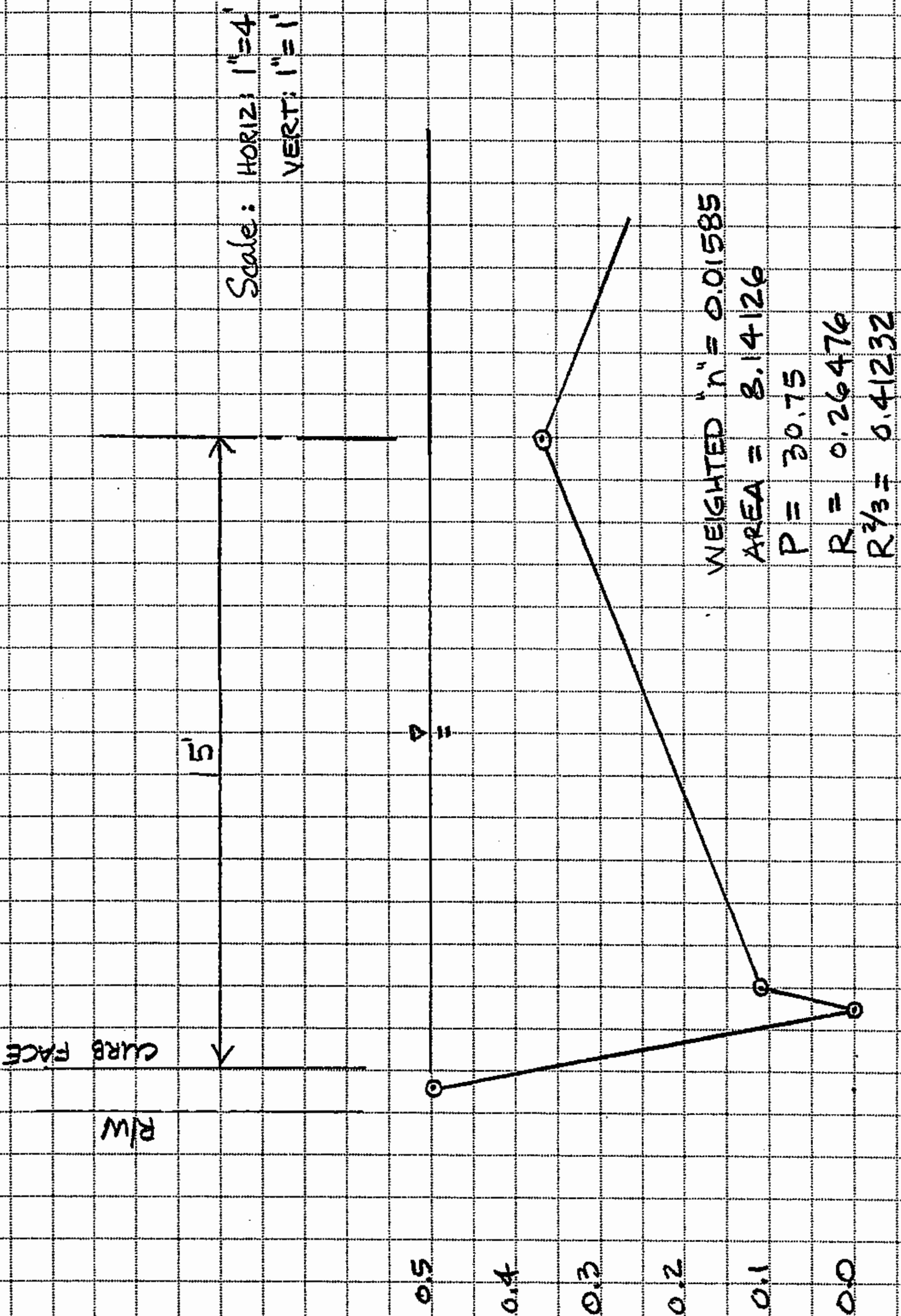
$$V = \frac{1.49}{n} R^{2/3} S^{1/2} \Rightarrow \boxed{Q = 315.45\ S^{1/2}}$$

TOP OF CURB CAPACITY OF 36' STREET

FIGURE 4

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB ____
SHEET NO. ____ OF ____
CALCULATED BY ____ DATE ____
CHECKED BY ____ DATE ____
SCALE ____



WEIGHTED "n" = 0.01585
AREA = 8.14126
P = 30.75
R = 0.264476
$R^{2/3} = 0.41232$

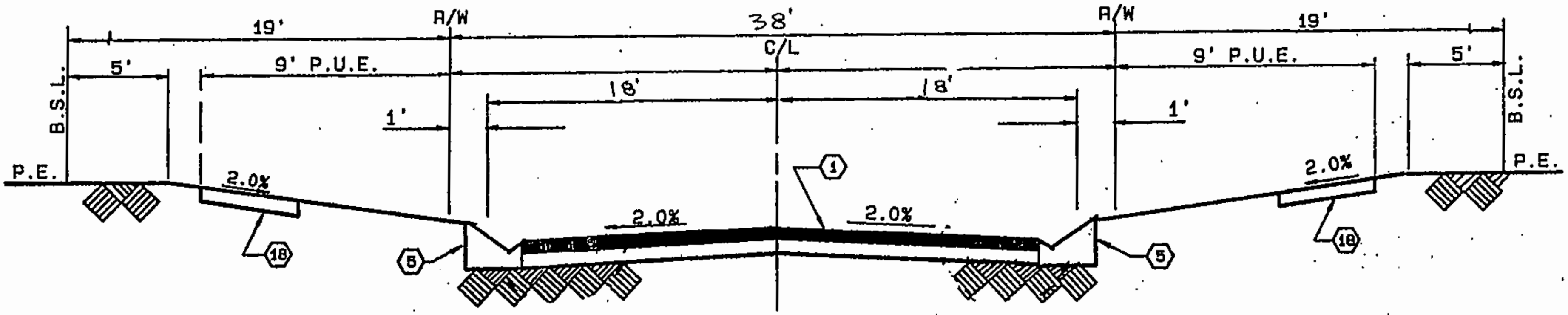
Manning's Eq.

$V = \frac{1.49}{n} R^{2/3} S^{1/2} \Rightarrow \boxed{Q = 315.56\, S^{1/2}}$

$Q = AV$

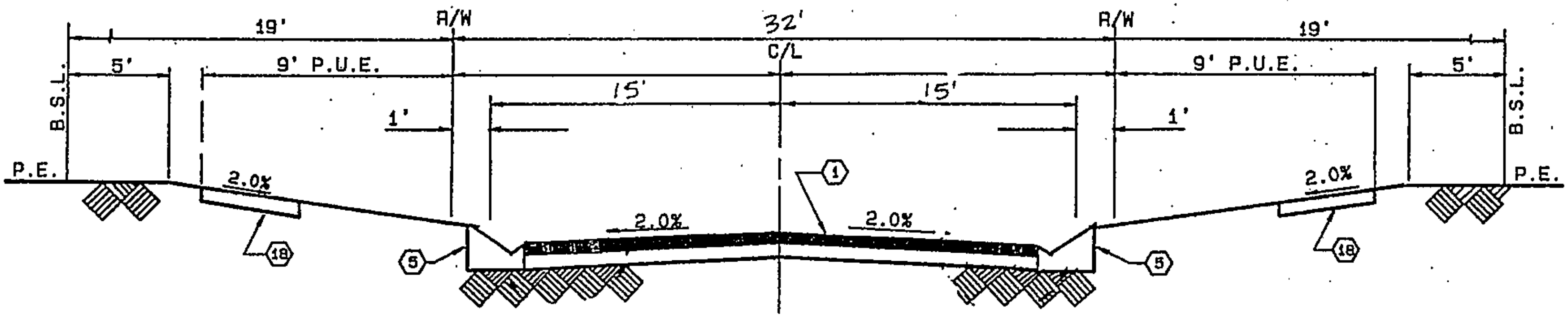
TOP OF CURB CAPACITY OF 30' STREET

FIGURE 5



TYPICAL STREET SECTION
NOT TO SCALE

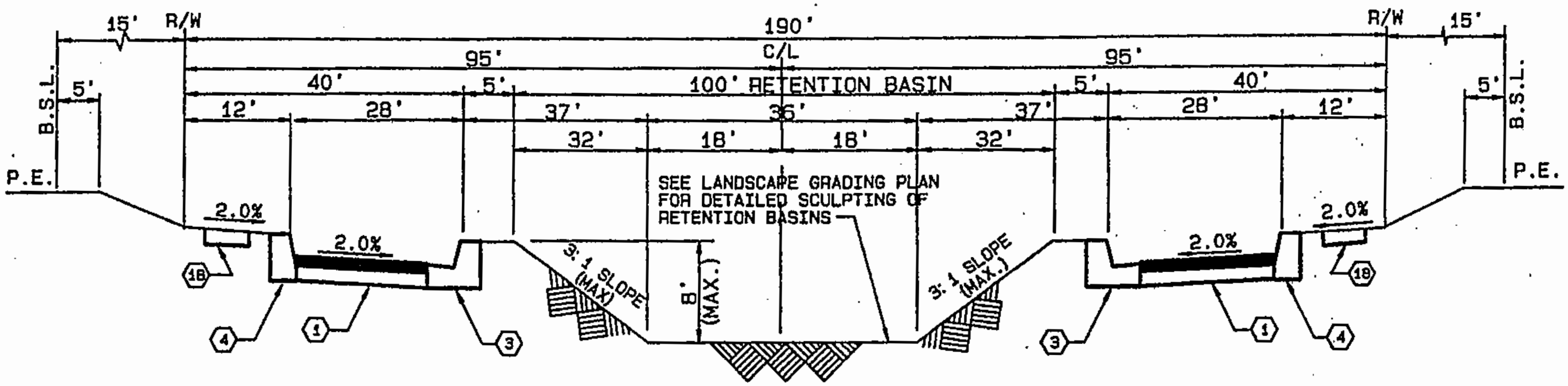
Figure 6



TYPICAL STREET SECTION
NOT TO SCALE

RIO FELECIA ROAD

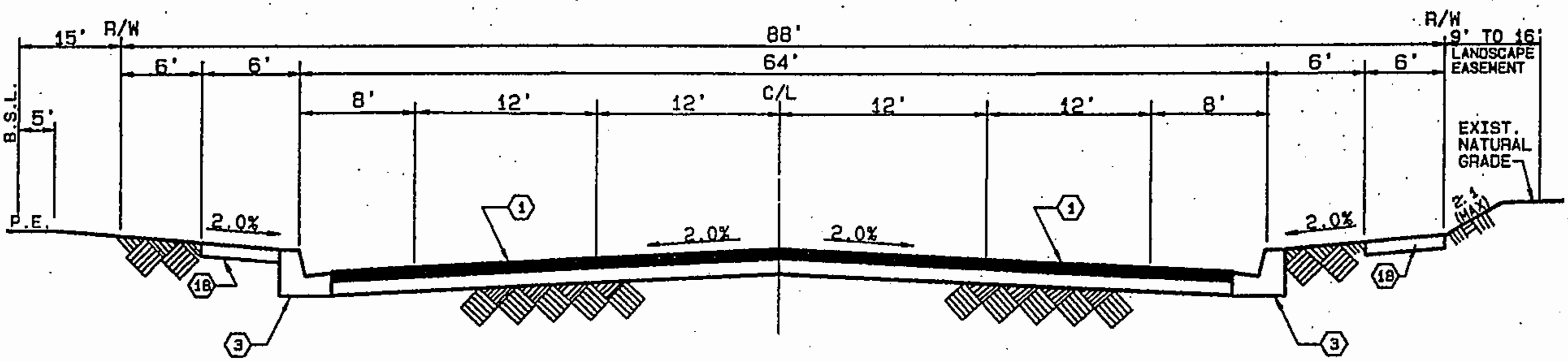
Figure 7



TYPICAL STREET SECTION C-C
NOT TO SCALE

RIO VISTA DRIVE - NORTH & SOUTH

Figure 8

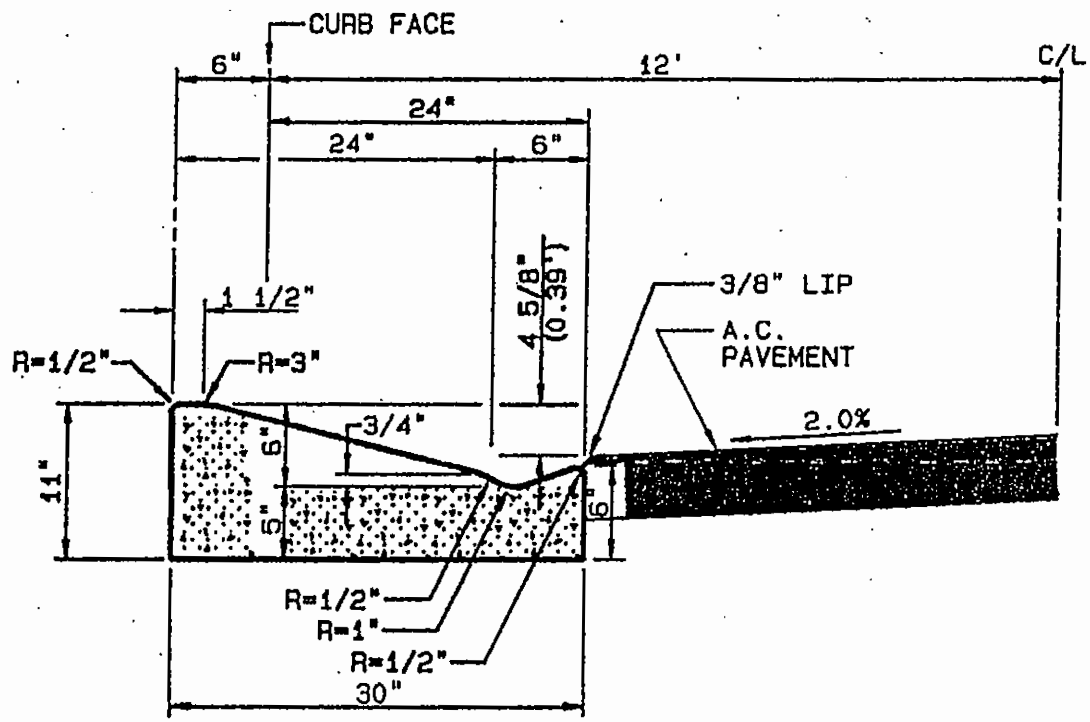


LANDAU BLVD.

TYPICAL STREET SECTION B-B

NOT TO SCALE

Figure 9



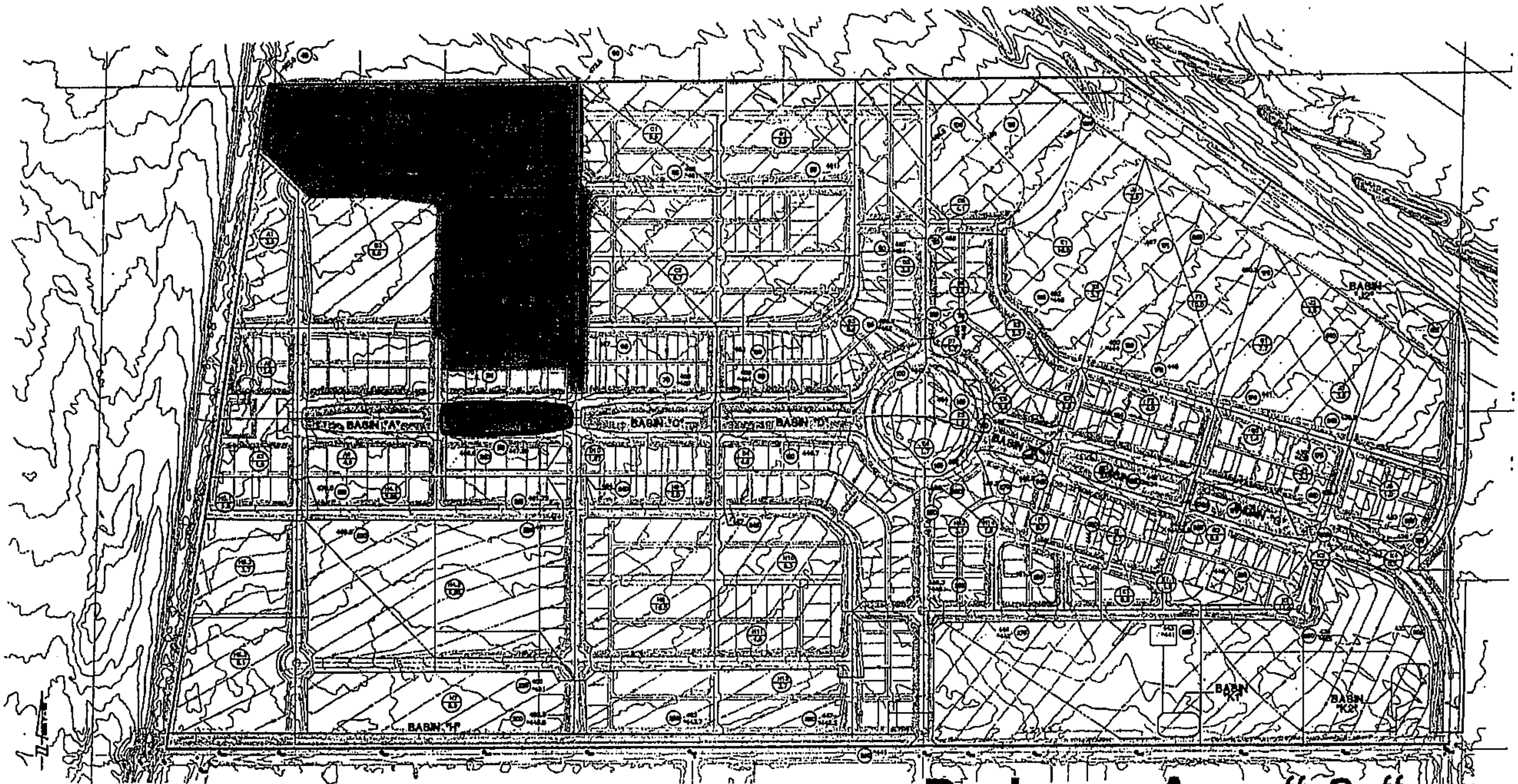
WEDGE CURB DETAIL–6" C.F. (5)

NOT TO SCALE

NOTES:

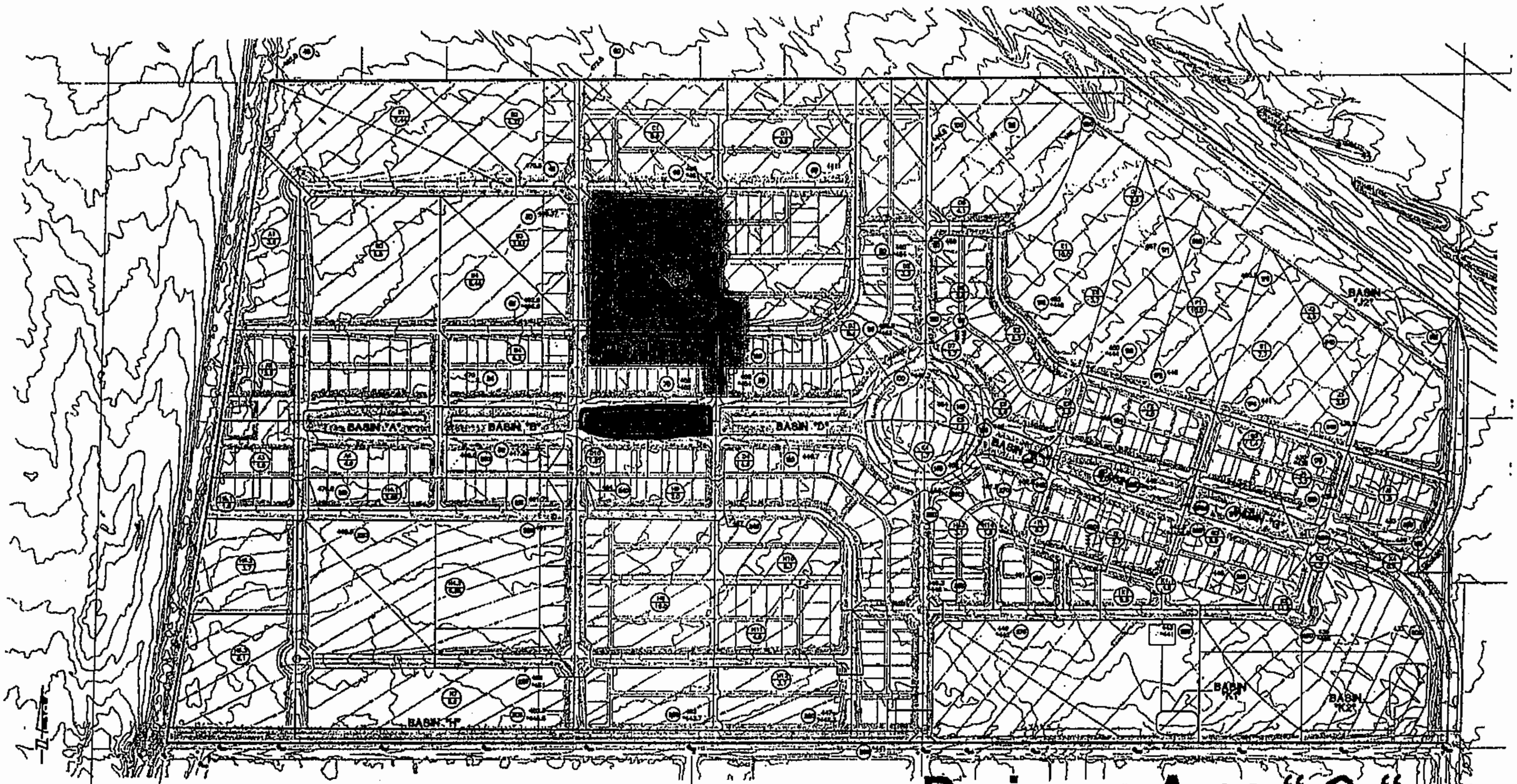
1. ALL CONCRETE SHALL BE 560–C–2800.
2. CURB FACE SHALL BE AS SPECIFIED ON PLANS.
3. WEAKENED PLANE JOINT EVERY 10' O.C.
4. EXPANSION PAPER REQUIRED EVERY 50' AT THE TOPS OF DRIVEWAY X'S AND AT ECR'S AND BCR'S.

Figure 10



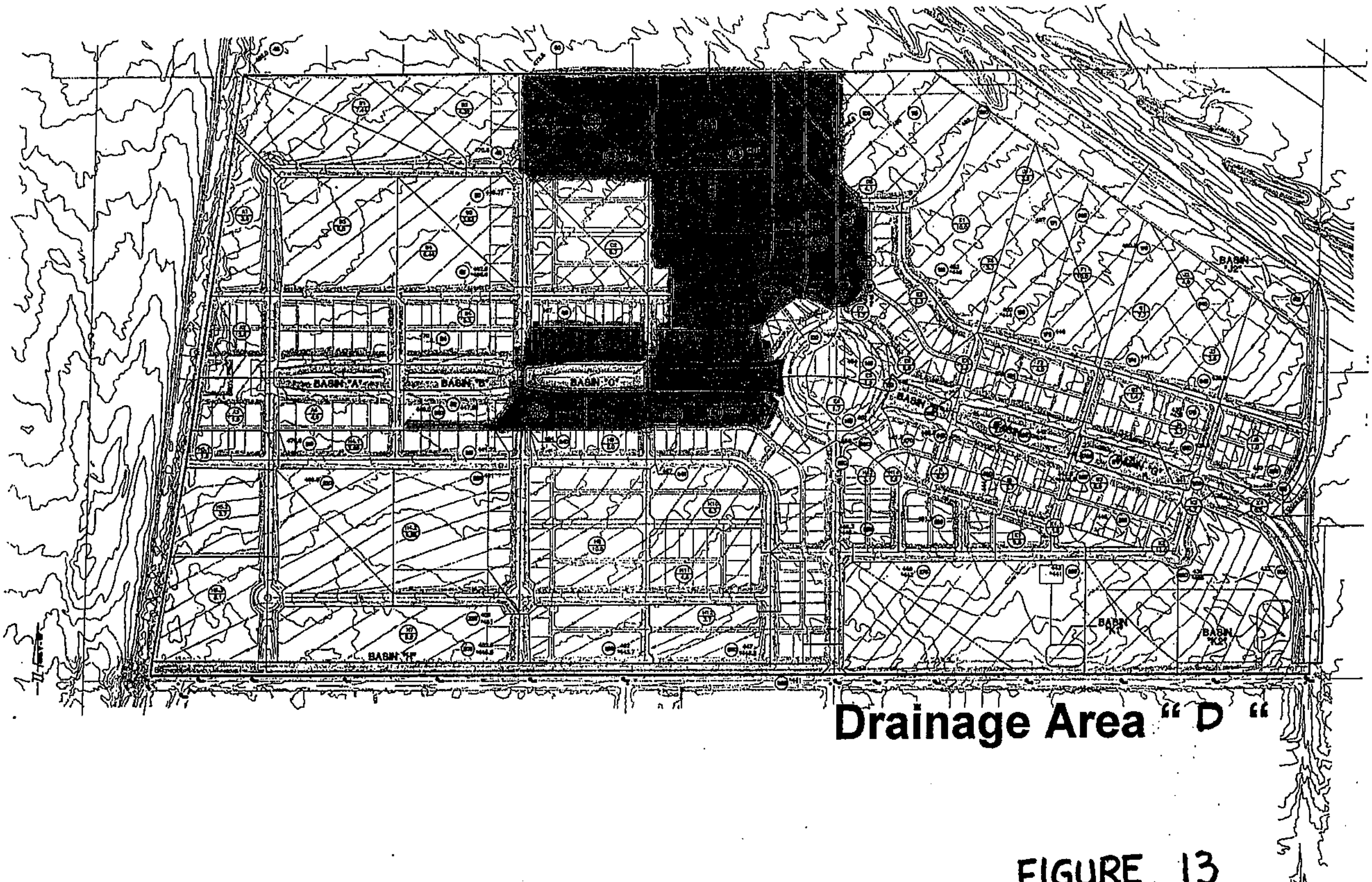
Drainage Area " B "

FIGURE 11



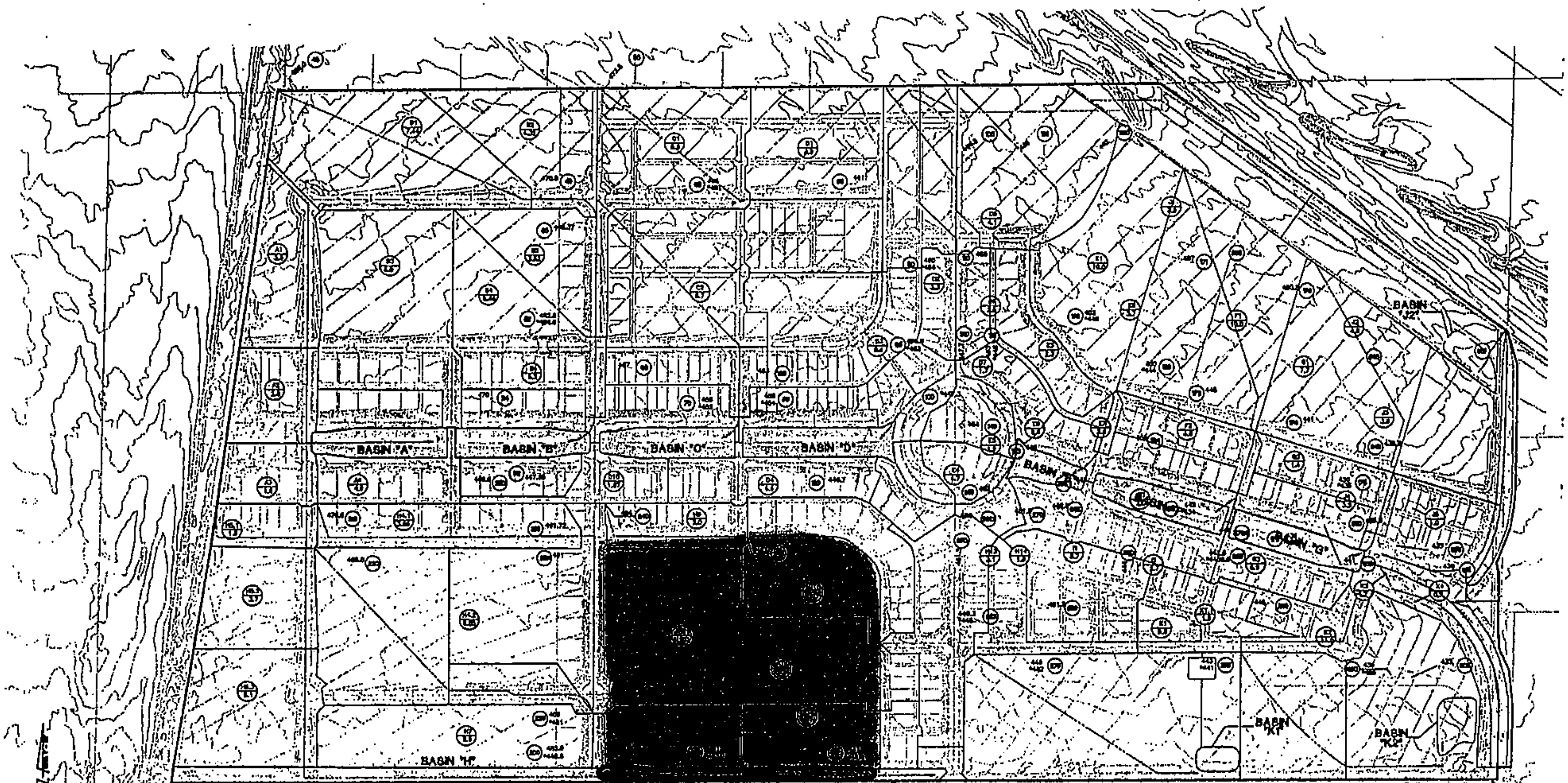
Drainage Area " C "

FIGURE 12



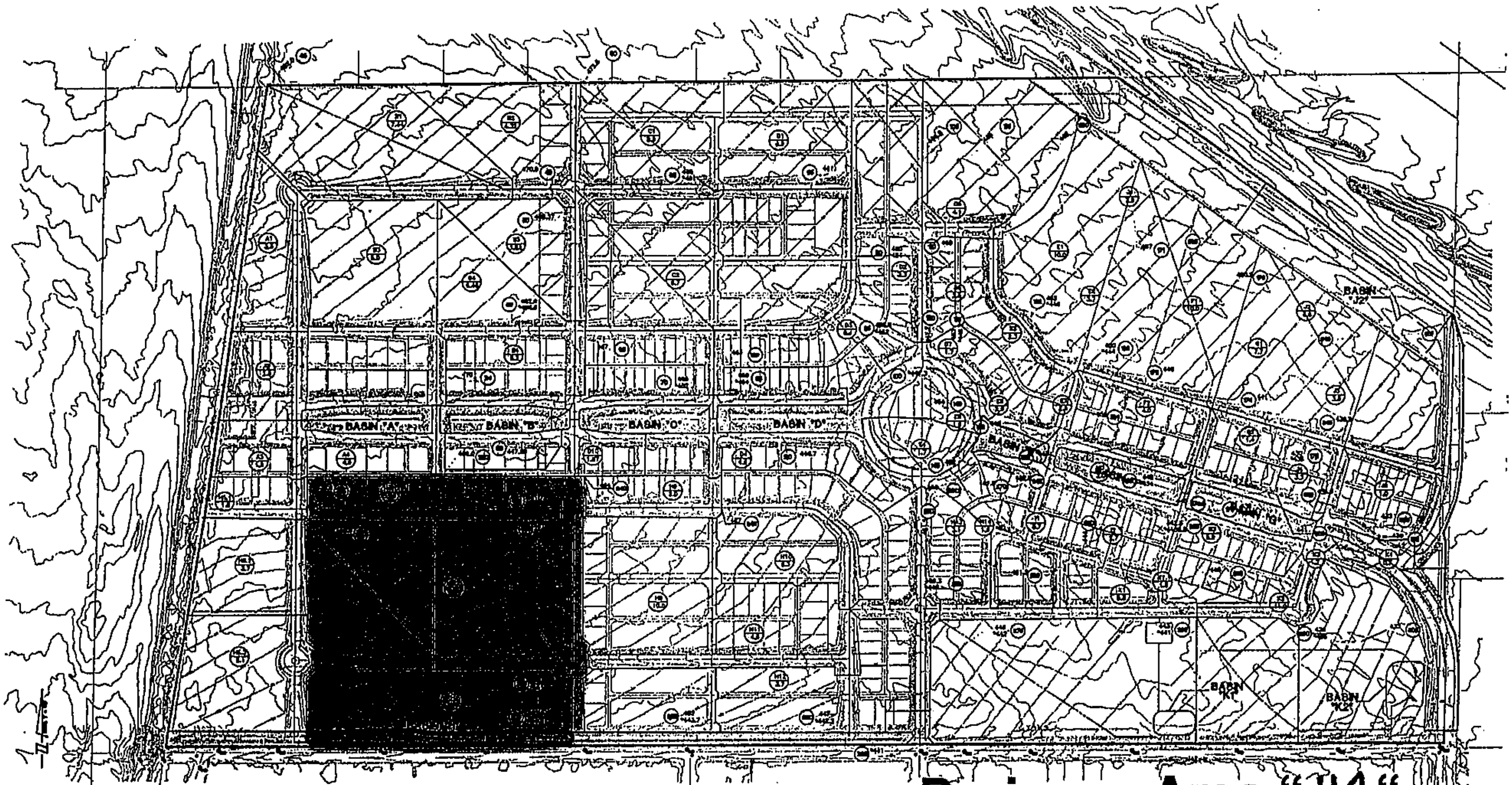
Drainage Area " D "

FIGURE 13



Drainage Area " H2 "

FIGURE 18



Drainage Area " H4 "

FIGURE 19

Unit Hydrograph Summary Chart

Basin	L	Lc	H	"n"	Area	Ret.	1/2 ac.	1/4 ac.	Condo	Apt.	Comm.	Fp	Fp	Low	Rain	Lag	Vol.
					Total								min.	Loss		Time	
B	2095	950	16.15	0.015	22.26	1.22			21.04			0.325	0.16	90	4.5	15	1.93
C	1055	565	13.4	0.015	10	1.28			8.46			0.35	0.175	90	4.5	15	0.79
D	2260	760	26.4	0.015	35.26	1.47		4.5	29.29			0.33	0.017	90	4.5	15	2.98
E	1770	750	16.4	0.015	25.45	0.66	8.21	2.22		14.36		0.328	0.164	90	4.5	15	2.18
F	1372	680	13.09	0.015	12.6	1.2		1.96		9.44		0.29	0.145	90	4.5	15	1.26
G	1400	420	15.78	0.015	21.85	1.21		12.71		7.17	0.76	0.39	0.195	90	4.5	15	1.49
H1	2100	880	17.11	0.015	10			8.69				0.41	0.205	90	4.5	15	0.63
H2	1930	500	17.2	0.015	23				23			0.41	0.205	90	4.5	15	1.44
H4	2000	500	14.96	0.015	24.49			24.49				0.41	0.205	90	4.5	15	1.54
I	1078	358	8.73	0.015	10	0.223			8.2			0.316	0.158	90	4.5	15	0.89
K2	1784	704	12.1	0.015	22.45		11.1	3.41		3.84	4.1	0.37	0.185	90	4.5	15	1.66

L = Length of watercourse
Lc = Length from Concentration Point to point opposite centroid of area
H = Elevation difference along watercourse
"n" = Manning's friction factor along watercourse
Area Total = Total tributary area (10 acres minimum)
Ret. = Retention area
1/2 ac. = Land use with approximately 40% impervious area
1/4 ac. = Land use with approximately 50% impervious area
Condo = Land use with approximately 65% impervious area
Apt. = Land use with approximately 80% impervious area
Comm. = Land use with approximately 90% impervious area
Fp = Uniform mean soil loss
Fp min. = Minimun soil loss rate
Low Loss = Low soil loss rate
Rain = Rainfall
Lag Time = Unit hydrograph time unit
Vol. = Runoff Volume for drainage area

Figure 22

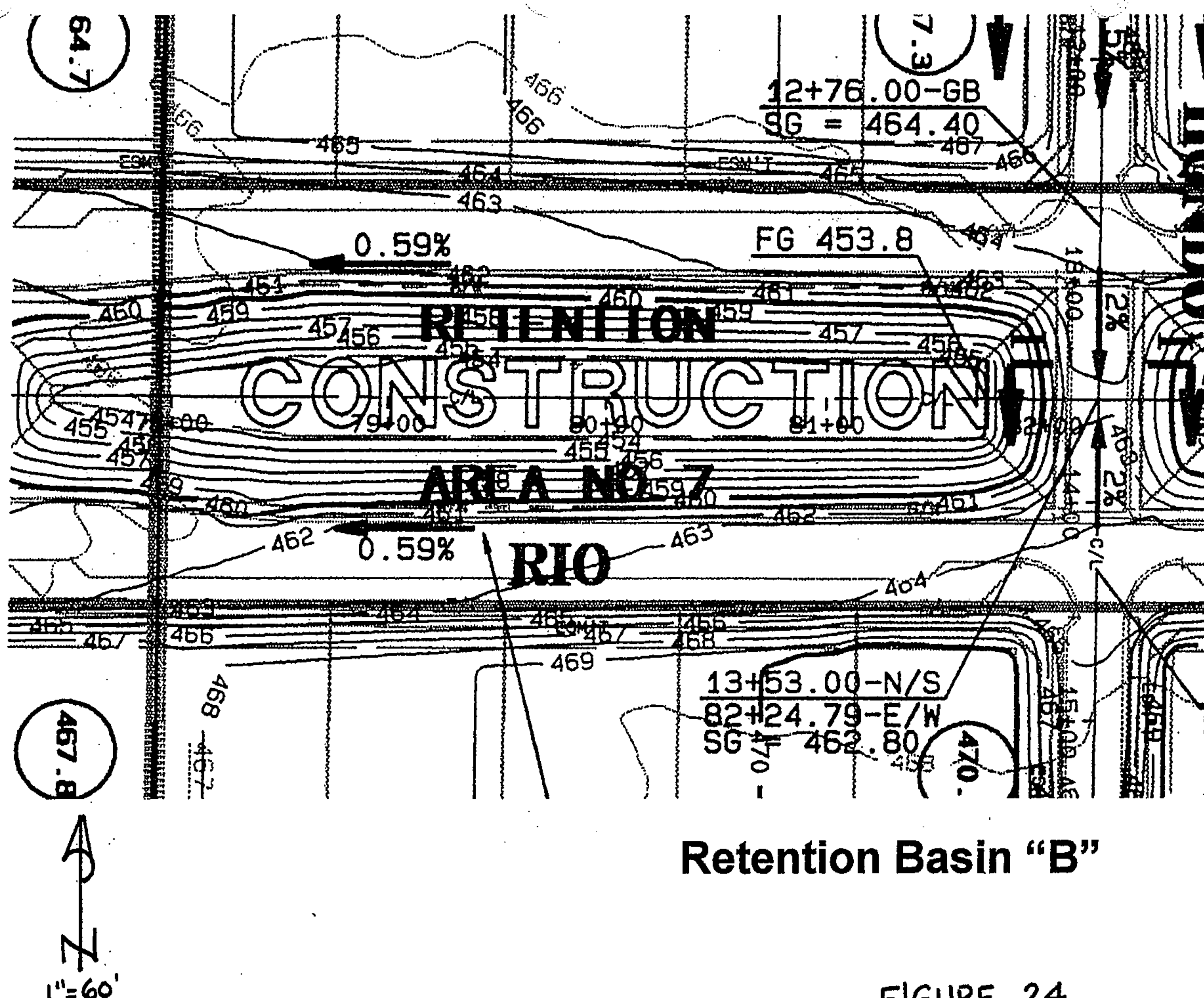
RETENTION BASIN "B" CAPACITY CHART

ELEVATION	AREA (AC)	INCREMENTAL VOLUME (A-F)	ACCUMULATED VOLUME (A-F)
454.0	0.3122	0	0
455.0	0.4245	0.36835	0.36835
456.0	0.5249	0.4747	0.84305 *
457.0	0.6306	0.57775	1.4208
458.0	0.7376	0.6841	2.1049 **
459.0	0.8519	0.79475	2.8996
460.0	0.9672	0.90955	3.80915

* 100 Year, 1 Hour Retention Volume
(See Shortcut Method for 100-year, 1-hour HGL) 0.462 A-F = WS 455.20

** 100 Year, 24 Hour Retention Volume
(See Synthetic Unit Hydrograph Calculations) 1.93 A-F = WS 457.74

FIGURE 23



Retention Basin "B"

FIGURE 24

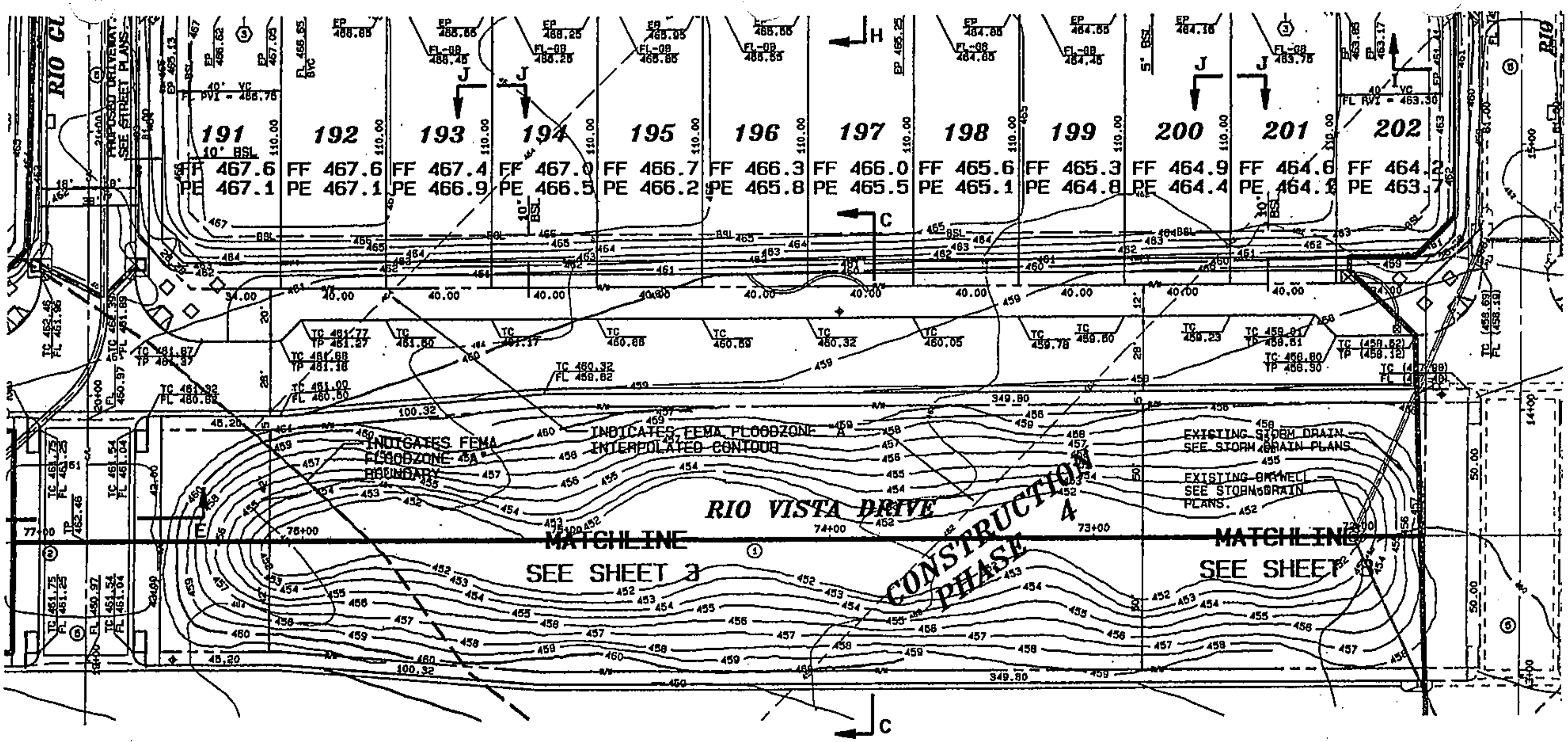
RETENTION BASIN "C" CAPACITY CHART

ELEVATION [illegible]	AREA (AC)	INCREMENTAL VOLUME (A-F)	ACCUMULATED VOLUME (A-F)
452.0	0.2590	0	0
453.0	0.3439	0.30145	0.30145 *
454.0	0.4512	0.3976	0.6990
455.0	0.5219	0.4866	1.1856 **
456.0	0.6168	0.5694	1.7549
457.0	0.7153	0.6660	2.421
458.0	0.8203	0.7678	3.189

* 100 Year, 1 Hour Retention Volume
(See Shortcut Method for 100-year, 1-hour HGL) 0.225 A-F = WS 452.75

** 100 Year, 24 Hour Retention Volume
(See Synthetic Unit Hydrograph Calculations) 0.790 A-F = WS 454.19

FIGURE 25



Retention Basin "C"

FIGURE 26

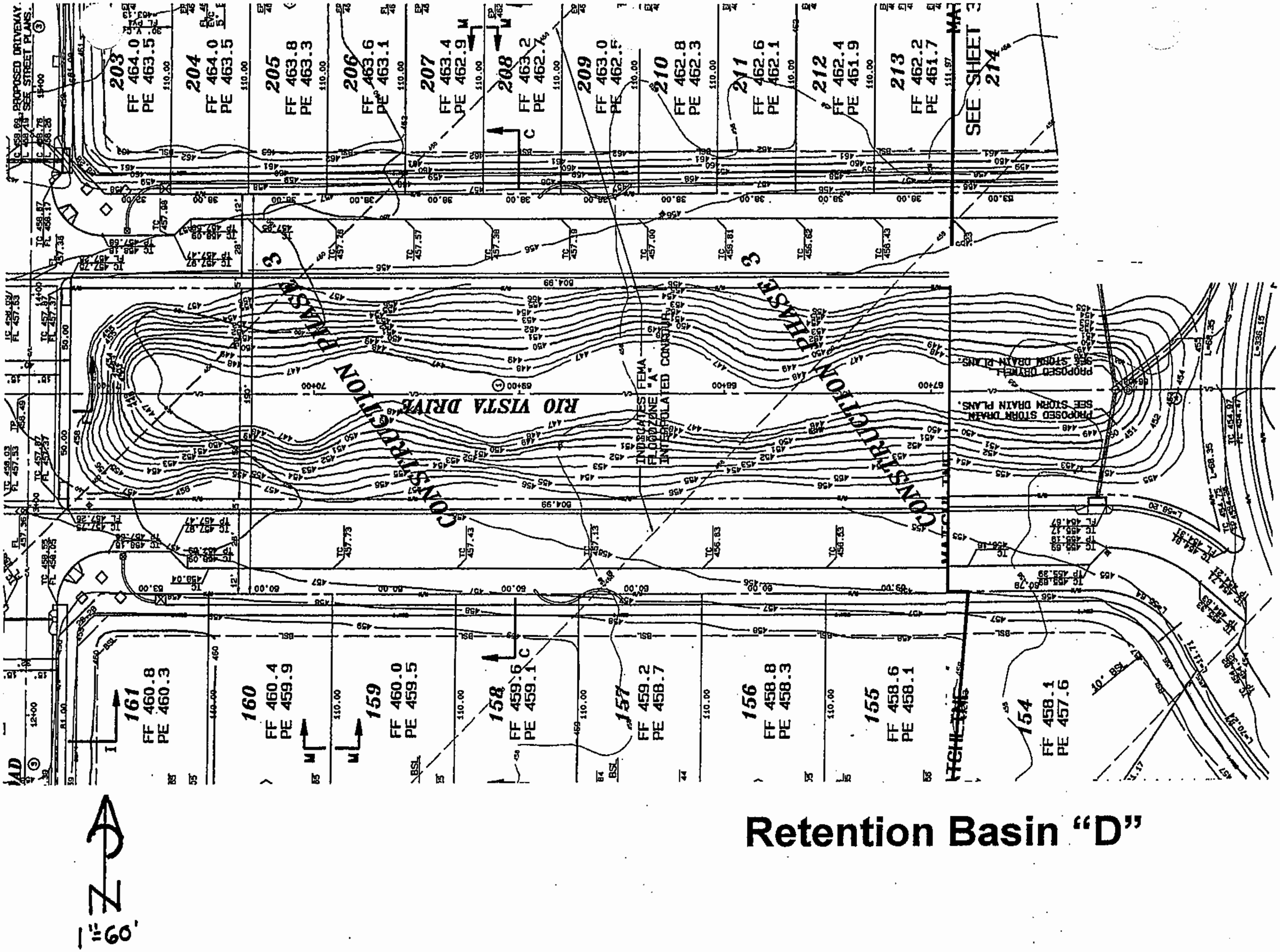
RETENTION BASIN "D" CAPACITY CHART

ELEVATION	AREA (AC)	INCREMENTAL VOLUME (A-F)	ACCUMULATED VOLUME (A-F)
447.0	0.2967	0.000	0
448.0	0.3680	0.3324	0.3324
449.0	0.4433	0.4057	0.738 *
450.0	0.5258	0.4845	1.2226
451.0	0.6134	0.5896	1.7922
452.0	0.7037	0.6585	2.45075
453.0	0.7991	0.7514	3.202 **
454.0	0.8940	0.8465	4.049
455.0	0.9943	0.94415	4.993

* 100 Year, 1 Hour Retention Volume
(See Shortcut Method for 100-year, 1-hour HGL) 0.733 A-F = WS 449.00

** 100 Year, 24 Hour Retention Volume
(See Synthetic Unit Hydrograph Calculations) 2.98 A-F = WS 452.71

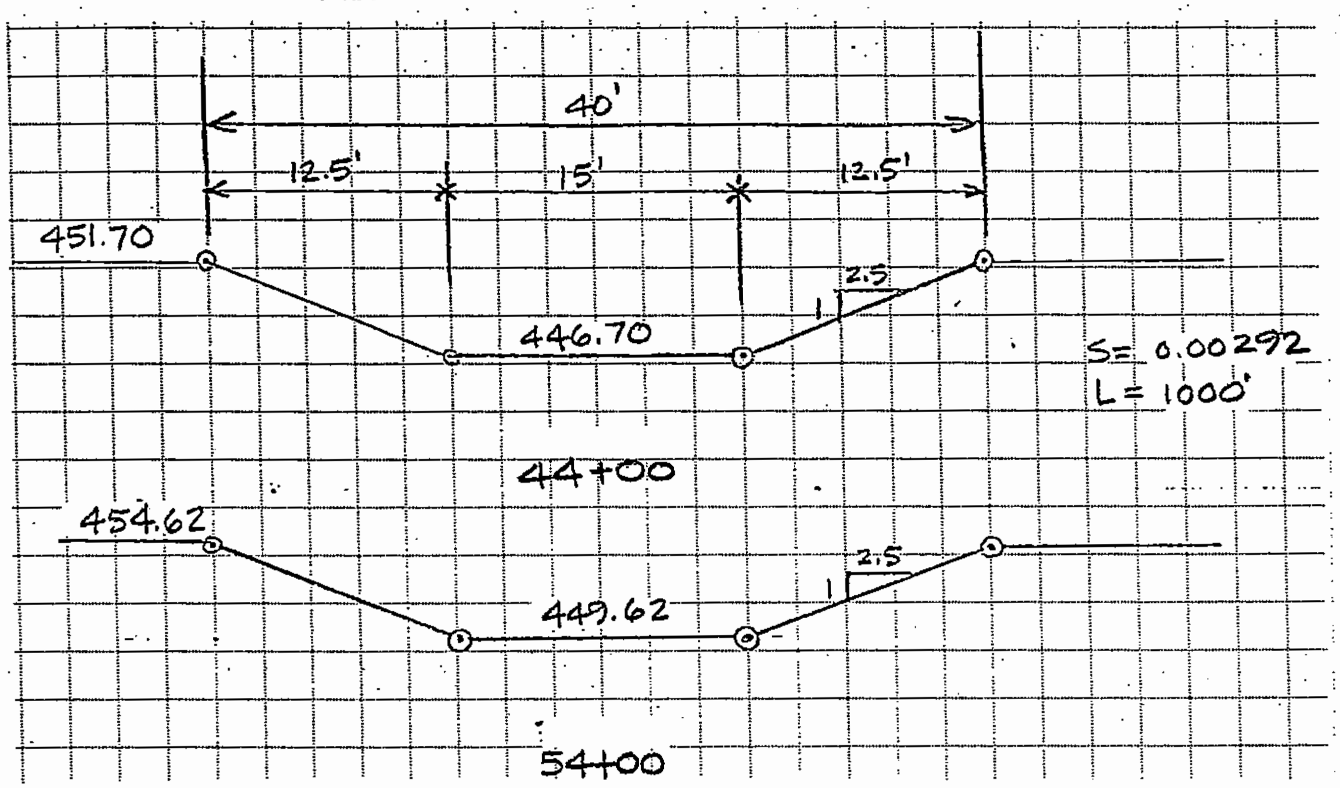
FIGURE 27



Retention Basin "D"

FIGURE 28

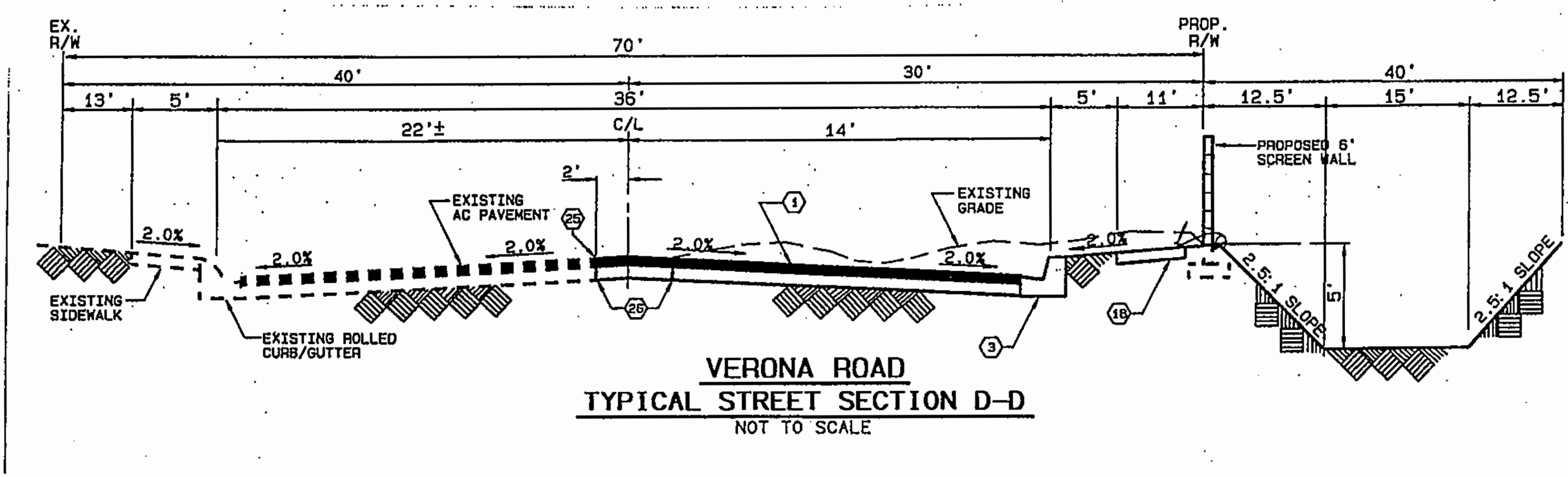
RETENTION BASIN "H4" CAPACITY CHART



DEPTH AT 44+00	DOWNSTREAM AREA at 44+00	UPSTREAM AREA at 54+00	VOLUME A-F
5' = 451.70	137.50	42.016	2.06056 **

** 100 Year, 24 Hour Retention Volume
(See Synthetic Unit Hydrograph Calculations) 1.54 A-F

FIGURE 39



VERONA ROAD

TYPICAL STREET SECTION D-D

NOT TO SCALE

Retention Basin "H4"

FIGURE 40

Rational Method Calculations
100-Year Storm

****

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL
(c) Copyright 1982-94 Advanced Engineering Software (aes)
Ver. 1.5A Release Date: 6/01/94 License ID 1304

Analysis prepared by:

MAINIERO, SMITH & ASSOCIATES, INC.
CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING
777 TAHQUIST CANYON WAY, SUITE 301
PALM SPRINGS, CALIFORNIA 92262-7066

************************* DESCRIPTION OF STUDY *************************
* Rio Vista Village - Tract 28639-1 *
* 100 Year Storm *
* Rational Method Calculations *
****

FILE NAME: 1064P.DAT
TIME/DATE OF STUDY: 9:46 3/20/2001

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = .85
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024
COMPUTED RAINFALL INTENSITY DATA:
STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.6000
SLOPE OF INTENSITY DURATION CURVE = .5796
RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

Begin Drainage Area "B"

****

FLOW PROCESS FROM NODE 40.00 TO NODE 45.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 1050.00
UPSTREAM ELEVATION = 482.00
DOWNSTREAM ELEVATION = 470.50
ELEVATION DIFFERENCE = 11.50
TC = .359*[(1050.00**3)/(11.50)]**.2 = 14.319
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.671
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7628
SUBAREA RUNOFF(CFS) = 21.67
TOTAL AREA(ACRES) = 7.74 TOTAL RUNOFF(CFS) = 21.67

****

FLOW PROCESS FROM NODE 45.00 TO NODE 50.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

```
================================================================================
 UPSTREAM ELEVATION =   470.50  DOWNSTREAM ELEVATION =   468.37
 STREET LENGTH(FEET) =  300.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  27.34
***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .55
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =  3.20
    PRODUCT OF DEPTH&VELOCITY =  1.77
 STREETFLOW TRAVELTIME(MIN) =  1.56  TC(MIN) =  15.88

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.457
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7581
 SUBAREA AREA(ACRES) =   4.32  SUBAREA RUNOFF(CFS) =  11.32
 SUMMED AREA(ACRES) =  12.06  TOTAL RUNOFF(CFS) =   33.00
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .59  HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) = 3.32  DEPTH*VELOCITY =  1.96


******************************************************************************
 FLOW PROCESS FROM NODE    50.00 TO NODE    51.00 IS CODE =  6
------------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 UPSTREAM ELEVATION =   468.37  DOWNSTREAM ELEVATION =   465.72
 STREET LENGTH(FEET) =  438.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  37.24
***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .61
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =  3.50
    PRODUCT OF DEPTH&VELOCITY =  2.14
 STREETFLOW TRAVELTIME(MIN) =  2.09  TC(MIN) =  17.97

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.218
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7525
 SUBAREA AREA(ACRES) =   3.52  SUBAREA RUNOFF(CFS) =   8.53
 SUMMED AREA(ACRES) =  15.58  TOTAL RUNOFF(CFS) =   41.52
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .63  HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) = 3.66  DEPTH*VELOCITY =  2.31
```

41.52 CFS ENTERS TWO
CATCH BASINS AT 23+53.50
RIO GUADALUPE. DEPTH = 0.63'
LINE B-1, MH 2 & MH 3

```
*****************************************************************************
 FLOW PROCESS FROM NODE    51.00 TO NODE    55.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==============================================================================
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.9 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  13.2
 UPSTREAM NODE ELEVATION =   458.47
 DOWNSTREAM NODE ELEVATION =   450.36
 FLOWLENGTH(FEET) =   306.49   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     41.52
 TRAVEL TIME(MIN.) =    .39    TC(MIN.) =  18.35
```

```
*****************************************************************************
 FLOW PROCESS FROM NODE    55.00 TO NODE    55.00 IS CODE =  8
 ----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.179
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7516
 SUBAREA AREA(ACRES) =     5.46   SUBAREA RUNOFF(CFS) =    13.04
 TOTAL AREA(ACRES) =     21.04   TOTAL RUNOFF(CFS) =    54.57
 TC(MIN) =  18.35
```

13.04 CFS ENTERS TWO CATCH BASINS AT 20+54 RIO GUADALUPE.
DEPTH = 0.41'
LINE B-2, MH 4
LINE B-3, MH 5

```
*****************************************************************************
 FLOW PROCESS FROM NODE    55.00 TO NODE    56.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==============================================================================
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.2 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  12.9
 UPSTREAM NODE ELEVATION =   449.77
 DOWNSTREAM NODE ELEVATION =   447.35
 FLOWLENGTH(FEET) =   121.35   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     54.57
 TRAVEL TIME(MIN.) =    .16    TC(MIN.) =  18.51
```

End Drainage Area "B"

Begin Drainage Area "C"

```
*****************************************************************************
 FLOW PROCESS FROM NODE    67.00 TO NODE    68.00 IS CODE = 21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   700.00
 UPSTREAM ELEVATION =    470.40
 DOWNSTREAM ELEVATION =    461.61
 ELEVATION DIFFERENCE =      8.79
 TC = .359*[(  700.00**3)/(    8.79)]**.2 =   11.847
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.097
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7712
 SUBAREA RUNOFF(CFS) =     20.03
 TOTAL AREA(ACRES) =      6.34   TOTAL RUNOFF(CFS) =     20.03
```

****

FLOW PROCESS FROM NODE 68.00 TO NODE 69.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

UPSTREAM ELEVATION = 461.61 DOWNSTREAM ELEVATION = 458.34
STREET LENGTH(FEET) = 242.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 15.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 13.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 23.20
STREET FLOWING FULL
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .49
HALFSTREET FLOODWIDTH(FEET) = 15.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.70
PRODUCT OF DEPTH&VELOCITY = 1.82
STREETFLOW TRAVELTIME(MIN) = 1.09 TC(MIN) = 12.94

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.894
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7673
SUBAREA AREA(ACRES) = 2.12 SUBAREA RUNOFF(CFS) = 6.33
SUMMED AREA(ACRES) = 8.46 TOTAL RUNOFF(CFS) = 26.37
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .49 HALFSTREET FLOODWIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 4.21 DEPTH*VELOCITY = 2.07

26.37 CFS ENTERS TWO CATCH BASINS AT 14+69 RIO FELICIA.
DEPTH = 0.49'.
LINE C, MH 1 & MH 2

****

FLOW PROCESS FROM NODE 69.00 TO NODE 70.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 24.0 INCH PIPE IS 15.0 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 12.8
UPSTREAM NODE ELEVATION = 451.33
DOWNSTREAM NODE ELEVATION = 447.75
FLOWLENGTH(FEET) = 114.63 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 26.37
TRAVEL TIME(MIN.) = .15 TC(MIN.) = 13.09

End Drainage Area "C"

Begin Drainage Area "D"

****

FLOW PROCESS FROM NODE 60.00 TO NODE 65.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 680.00
UPSTREAM ELEVATION = 473.40
DOWNSTREAM ELEVATION = 465.95
ELEVATION DIFFERENCE = 7.45
TC = .359*[(680.00**3)/(7.45)]**.2 = 12.034

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.060
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7705
 SUBAREA RUNOFF(CFS) =    18.08
 TOTAL AREA(ACRES) =     5.78  TOTAL RUNOFF(CFS) =     18.08

****************************************************************************
 FLOW PROCESS FROM NODE    65.00 TO NODE    85.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 ============================================================================
 UPSTREAM ELEVATION =   465.95  DOWNSTREAM ELEVATION =   462.19
 STREET LENGTH(FEET) =   537.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   24.56
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =  .53
     HALFSTREET FLOODWIDTH(FEET) =  18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.14
     PRODUCT OF DEPTH&VELOCITY =   1.67
 STREETFLOW TRAVELTIME(MIN) =   2.85   TC(MIN) =  14.89

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.589
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7610
 SUBAREA AREA(ACRES) =    4.77   SUBAREA RUNOFF(CFS) =   13.03
 SUMMED AREA(ACRES) =   10.55   TOTAL RUNOFF(CFS) =     31.11
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .57   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  3.37   DEPTH*VELOCITY =   1.93

****************************************************************************
 FLOW PROCESS FROM NODE    85.00 TO NODE    90.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 ============================================================================
 UPSTREAM ELEVATION =   462.19  DOWNSTREAM ELEVATION =   461.13
 STREET LENGTH(FEET) =   152.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   35.45
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =  .59
     HALFSTREET FLOODWIDTH(FEET) =  18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.57
```

PRODUCT OF DEPTH&VELOCITY = 2.11
STREETFLOW TRAVELTIME(MIN) = .71 TC(MIN) = 15.60

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.493
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7589
SUBAREA AREA(ACRES) = 3.27 SUBAREA RUNOFF(CFS) = 8.67
SUMMED AREA(ACRES) = 13.82 TOTAL RUNOFF(CFS) = 39.78
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .61 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 3.74 DEPTH*VELOCITY = 2.28

FLOW SPLITS AT THIS POINT, 19.89 CFS ENTERS THE CATCH BASIN AT 11+50 RIO OSO; 19.89 CFS HEADS EAST ON RIO ROSALIA. DEPTH = 0.61'
LINE D-3, MH 6

****

FLOW PROCESS FROM NODE 90.00 TO NODE 90.10 IS CODE = 7

THE FOLLOWING SECTIONS MODEL THE FLOW THAT ENTERS THE CATCH BASIN.

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

USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 15.60 RAIN INTENSITY(INCH/HOUR) = 3.49
TOTAL AREA(ACRES) = 6.91 TOTAL RUNOFF(CFS) = 19.89

****

FLOW PROCESS FROM NODE 90.10 TO NODE 91.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.1 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 8.9
UPSTREAM NODE ELEVATION = 456.85
DOWNSTREAM NODE ELEVATION = 451.30
FLOWLENGTH(FEET) = 383.99 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 19.89
TRAVEL TIME(MIN.) = .72 TC(MIN.) = 16.32

****

FLOW PROCESS FROM NODE 91.00 TO NODE 91.10 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 16.32
RAINFALL INTENSITY(INCH/HR) = 3.40
TOTAL STREAM AREA(ACRES) = 6.91
PEAK FLOW RATE(CFS) AT CONFLUENCE = 19.89

****

FLOW PROCESS FROM NODE 120.00 TO NODE 121.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 460.00
UPSTREAM ELEVATION = 466.00
DOWNSTREAM ELEVATION = 458.65
ELEVATION DIFFERENCE = 7.35
TC = .359*[(460.00**3)/(7.35)]**.2 = 9.544
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.644
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7806
SUBAREA RUNOFF(CFS) = 19.79
TOTAL AREA(ACRES) = 5.46 TOTAL RUNOFF(CFS) = 19.79

19.79 CFS ENTERS THE CATCH BASIN AT 15+25. RIO OSO. DEPTH = 0.7' LINE D-2, MH 5

```
****************************************************************************
 FLOW PROCESS FROM NODE   121.00 TO NODE   122.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  11.6 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  14.5
 UPSTREAM NODE ELEVATION =   453.89
 DOWNSTREAM NODE ELEVATION =   451.88
 FLOWLENGTH(FEET) =    38.00   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     19.79
 TRAVEL TIME(MIN.) =    .04    TC(MIN.) =   9.59

****************************************************************************
 FLOW PROCESS FROM NODE   122.00 TO NODE    91.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.59
 RAINFALL INTENSITY(INCH/HR) =   4.63
 TOTAL STREAM AREA(ACRES) =    5.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.79

 ** CONFLUENCE DATA **
 STREAM    RUNOFF     Tc      INTENSITY     AREA
 NUMBER     (CFS)    (MIN.)  (INCH/HOUR)   (ACRE)
    1       19.89   16.32     3.403          6.91
    2       19.79    9.59     4.632          5.46

*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**************************************************************************

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

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF     Tc      INTENSITY
 NUMBER     (CFS)    (MIN.)  (INCH/HOUR)
    1       31.48    9.59     4.632
    2       34.43   16.32     3.403

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     34.43  Tc(MIN.) =   16.32
 TOTAL AREA(ACRES) =     12.37

****************************************************************************
 FLOW PROCESS FROM NODE    91.10 TO NODE    92.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  12.6
 UPSTREAM NODE ELEVATION =   451.28
 DOWNSTREAM NODE ELEVATION =   444.02
 FLOWLENGTH(FEET) =   285.59   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     34.43
```

```
TRAVEL TIME(MIN.) =   .38   TC(MIN.) = 16.70

***************************************************************************
FLOW PROCESS FROM NODE   92.00 TO NODE   92.10 IS CODE =  1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) = 16.70
RAINFALL INTENSITY(INCH/HR) =  3.36
TOTAL STREAM AREA(ACRES) =  12.37
PEAK FLOW RATE(CFS) AT CONFLUENCE =    34.43
```

[redacted]

```
***************************************************************************
FLOW PROCESS FROM NODE   105.00 TO NODE   105.00 IS CODE =  7
----------------------------------------------------------------------------
>>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) =  15.60   RAIN INTENSITY(INCH/HOUR) =  3.49
TOTAL AREA(ACRES) =    6.91   TOTAL RUNOFF(CFS) =     19.89
```

THE FOLLOW SECTIONS MODEL THE 19.89 CFS THAT FLOW EAST ON RIO ROSALIA.

```
***************************************************************************
FLOW PROCESS FROM NODE   105.00 TO NODE   106.00 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =   461.89  DOWNSTREAM ELEVATION =   457.85
STREET LENGTH(FEET) =  336.00  CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
INTERIOR STREET CROSSFALL(DECIMAL) =   .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   22.99
 STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .49
    HALFSTREET FLOODWIDTH(FEET) =   17.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.58
    PRODUCT OF DEPTH&VELOCITY =    1.77
STREETFLOW TRAVELTIME(MIN) =   1.56   TC(MIN) =  17.16

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.305
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7546
SUBAREA AREA(ACRES) =    2.48   SUBAREA RUNOFF(CFS) =    6.18
SUMMED AREA(ACRES) =    9.39   TOTAL RUNOFF(CFS) =     26.07
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .51   HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) =  3.66   DEPTH*VELOCITY =   1.88

***************************************************************************
FLOW PROCESS FROM NODE   106.00 TO NODE   106.00 IS CODE =  8
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.305
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7546
SUBAREA AREA(ACRES) =    1.78   SUBAREA RUNOFF(CFS) =    4.44
TOTAL AREA(ACRES) =    11.17   TOTAL RUNOFF(CFS) =   30.51
TC(MIN) =  17.16
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   106.00 TO NODE   107.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =   457.85  DOWNSTREAM ELEVATION =   453.29
 STREET LENGTH(FEET) =  395.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  33.13
***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .55
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =  3.88
    PRODUCT OF DEPTH&VELOCITY =  2.15
 STREETFLOW TRAVELTIME(MIN) =  1.70   TC(MIN) =  18.86

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.129
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7503
 SUBAREA AREA(ACRES) =   2.23  SUBAREA RUNOFF(CFS) =   5.24
 SUMMED AREA(ACRES) =  13.40  TOTAL RUNOFF(CFS) =   35.75
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .55  HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) = 4.19  DEPTH*VELOCITY =  2.31
```

35.75 CFS ENTERS TWO
CATCH BASINS AT 26+07.88
AVE. QUINTANA
DEPTH = 0.55
LINE D-1, MH 2 & MH 3

```
****************************************************************************
 FLOW PROCESS FROM NODE   107.00 TO NODE   92.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 PIPEFLOW VELOCITY(FEET/SEC.) =  6.0
 UPSTREAM NODE ELEVATION =  444.84
 DOWNSTREAM NODE ELEVATION =  444.04
 FLOWLENGTH(FEET) =  201.12   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  33.00   NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =   35.75
 TRAVEL TIME(MIN.) =   .56   TC(MIN.) =  19.42


****************************************************************************
 FLOW PROCESS FROM NODE   92.00 TO NODE   92.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  19.42
 RAINFALL INTENSITY(INCH/HR) =   3.08
 TOTAL STREAM AREA(ACRES) =  13.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    35.75

 ** CONFLUENCE DATA **
 STREAM    RUNOFF    Tc    INTENSITY    AREA
```

```
NUMBER     (CFS)  (MIN.)  (INCH/HOUR)   (ACRE)
   1     34.43  16.70    3.358       12.37
   2     35.75  19.42    3.077       13.40

*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
***************************************************************************

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF     Tc     INTENSITY
 NUMBER     (CFS)   (MIN.)  (INCH/HOUR)
   1     65.18   16.70     3.358
   2     67.30   19.42     3.077

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     67.30  Tc(MIN.) =  19.42
 TOTAL AREA(ACRES) =     25.77


****************************************************************************
 FLOW PROCESS FROM NODE    92.10 TO NODE    93.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==========================================================================
 PIPEFLOW VELOCITY(FEET/SEC.) =  7.0
 UPSTREAM NODE ELEVATION =  443.28
 DOWNSTREAM NODE ELEVATION =  442.42
 FLOWLENGTH(FEET) =  215.65   MANNING'S N = .013
 GIVEN PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =     67.30
 TRAVEL TIME(MIN.) =    .51    TC(MIN.) =  19.93


****************************************************************************
 FLOW PROCESS FROM NODE    70.00 TO NODE    71.00 IS CODE =  21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  660.00
 UPSTREAM ELEVATION =    467.10
 DOWNSTREAM ELEVATION =    457.36
 ELEVATION DIFFERENCE =     9.74
 TC = .359*[( 660.00**3)/(    9.74)]**.2 =  11.203
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.232
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7737
 SUBAREA RUNOFF(CFS) =     6.22
 TOTAL AREA(ACRES) =     1.90   TOTAL RUNOFF(CFS) =     6.22


****************************************************************************
 FLOW PROCESS FROM NODE    71.00 TO NODE    72.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =    457.36   DOWNSTREAM ELEVATION =    454.75
 STREET LENGTH(FEET) =  520.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  14.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
```

OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 8.43
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .50
HALFSTREET FLOODWIDTH(FEET) = 18.48
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.39
PRODUCT OF DEPTH&VELOCITY = 1.18
STREETFLOW TRAVELTIME(MIN) = 3.63 TC(MIN) = 14.84

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.596
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7612
SUBAREA AREA(ACRES) = 1.62 SUBAREA RUNOFF(CFS) = 4.43
SUMMED AREA(ACRES) = 3.52 TOTAL RUNOFF(CFS) = 10.66
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .55 HALFSTREET FLOODWIDTH(FEET) = 20.96
FLOW VELOCITY(FEET/SEC.) = 2.36 DEPTH*VELOCITY = 1.29

10.66 CFS ENTERS THE CATCH BASIN AT 66+21.30 (N) RIO VISTA DRIVE. D = 0.55', LINE D-5, MH 1

****

FLOW PROCESS FROM NODE 72.00 TO NODE 93.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

===

DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.1 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 20.2
UPSTREAM NODE ELEVATION = 450.88
DOWNSTREAM NODE ELEVATION = 440.92
FLOWLENGTH(FEET) = 50.19 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 10.66
TRAVEL TIME(MIN.) = .04 TC(MIN.) = 14.88

****

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

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

===

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 980.00
UPSTREAM ELEVATION = 467.30
DOWNSTREAM ELEVATION = 459.08
ELEVATION DIFFERENCE = 8.22
TC = .393*[(980.00**3)/(8.22)]**.2 = 16.059
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.435
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6966
SUBAREA RUNOFF(CFS) = 4.00
TOTAL AREA(ACRES) = 1.67 TOTAL RUNOFF(CFS) = 4.00

****

FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

===

UPSTREAM ELEVATION = 459.08 DOWNSTREAM ELEVATION = 454.75
STREET LENGTH(FEET) = 782.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 28.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 14.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 6.75
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .46
HALFSTREET FLOODWIDTH(FEET) = 16.82
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.29
PRODUCT OF DEPTH&VELOCITY = 1.06
STREETFLOW TRAVELTIME(MIN) = 5.69 TC(MIN) = 21.75

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.881
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6769
SUBAREA AREA(ACRES) = 2.83 SUBAREA RUNOFF(CFS) = 5.52
SUMMED AREA(ACRES) = 4.50 TOTAL RUNOFF(CFS) = 9.52
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .51 HALFSTREET FLOODWIDTH(FEET) = 19.30
FLOW VELOCITY(FEET/SEC.) = 2.47 DEPTH*VELOCITY = 1.27

9.52 CFS ENTERS CATCH BASIN AT 66+21.30
(S) RIO VISTA DRIVE
D=0.51, LINE D-4, MH1

****

FLOW PROCESS FROM NODE 75.00 TO NODE 93.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.9 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 18.8
UPSTREAM NODE ELEVATION = 450.97
DOWNSTREAM NODE ELEVATION = 442.07
FLOWLENGTH(FEET) = 50.40 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 9.52
TRAVEL TIME(MIN.) = .04 TC(MIN.) = 21.79

End Drainage Area "D"

Begin Drainage Area "E"

****

FLOW PROCESS FROM NODE 131.00 TO NODE 131.10 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS APARTMENT
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 800.00
UPSTREAM ELEVATION = 464.80
DOWNSTREAM ELEVATION = 456.37
ELEVATION DIFFERENCE = 8.43
TC = .323*[(800.00**3)/(8.43)]**.2 = 11.628
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.142
SOIL CLASSIFICATION IS "A"
APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8269
SUBAREA RUNOFF(CFS) = 23.73
TOTAL AREA(ACRES) = 6.93 TOTAL RUNOFF(CFS) = 23.73

****

FLOW PROCESS FROM NODE 131.10 TO NODE 132.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 456.37 DOWNSTREAM ELEVATION = 450.70
STREET LENGTH(FEET) = 724.00 CURB HEIGHT(INCHES) = 6.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	13.64	11.70	4.127
2	16.35	19.56	3.063

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    16.35  Tc(MIN.) =  19.56
TOTAL AREA(ACRES) =     7.09

****************************************************************************
FLOW PROCESS FROM NODE   171.20 TO NODE   171.30 IS CODE =  4
----------------------------------------------------------------------------
>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
PIPEFLOW VELOCITY(FEET/SEC.) =  9.3
UPSTREAM NODE ELEVATION =  430.87
DOWNSTREAM NODE ELEVATION =  430.64
FLOWLENGTH(FEET) =    58.74  MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00    NUMBER OF PIPES =  1
PIPEFLOW THRU SUBAREA(CFS) =    16.35
TRAVEL TIME(MIN.) =    .11    TC(MIN.) =  19.67
```

End Drainage Area “G”

Begin Drainage Area “H1”

```
****************************************************************************
FLOW PROCESS FROM NODE   240.00 TO NODE   245.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH =   640.00
UPSTREAM ELEVATION =    464.00
DOWNSTREAM ELEVATION =    457.61
ELEVATION DIFFERENCE =      6.39
TC =  .393*[(  640.00**3)/(    6.39)]**.2 =  13.078
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.869
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7098
SUBAREA RUNOFF(CFS) =      5.35
TOTAL AREA(ACRES) =     1.95   TOTAL RUNOFF(CFS) =      5.35

****************************************************************************
FLOW PROCESS FROM NODE   245.00 TO NODE   250.00 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =    457.61   DOWNSTREAM ELEVATION =    451.60
STREET LENGTH(FEET) =   814.00   CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
INTERIOR STREET CROSSFALL(DECIMAL) =   .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   12.15
 STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .45
    HALFSTREET FLOODWIDTH(FEET) =   15.50
```

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.38
PRODUCT OF DEPTH&VELOCITY = 1.08
STREETFLOW TRAVELTIME(MIN) = 5.70 TC(MIN) = 18.78

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.137
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6865
SUBAREA AREA(ACRES) = 6.28 SUBAREA RUNOFF(CFS) = 13.52
SUMMED AREA(ACRES) = 8.23 TOTAL RUNOFF(CFS) = 18.88
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .51 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 2.65 DEPTH*VELOCITY = 1.36

FLOW SPLITS AT THIS POINT, 9.44 CFS FLOWS EAST ON WEST RIO LARGO, 9.44 CFS FLOWS SOUTH ON RIO MADRE

****

FLOW PROCESS FROM NODE 250.00 TO NODE 250.10 IS CODE = 7

THE FOLLOWING SECTIONS MODEL THE FLOW THAT FLOW EAST ON WEST RIO LARGO

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

USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 18.78 RAIN INTENSITY(INCH/HOUR) = 3.14
TOTAL AREA(ACRES) = 4.12 TOTAL RUNOFF(CFS) = 9.44

****

FLOW PROCESS FROM NODE 250.10 TO NODE 275.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

UPSTREAM ELEVATION = 451.60 DOWNSTREAM ELEVATION = 446.89
STREET LENGTH(FEET) = 690.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 13.70
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .47
HALFSTREET FLOODWIDTH(FEET) = 16.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.38
PRODUCT OF DEPTH&VELOCITY = 1.13
STREETFLOW TRAVELTIME(MIN) = 4.82 TC(MIN) = 23.60

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.748
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6715
SUBAREA AREA(ACRES) = 4.57 SUBAREA RUNOFF(CFS) = 8.43
SUMMED AREA(ACRES) = 8.69 TOTAL RUNOFF(CFS) = 17.87
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .51 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 2.51 DEPTH*VELOCITY = 1.29

17.87 CFS ENTERS TWO CATCH BASINS AT 11+34.81 AVE. QUINTANA
DEPTH = 0.51'
LINE H1, MH 7 & MH 2

****

FLOW PROCESS FROM NODE. 275.00 TO NODE 265.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 24.0 INCH PIPE IS 11.3 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 12.3
UPSTREAM NODE ELEVATION = 438.57
DOWNSTREAM NODE ELEVATION = 435.57
FLOWLENGTH(FEET) = 82.83 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 17.87

```
TRAVEL TIME(MIN.) =   .11   TC(MIN.) = 23.71
```

End Drainage Area "H1"

Begin Drainage Area "H2"

```
****************************************************************************
 FLOW PROCESS FROM NODE   250.00 TO NODE   250.00 IS CODE =  7
 ----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
 ============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  18.78   RAIN INTENSITY(INCH/HOUR) = 3.14
  TOTAL AREA(ACRES) =     4.12   TOTAL RUNOFF(CFS) =      9.44

****************************************************************************
 FLOW PROCESS FROM NODE   250.00 TO NODE   251.00 IS CODE =  6
 ----------------------------------------------------------------------------
  >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 ============================================================================
  UPSTREAM ELEVATION =    451.60   DOWNSTREAM ELEVATION =    449.76
  STREET LENGTH(FEET) =   235.00   CURB HEIGHT(INCHES) = 6.
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
  INTERIOR STREET CROSSFALL(DECIMAL) =   .020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

      **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   22.37
  ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS:
      NOTE: STREETFLOW EXCEEDS TOP OF CURB.
      THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
      THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
      THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
      STREET FLOWDEPTH(FEET) =   .51
      HALFSTREET FLOODWIDTH(FEET) =   18.00
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.14
      PRODUCT OF DEPTH&VELOCITY =     1.61
  STREETFLOW TRAVELTIME(MIN) =    1.25   TC(MIN) =  20.03

   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.022
  SOIL CLASSIFICATION IS "A"
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7476
  SUBAREA AREA(ACRES) =    11.49   SUBAREA RUNOFF(CFS) =   25.96
  SUMMED AREA(ACRES) =    15.61   TOTAL RUNOFF(CFS) =      35.40
  END OF SUBAREA STREETFLOW HYDRAULICS:
  DEPTH(FEET) =  .59   HALFSTREET FLOODWIDTH(FEET) = 18.00
  FLOW VELOCITY(FEET/SEC.) =  3.56   DEPTH*VELOCITY =   2.11

****************************************************************************
 FLOW PROCESS FROM NODE   251.00 TO NODE   252.00 IS CODE =  6
 ----------------------------------------------------------------------------
  >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 ============================================================================
  UPSTREAM ELEVATION =    449.76   DOWNSTREAM ELEVATION =    447.80
  STREET LENGTH(FEET) =   220.00   CURB HEIGHT(INCHES) = 6.
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
  INTERIOR STREET CROSSFALL(DECIMAL) =   .020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```

```
    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  43.53
***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .61
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   4.09
    PRODUCT OF DEPTH&VELOCITY =   2.50
 STREETFLOW TRAVELTIME(MIN) =   .90   TC(MIN) =  20.92

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.946
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7456
 SUBAREA AREA(ACRES) =    7.40   SUBAREA RUNOFF(CFS) =   16.26
 SUMMED AREA(ACRES) =   23.01   TOTAL RUNOFF(CFS) =    51.65
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .65   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  4.29   DEPTH*VELOCITY =   2.79
============================================================================
 END OF STUDY SUMMARY:
 PEAK FLOW RATE(CFS) =     51.65   Tc(MIN.) =   20.92
 TOTAL AREA(ACRES) =     23.01
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

End Drainage Area “H2”

Begin Drainage Area “H4”

```
****************************************************************************
 FLOW PROCESS FROM NODE   210.00 TO NODE   215.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  1090.00
 UPSTREAM ELEVATION =    470.00
 DOWNSTREAM ELEVATION =    461.72
 ELEVATION DIFFERENCE =      8.28
 TC =  .393*[( 1090.00**3)/(     8.28)]**.2 =   17.092
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.313
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6926
 SUBAREA RUNOFF(CFS) =      8.37
 TOTAL AREA(ACRES) =      3.65   TOTAL RUNOFF(CFS) =       8.37

****************************************************************************
 FLOW PROCESS FROM NODE   215.00 TO NODE   225.00 IS CODE =   6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =    461.72   DOWNSTREAM ELEVATION =     455.04
 STREET LENGTH(FEET) =   708.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```

```
    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   15.16
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =  .45
    HALFSTREET FLOODWIDTH(FEET) =  15.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.97
    PRODUCT OF DEPTH&VELOCITY =   1.35
 STREETFLOW TRAVELTIME(MIN) =   3.97   TC(MIN) =  21.07

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.935
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6790
 SUBAREA AREA(ACRES) =    6.85   SUBAREA RUNOFF(CFS) =   13.65
 SUMMED AREA(ACRES) =   10.50   TOTAL RUNOFF(CFS) =     22.02
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .51   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  3.09   DEPTH*VELOCITY =   1.59

****************************************************************************
 FLOW PROCESS FROM NODE   225.00 TO NODE   225.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 ============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  21.07
 RAINFALL INTENSITY(INCH/HR) =   2.93
 TOTAL STREAM AREA(ACRES) =   10.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.02

****************************************************************************
 FLOW PROCESS FROM NODE   220.00 TO NODE   221.00 IS CODE =  21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   750.00
 UPSTREAM ELEVATION =    469.00
 DOWNSTREAM ELEVATION =    459.50
 ELEVATION DIFFERENCE =      9.50
 TC = .393*[(  750.00**3)/(    9.50)]**.2 =   13.287
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.833
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7088
 SUBAREA RUNOFF(CFS) =     18.23
 TOTAL AREA(ACRES) =       6.71   TOTAL RUNOFF(CFS) =      18.23

****************************************************************************
 FLOW PROCESS FROM NODE   221.00 TO NODE   225.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 ============================================================================
 UPSTREAM ELEVATION =    459.50   DOWNSTREAM ELEVATION =    455.04
 STREET LENGTH(FEET) =   610.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   19.93
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
```

THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
STREET FLOWDEPTH(FEET) = .51
HALFSTREET FLOODWIDTH(FEET) = 18.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.80
PRODUCT OF DEPTH&VELOCITY = 1.44
STREETFLOW TRAVELTIME(MIN) = 3.64 TC(MIN) = 16.92

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.332
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6932
SUBAREA AREA(ACRES) = 1.47 SUBAREA RUNOFF(CFS) = 3.40
SUMMED AREA(ACRES) = 8.18 TOTAL RUNOFF(CFS) = 21.63
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .51 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 3.03 DEPTH*VELOCITY = 1.56

****

FLOW PROCESS FROM NODE 225.00 TO NODE 225.10 IS CODE = 1

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

==

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 16.92
RAINFALL INTENSITY(INCH/HR) = 3.33
TOTAL STREAM AREA(ACRES) = 8.18
PEAK FLOW RATE(CFS) AT CONFLUENCE = 21.63

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	22.02	21.07	2.935	10.50
2	21.63	16.92	3.332	8.18

**********************************WARNING**********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	39.32	16.92	3.332
2	41.07	21.07	2.935

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41.07 Tc(MIN.) = 21.07
TOTAL AREA(ACRES) = 18.68

****

FLOW PROCESS FROM NODE 225.10 TO NODE 200.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 455.04 DOWNSTREAM ELEVATION = 453.60
STREET LENGTH(FEET) = 210.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   46.70
***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =   .65
     HALFSTREET FLOODWIDTH(FEET) =  18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.88
     PRODUCT OF DEPTH&VELOCITY =    2.52
STREETFLOW TRAVELTIME(MIN) =    .90   TC(MIN) =  21.97

 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.864
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6762
 SUBAREA AREA(ACRES) =    5.81   SUBAREA RUNOFF(CFS) =   11.25
 SUMMED AREA(ACRES) =   24.49   TOTAL RUNOFF(CFS) =     52.33
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .67   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  4.10   DEPTH*VELOCITY =   2.75
```

End Drainage Area "H4"

Begin Drainage Area "I"

```
****************************************************************************
 FLOW PROCESS FROM NODE   315.00 TO NODE   320.00 IS CODE =  21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   840.00
 UPSTREAM ELEVATION =    453.10
 DOWNSTREAM ELEVATION =    445.18
 ELEVATION DIFFERENCE =       7.92
 TC = .359*[(  840.00**3)/(     7.92)]**.2 =   13.495
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.799
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7654
 SUBAREA RUNOFF(CFS) =     16.14
 TOTAL AREA(ACRES) =      5.55   TOTAL RUNOFF(CFS) =      16.14

****************************************************************************
 FLOW PROCESS FROM NODE   320.00 TO NODE   325.00 IS CODE =   6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =    445.18   DOWNSTREAM ELEVATION =     442.57
 STREET LENGTH(FEET) =   238.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   19.78
  STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =   .49
     HALFSTREET FLOODWIDTH(FEET) =  17.50
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.08
     PRODUCT OF DEPTH&VELOCITY =    1.52
```

Rational Method Calculations
10-Year Storm

```
*****************************************************************************
        RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                 (RCFC&WCD) 1978 HYDROLOGY MANUAL
       (c) Copyright 1982-94 Advanced Engineering Software (aes)
         Ver. 1.5A  Release Date: 6/01/94  License ID 1304

                  Analysis prepared by:

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************************** DESCRIPTION OF STUDY **************************
* Rio Vista Village - Tract 28639-1                                     *
* 10 Year Storm                                                   *
* Rational Method Calculations                                          *
**************************************************************************

  FILE NAME: 1064P.DAT
  TIME/DATE OF STUDY: 20:44   3/25/2001
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =  .85
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  .980
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  .5799047
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  .5796024
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  10.00   1-HOUR INTENSITY(INCH/HOUR) = .9898
  SLOPE OF INTENSITY DURATION CURVE = .5799
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
     AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
```

Begin Drainage Area "B"

```
*****************************************************************************
  FLOW PROCESS FROM NODE    40.00 TO NODE    45.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH =  1050.00
  UPSTREAM ELEVATION =   482.00
  DOWNSTREAM ELEVATION =   470.50
  ELEVATION DIFFERENCE =    11.50
  TC =  .359*[( 1050.00**3)/(   11.50)]**.2 =  14.319
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.272
  SOIL CLASSIFICATION IS "A"
  CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7252
  SUBAREA RUNOFF(CFS) =    12.75
  TOTAL AREA(ACRES) =      7.74   TOTAL RUNOFF(CFS) =      12.75

*****************************************************************************
  FLOW PROCESS FROM NODE    45.00 TO NODE    50.00 IS CODE =   6
----------------------------------------------------------------------------
  >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
```

```
=========================================================================
 UPSTREAM ELEVATION =   470.50  DOWNSTREAM ELEVATION =   468.37
 STREET LENGTH(FEET) =   300.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   16.03
  STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =   .49
     HALFSTREET FLOODWIDTH(FEET) =   17.50
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.50
     PRODUCT OF DEPTH&VELOCITY =    1.23
 STREETFLOW TRAVELTIME(MIN) =   2.00   TC(MIN) =  16.32

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.106
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7193
 SUBAREA AREA(ACRES) =    4.32   SUBAREA RUNOFF(CFS) =    6.54
 SUMMED AREA(ACRES) =   12.06   TOTAL RUNOFF(CFS) =     19.30
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .51   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  2.71   DEPTH*VELOCITY =    1.39

*****************************************************************************
 FLOW PROCESS FROM NODE    50.00 TO NODE    51.00 IS CODE =   6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
=========================================================================
 UPSTREAM ELEVATION =   468.37  DOWNSTREAM ELEVATION =   465.72
 STREET LENGTH(FEET) =   438.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   21.72
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =   .53
     HALFSTREET FLOODWIDTH(FEET) =   18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.77
     PRODUCT OF DEPTH&VELOCITY =    1.48
 STREETFLOW TRAVELTIME(MIN) =   2.63   TC(MIN) =  18.95

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.931
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7127
 SUBAREA AREA(ACRES) =    3.52   SUBAREA RUNOFF(CFS) =    4.84
 SUMMED AREA(ACRES) =   15.58   TOTAL RUNOFF(CFS) =     24.14
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .55   HALFSTREET FLOODWIDTH(FEET) = 18.00
 FLOW VELOCITY(FEET/SEC.) =  2.83   DEPTH*VELOCITY =    1.56

*****************************************************************************
 FLOW PROCESS FROM NODE    51.00 TO NODE    55.00 IS CODE =   4
----------------------------------------------------------------------------
```

SEE FIGURE 4

S=0.00605

⇒ STREET CAPACITY = 25.54 CFS

OK

```
>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==========================================================================
DEPTH OF FLOW IN 27.0 INCH PIPE IS 13.8 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 11.8
UPSTREAM NODE ELEVATION = 458.47
DOWNSTREAM NODE ELEVATION = 450.36
FLOWLENGTH(FEET) = 306.49  MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 27.00  NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 24.14
TRAVEL TIME(MIN.) = .43  TC(MIN.) = 19.39

****************************************************************************
FLOW PROCESS FROM NODE  55.00 TO NODE  55.00 IS CODE = 8
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.906
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7117
SUBAREA AREA(ACRES) = 5.46  SUBAREA RUNOFF(CFS) = 7.41
TOTAL AREA(ACRES) = 21.04  TOTAL RUNOFF(CFS) = 31.54
TC(MIN) = 19.39

****************************************************************************
FLOW PROCESS FROM NODE  55.00 TO NODE  56.00 IS CODE = 4
----------------------------------------------------------------------------
>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==========================================================================
DEPTH OF FLOW IN 33.0 INCH PIPE IS 15.7 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 11.3
UPSTREAM NODE ELEVATION = 449.77
DOWNSTREAM NODE ELEVATION = 447.35
FLOWLENGTH(FEET) = 121.35  MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 33.00  NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 31.54
TRAVEL TIME(MIN.) = .18  TC(MIN.) = 19.57
```

End Drainage Area "B"

Begin Drainage Area "C"

```
****************************************************************************
FLOW PROCESS FROM NODE  67.00 TO NODE  68.00 IS CODE = 21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 700.00
UPSTREAM ELEVATION = 470.40
DOWNSTREAM ELEVATION = 461.61
ELEVATION DIFFERENCE = 8.79
TC = .359*[( 700.00**3)/( 8.79)]**.2 = 11.847
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.536
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7338
SUBAREA RUNOFF(CFS) = 11.80
TOTAL AREA(ACRES) = 6.34  TOTAL RUNOFF(CFS) = 11.80

****************************************************************************
FLOW PROCESS FROM NODE  68.00 TO NODE  69.00 IS CODE = 6
```

```
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =   461.61  DOWNSTREAM ELEVATION =   458.34
 STREET LENGTH(FEET) =   242.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 15.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 13.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL) =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   13.65
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .42
    HALFSTREET FLOODWIDTH(FEET) =  13.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.33
    PRODUCT OF DEPTH&VELOCITY =   1.40
 STREETFLOW TRAVELTIME(MIN) =   1.21   TC(MIN) =  13.06

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.397
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7294
 SUBAREA AREA(ACRES) =    2.12   SUBAREA RUNOFF(CFS) =    3.71
 SUMMED AREA(ACRES) =    8.46   TOTAL RUNOFF(CFS) =    15.50
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) = .44   HALFSTREET FLOODWIDTH(FEET) = 14.59
 FLOW VELOCITY(FEET/SEC.) = 3.40  DEPTH*VELOCITY =   1.48

****************************************************************************
 FLOW PROCESS FROM NODE    69.00 TO NODE    70.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.9 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) = 11.2
 UPSTREAM NODE ELEVATION =   451.33
 DOWNSTREAM NODE ELEVATION =   447.75
 FLOWLENGTH(FEET) =   114.63   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPEFLOW THRU SUBAREA(CFS) =     15.50
 TRAVEL TIME(MIN.) =    .17    TC(MIN.) =  13.23
```

End Drainage Area "C"

Begin Drainage Area "D"

```
****************************************************************************
 FLOW PROCESS FROM NODE    60.00 TO NODE    65.00 IS CODE = 21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =   680.00
 UPSTREAM ELEVATION =   473.40
 DOWNSTREAM ELEVATION =    465.95
 ELEVATION DIFFERENCE =      7.45
 TC =  .359*[(  680.00**3)/(    7.45)]**.2 =   12.034
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.513
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7331
 SUBAREA RUNOFF(CFS) =     10.65
```

```
TOTAL AREA(ACRES) =     5.78  TOTAL RUNOFF(CFS) =     10.65

****************************************************************************
 FLOW PROCESS FROM NODE    65.00 TO NODE    85.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =   465.95  DOWNSTREAM ELEVATION =   462.19
 STREET LENGTH(FEET) =  537.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  14.39
  STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =  .47
     HALFSTREET FLOODWIDTH(FEET) =  16.50
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.51
     PRODUCT OF DEPTH&VELOCITY =   1.19
 STREETFLOW TRAVELTIME(MIN) =   3.57  TC(MIN) =  15.61

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.161
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7213
 SUBAREA AREA(ACRES) =   4.77  SUBAREA RUNOFF(CFS) =   7.44
 SUMMED AREA(ACRES) =  10.55  TOTAL RUNOFF(CFS) =    18.08
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) =  .49  HALFSTREET FLOODWIDTH(FEET) = 17.50
 FLOW VELOCITY(FEET/SEC.) =  2.82  DEPTH*VELOCITY =   1.39

****************************************************************************
 FLOW PROCESS FROM NODE    85.00 TO NODE    90.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =   462.19  DOWNSTREAM ELEVATION =   461.13
 STREET LENGTH(FEET) =  152.00  CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  20.55
 ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
     NOTE: STREETFLOW EXCEEDS TOP OF CURB.
     THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
     THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
     THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
     STREET FLOWDEPTH(FEET) =  .51
     HALFSTREET FLOODWIDTH(FEET) =  18.00
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.88
     PRODUCT OF DEPTH&VELOCITY =   1.48
 STREETFLOW TRAVELTIME(MIN) =   .88  TC(MIN) =  16.48

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.094
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7189
 SUBAREA AREA(ACRES) =   3.27  SUBAREA RUNOFF(CFS) =   4.92
 SUMMED AREA(ACRES) =  13.82  TOTAL RUNOFF(CFS) =    23.01
 END OF SUBAREA STREETFLOW HYDRAULICS:
```

```
DEPTH(FEET) = .53   HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 2.94   DEPTH*VELOCITY =  1.57
```

SEE FIGURE 4
S= 0.00697
STREET CAPACITY = 26.34 CFS
ok

```
****************************************************************************
 FLOW PROCESS FROM NODE    90.00 TO NODE    90.10 IS CODE =  7
 ----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  16.48   RAIN INTENSITY(INCH/HOUR) =  2.09
 TOTAL AREA(ACRES) =     6.91   TOTAL RUNOFF(CFS) =     11.51

****************************************************************************
 FLOW PROCESS FROM NODE    90.10 TO NODE    91.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.4 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  7.8
 UPSTREAM NODE ELEVATION =  456.85
 DOWNSTREAM NODE ELEVATION =  451.30
 FLOWLENGTH(FEET) =   383.99   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =     11.51
 TRAVEL TIME(MIN.) =    .82    TC(MIN.) =  17.30

****************************************************************************
 FLOW PROCESS FROM NODE    91.00 TO NODE    91.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  17.30
 RAINFALL INTENSITY(INCH/HR) =  2.04
 TOTAL STREAM AREA(ACRES) =    6.91
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.51

****************************************************************************
 FLOW PROCESS FROM NODE   120.00 TO NODE   121.00 IS CODE =  21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  460.00
 UPSTREAM ELEVATION =    466.00
 DOWNSTREAM ELEVATION =    458.65
 ELEVATION DIFFERENCE =      7.35
 TC =  .359*[(  460.00**3)/(     7.35)]**.2 =    9.544
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.874
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7436
 SUBAREA RUNOFF(CFS) =     11.67
 TOTAL AREA(ACRES) =      5.46   TOTAL RUNOFF(CFS) =     11.67

****************************************************************************
 FLOW PROCESS FROM NODE   121.00 TO NODE   122.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  21.0 INCH PIPE IS   8.5 INCHES
```

```
PIPEFLOW VELOCITY(FEET/SEC.) = 12.7
UPSTREAM NODE ELEVATION =  453.89
DOWNSTREAM NODE ELEVATION =  451.88
FLOWLENGTH(FEET) =   38.00  MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 21.00   NUMBER OF PIPES =  1
PIPEFLOW THRU SUBAREA(CFS) =    11.67
TRAVEL TIME(MIN.) =   .05   TC(MIN.) =  9.59

****************************************************************************
 FLOW PROCESS FROM NODE   122.00 TO NODE   91.10 IS CODE =  1
----------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  9.59
 RAINFALL INTENSITY(INCH/HR) =  2.87
 TOTAL STREAM AREA(ACRES) =   5.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.67

 ** CONFLUENCE DATA **
 STREAM    RUNOFF     Tc     INTENSITY    AREA
 NUMBER     (CFS)   (MIN.)  (INCH/HOUR)  (ACRE)
    1      11.51   17.30     2.036          6.91
    2      11.67    9.59     2.866          5.46

*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****************************************************************************

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

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF     Tc     INTENSITY
 NUMBER     (CFS)   (MIN.)  (INCH/HOUR)
    1      18.05    9.59    2.866
    2      19.80   17.30    2.036

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    18.05  Tc(MIN.) =    9.59
 TOTAL AREA(ACRES) =    12.37

****************************************************************************
 FLOW PROCESS FROM NODE    91.10 TO NODE    92.00 IS CODE =  4
----------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  11.8 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) = 10.8
 UPSTREAM NODE ELEVATION =  451.28
 DOWNSTREAM NODE ELEVATION =  444.02
 FLOWLENGTH(FEET) =  285.59   MANNING'S N = .013
 GIVEN PIPE DIAMETER(INCH) = 27.00    NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =    18.05
 TRAVEL TIME(MIN.) =   .44    TC(MIN.) = 10.04

****************************************************************************
 FLOW PROCESS FROM NODE    92.00 TO NODE    92.10 IS CODE =  1
----------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS = 2
```

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  10.04
RAINFALL INTENSITY(INCH/HR) =   2.79
TOTAL STREAM AREA(ACRES) =   12.37
PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.05

****************************************************************************
FLOW PROCESS FROM NODE   105.00 TO NODE   105.00 IS CODE =  7
----------------------------------------------------------------
>>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) =  16.48   RAIN INTENSITY(INCH/HOUR) =  2.09
TOTAL AREA(ACRES) =     6.91   TOTAL RUNOFF(CFS) =     11.51

****************************************************************************
FLOW PROCESS FROM NODE   105.00 TO NODE   106.00 IS CODE =  6
----------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =    461.89   DOWNSTREAM ELEVATION =    457.85
STREET LENGTH(FEET) =   336.00   CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
INTERIOR STREET CROSSFALL(DECIMAL) =   .020
OUTSIDE STREET CROSSFALL(DECIMAL) =   .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =   13.25
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =   .43
    HALFSTREET FLOODWIDTH(FEET) =   14.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.94
    PRODUCT OF DEPTH&VELOCITY =    1.28
STREETFLOW TRAVELTIME(MIN) =    1.90   TC(MIN) =  18.38

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.965
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7140
SUBAREA AREA(ACRES) =     2.48   SUBAREA RUNOFF(CFS) =     3.48
SUMMED AREA(ACRES) =      9.39   TOTAL RUNOFF(CFS) =      14.99
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .43   HALFSTREET FLOODWIDTH(FEET) = 14.50
FLOW VELOCITY(FEET/SEC.) =  3.33   DEPTH*VELOCITY =   1.44

****************************************************************************
FLOW PROCESS FROM NODE   106.00 TO NODE   106.00 IS CODE =  8
----------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.965
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7140
SUBAREA AREA(ACRES) =     1.78   SUBAREA RUNOFF(CFS) =     2.50
TOTAL AREA(ACRES) =      11.17   TOTAL RUNOFF(CFS) =     17.49
TC(MIN) =  18.38

****************************************************************************
FLOW PROCESS FROM NODE   106.00 TO NODE   107.00 IS CODE =  6
----------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM ELEVATION =    457.85   DOWNSTREAM ELEVATION =    453.29
STREET LENGTH(FEET) =   395.00   CURB HEIGHT(INCHES) = 6.
```

STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 18.95
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .47
HALFSTREET FLOODWIDTH(FEET) = 16.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.30
PRODUCT OF DEPTH&VELOCITY = 1.56
STREETFLOW TRAVELTIME(MIN) = 1.99 TC(MIN) = 20.38

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.852
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7095
SUBAREA AREA(ACRES) = 2.23 SUBAREA RUNOFF(CFS) = 2.93
SUMMED AREA(ACRES) = 13.40 TOTAL RUNOFF(CFS) = 20.42
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .49 HALFSTREET FLOODWIDTH(FEET) = 17.50
FLOW VELOCITY(FEET/SEC.) = 3.18 DEPTH*VELOCITY = 1.57

****

FLOW PROCESS FROM NODE 107.00 TO NODE 92.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

DEPTH OF FLOW IN 33.0 INCH PIPE IS 19.7 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 5.5
UPSTREAM NODE ELEVATION = 444.84
DOWNSTREAM NODE ELEVATION = 444.04
FLOWLENGTH(FEET) = 201.12 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 20.42
TRAVEL TIME(MIN.) = .61 TC(MIN.) = 20.98

****

FLOW PROCESS FROM NODE 92.00 TO NODE 92.10 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 20.98
RAINFALL INTENSITY(INCH/HR) = 1.82
TOTAL STREAM AREA(ACRES) = 13.40
PEAK FLOW RATE(CFS) AT CONFLUENCE = 20.42

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	18.05	10.04	2.792	12.37
2	20.42	20.98	1.820	13.40

*********************************WARNING*********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****

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

```
** PEAK FLOW RATE TABLE **
STREAM    RUNOFF    Tc     INTENSITY
NUMBER     (CFS)   (MIN.)  (INCH/HOUR)
   1      27.82   10.04     2.792
   2      32.19   20.98     1.820

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = .  32.19  Tc(MIN.) =  20.98
TOTAL AREA(ACRES) =    25.77

****************************************************************************
 FLOW PROCESS FROM NODE    92.10 TO NODE    93.00 IS CODE =  4
 ----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  22.2 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  6.2
 UPSTREAM NODE ELEVATION =  443.28
 DOWNSTREAM NODE ELEVATION =  442.42
 FLOWLENGTH(FEET) =  215.65   MANNING'S N =  .013
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =     32.19
 TRAVEL TIME(MIN.) =    .58    TC(MIN.) =  21.56

****************************************************************************
 FLOW PROCESS FROM NODE    70.00 TO NODE    71.00 IS CODE = 21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  660.00
 UPSTREAM ELEVATION =   467.10
 DOWNSTREAM ELEVATION =   457.36
 ELEVATION DIFFERENCE =      9.74
 TC = .359*[( 660.00**3)/(   9.74)]**.2 =  11.203
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.619
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7363
 SUBAREA RUNOFF(CFS) =      3.66
 TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =      3.66

****************************************************************************
 FLOW PROCESS FROM NODE    71.00 TO NODE    72.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =    457.36  DOWNSTREAM ELEVATION =    454.75
 STREET LENGTH(FEET) =  520.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  14.00
 INTERIOR STREET CROSSFALL(DECIMAL) =   .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =   .020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    4.95
   STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =   .43
     HALFSTREET FLOODWIDTH(FEET) =   15.16
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.05
     PRODUCT OF DEPTH&VELOCITY =     .88
 STREETFLOW TRAVELTIME(MIN) =   4.23   TC(MIN) =  15.44
```

```
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.175
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7218
SUBAREA AREA(ACRES) =   1.62  SUBAREA RUNOFF(CFS) =   2.54
SUMMED AREA(ACRES) =   3.52  TOTAL RUNOFF(CFS) =    6.21
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .46  HALFSTREET FLOODWIDTH(FEET) = 16.82
FLOW VELOCITY(FEET/SEC.) = 2.11  DEPTH*VELOCITY =   .97

****************************************************************************
 FLOW PROCESS FROM NODE   72.00 TO NODE   93.00 IS CODE =  4
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
============================================================================
 DEPTH OF FLOW IN 18.0 INCH PIPE IS  4.6 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) = 17.4
 UPSTREAM NODE ELEVATION =  450.88
 DOWNSTREAM NODE ELEVATION =  440.92
 FLOWLENGTH(FEET) =   50.19  MANNING'S N = .013
 GIVEN PIPE DIAMETER(INCH) = 18.00   NUMBER OF PIPES =  1
 PIPEFLOW THRU SUBAREA(CFS) =     6.21
 TRAVEL TIME(MIN.) =    .05   TC(MIN.) = 15.49

****************************************************************************
 FLOW PROCESS FROM NODE   73.00 TO NODE   74.00 IS CODE = 21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  980.00
 UPSTREAM ELEVATION =   467.30
 DOWNSTREAM ELEVATION =    459.08
 ELEVATION DIFFERENCE =      8.22
 TC = .393*[( 980.00**3)/(   8.22)]**.2 =  16.059
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.126
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6429
 SUBAREA RUNOFF(CFS) =     2.28
 TOTAL AREA(ACRES) =     1.67  TOTAL RUNOFF(CFS) =     2.28

****************************************************************************
 FLOW PROCESS FROM NODE   74.00 TO NODE   75.00 IS CODE =  6
----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =   459.08  DOWNSTREAM ELEVATION =   454.75
 STREET LENGTH(FEET) =  782.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 28.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 14.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    3.81
   STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =  .40
     HALFSTREET FLOODWIDTH(FEET) =  13.51
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.96
     PRODUCT OF DEPTH&VELOCITY =    .78
 STREETFLOW TRAVELTIME(MIN) =   6.65  TC(MIN) =  22.71

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.739
```

SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6211
SUBAREA AREA(ACRES) = 2.83 SUBAREA RUNOFF(CFS) = 3.06
SUMMED AREA(ACRES) = 4.50 TOTAL RUNOFF(CFS) = 5.34
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .43 HALFSTREET FLOODWIDTH(FEET) = 15.16
FLOW VELOCITY(FEET/SEC.) = 2.21 DEPTH*VELOCITY = .95

****

FLOW PROCESS FROM NODE 75.00 TO NODE 93.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

==

DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.4 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 15.9
UPSTREAM NODE ELEVATION = 450.97
DOWNSTREAM NODE ELEVATION = 442.07
FLOWLENGTH(FEET) = 50.40 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 5.34
TRAVEL TIME(MIN.) = .05 TC(MIN.) = 22.76

End Drainage Area "D"

Begin Drainage Area "E"

****

FLOW PROCESS FROM NODE 131.00 TO NODE 131.10 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

==

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS APARTMENT
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 800.00
UPSTREAM ELEVATION = 464.80
DOWNSTREAM ELEVATION = 456.37
ELEVATION DIFFERENCE = 8.43
TC = .323*[(800.00**3)/(8.43)]**.2 = 11.628
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.563
SOIL CLASSIFICATION IS "A"
APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8055
SUBAREA RUNOFF(CFS) = 14.31
TOTAL AREA(ACRES) = 6.93 TOTAL RUNOFF(CFS) = 14.31

****

FLOW PROCESS FROM NODE 131.10 TO NODE 132.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

==

UPSTREAM ELEVATION = 456.37 DOWNSTREAM ELEVATION = 450.70
STREET LENGTH(FEET) = 724.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 21.23
STREET FLOWING FULL
STREETFLOW MODEL RESULTS:
NOTE: STREETFLOW EXCEEDS TOP OF CURB.

```
================================================================================
PIPEFLOW VELOCITY(FEET/SEC.) =  5.3
UPSTREAM NODE ELEVATION =  430.87
DOWNSTREAM NODE ELEVATION =  430.64
FLOWLENGTH(FEET) =   58.74  MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 18.00   NUMBER OF PIPES =  1
PIPEFLOW THRU SUBAREA(CFS) =     9.38
TRAVEL TIME(MIN.) =   .18   TC(MIN.) = 20.00
```

End Drainage Area "G"

Begin Drainage Area "H1"

```
****************************************************************************
FLOW PROCESS FROM NODE   240.00 TO NODE   245.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
    ASSUMED INITIAL SUBAREA UNIFORM
    DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH =  640.00
UPSTREAM ELEVATION =   464.00
DOWNSTREAM ELEVATION =   457.61
ELEVATION DIFFERENCE =     6.39
TC =  .393*[( 640.00**3)/(    6.39)]**.2 =  13.078
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.394
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6561
SUBAREA RUNOFF(CFS) =      3.06
TOTAL AREA(ACRES) =      1.95  TOTAL RUNOFF(CFS) =      3.06

****************************************************************************
FLOW PROCESS FROM NODE   245.00 TO NODE   250.00 IS CODE =  6
----------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
================================================================================
UPSTREAM ELEVATION =   457.61  DOWNSTREAM ELEVATION =   451.60
STREET LENGTH(FEET) =  814.00  CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) =  .020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =    6.91
  STREETFLOW MODEL RESULTS:
    STREET FLOWDEPTH(FEET) =  .39
    HALFSTREET FLOODWIDTH(FEET) =  12.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.02
    PRODUCT OF DEPTH&VELOCITY =     .79
STREETFLOW TRAVELTIME(MIN) =  6.72   TC(MIN) =  19.80

 10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.883
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6296
SUBAREA AREA(ACRES) =    6.28  SUBAREA RUNOFF(CFS) =   7.44
SUMMED AREA(ACRES) =    8.23  TOTAL RUNOFF(CFS) =     10.51
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) =  .43   HALFSTREET FLOODWIDTH(FEET) = 14.50
FLOW VELOCITY(FEET/SEC.) =  2.33  DEPTH*VELOCITY =   1.01


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

FLOW PROCESS FROM NODE 250.00 TO NODE 250.10 IS CODE = 7

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

===

USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) = 19.80 RAIN INTENSITY(INCH/HOUR) = 1.88
TOTAL AREA(ACRES) = 4.12 TOTAL RUNOFF(CFS) = 5.26

****

FLOW PROCESS FROM NODE 250.10 TO NODE 275.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

===

UPSTREAM ELEVATION = 451.60 DOWNSTREAM ELEVATION = 446.89
STREET LENGTH(FEET) = 690.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 7.55
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .39
HALFSTREET FLOODWIDTH(FEET) = 12.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.20
PRODUCT OF DEPTH&VELOCITY = .87
STREETFLOW TRAVELTIME(MIN) = 5.22 TC(MIN) = 25.02

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.644
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6152
SUBAREA AREA(ACRES) = 4.57 SUBAREA RUNOFF(CFS) = 4.62
SUMMED AREA(ACRES) = 8.69 TOTAL RUNOFF(CFS) = 9.88
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .43 HALFSTREET FLOODWIDTH(FEET) = 14.50
FLOW VELOCITY(FEET/SEC.) = 2.19 DEPTH*VELOCITY = .95

****

FLOW PROCESS FROM NODE 275.00 TO NODE 265.00 IS CODE = 4

>>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE<<<<<

===

DEPTH OF FLOW IN 24.0 INCH PIPE IS 8.2 INCHES
PIPEFLOW VELOCITY(FEET/SEC.) = 10.5
UPSTREAM NODE ELEVATION = 438.57
DOWNSTREAM NODE ELEVATION = 435.57
FLOWLENGTH(FEET) = 82.83 MANNING'S N = .013
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPEFLOW THRU SUBAREA(CFS) = 9.88
TRAVEL TIME(MIN.) = .13 TC(MIN.) = 25.15

End Drainage Area "H1"

Begin Drainage Area "H2"

□

FLOW PROCESS FROM NODE 250.00 TO NODE 250.00 IS CODE =

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

===

USER-SPECIFIED VALUES ARE AS FOLLOWS:

TC(MIN) = 19.80 RAIN INTENSITY(INCH/HOUR) = 1.88
TOTAL AREA(ACRES) = 4.12 TOTAL RUNOFF(CFS) = 5.26

****

FLOW PROCESS FROM NODE 250.00 TO NODE 251.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

===

UPSTREAM ELEVATION = 451.60 DOWNSTREAM ELEVATION = 449.76
STREET LENGTH(FEET) = 235.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 12.57
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .45
HALFSTREET FLOODWIDTH(FEET) = 15.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.46
PRODUCT OF DEPTH&VELOCITY = 1.12
STREETFLOW TRAVELTIME(MIN) = 1.59 TC(MIN) = 21.39

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.800
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7074
SUBAREA AREA(ACRES) = 11.49 SUBAREA RUNOFF(CFS) = 14.63
SUMMED AREA(ACRES) = 15.61 TOTAL RUNOFF(CFS) = 19.89
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .51 HALFSTREET FLOODWIDTH(FEET) = 18.00 ⟹
FLOW VELOCITY(FEET/SEC.) = 2.79 DEPTH*VELOCITY = 1.43

SEE FIGURE 4
S=0.00783
STREET CAPACITY = 27.91 CFS
OK

****

FLOW PROCESS FROM NODE 251.00 TO NODE 252.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

===

UPSTREAM ELEVATION = 449.76 DOWNSTREAM ELEVATION = 447.80
STREET LENGTH(FEET) = 220.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 24.44
STREET FLOWING FULL
STREETFLOW MODEL RESULTS:
NOTE: STREETFLOW EXCEEDS TOP OF CURB.
THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
STREET FLOWDEPTH(FEET) = .53
HALFSTREET FLOODWIDTH(FEET) = 18.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.12
PRODUCT OF DEPTH&VELOCITY = 1.66
STREETFLOW TRAVELTIME(MIN) = 1.18 TC(MIN) = 22.56

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.745
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7051
SUBAREA AREA(ACRES) = 7.40 SUBAREA RUNOFF(CFS) = 9.11
SUMMED AREA(ACRES) = 23.01 TOTAL RUNOFF(CFS) = 28.99

END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .55 HALFSTREET FLOODWIDTH(FEET) = 18.00
FLOW VELOCITY(FEET/SEC.) = 3.40 DEPTH*VELOCITY = 1.88

SEE FIGURE 4
S=0.00891
STREET CAPACITY = 29.77 CFS
OK

==
END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 28.99 Tc(MIN.) = 22.56
TOTAL AREA(ACRES) = 23.01
==
END OF RATIONAL METHOD ANALYSIS

End Drainage Area "H2"

Begin Drainage Area "H4"

****
FLOW PROCESS FROM NODE 210.00 TO NODE 215.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==
ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 1090.00
UPSTREAM ELEVATION = 470.00
DOWNSTREAM ELEVATION = 461.72
ELEVATION DIFFERENCE = 8.28
TC = .393*[(1090.00**3)/(8.28)]**.2 = 17.092
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.050
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6389
SUBAREA RUNOFF(CFS) = 4.78
TOTAL AREA(ACRES) = 3.65 TOTAL RUNOFF(CFS) = 4.78

****
FLOW PROCESS FROM NODE 215.00 TO NODE 225.00 IS CODE = 6

>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==
UPSTREAM ELEVATION = 461.72 DOWNSTREAM ELEVATION = 455.04
STREET LENGTH(FEET) = 708.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 8.63
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .39
HALFSTREET FLOODWIDTH(FEET) = 12.50
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.52
PRODUCT OF DEPTH&VELOCITY = .99
STREETFLOW TRAVELTIME(MIN) = 4.68 TC(MIN) = 21.77

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.782
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6237
SUBAREA AREA(ACRES) = 6.85 SUBAREA RUNOFF(CFS) = 7.61
SUMMED AREA(ACRES) = 10.50 TOTAL RUNOFF(CFS) = 12.39
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .43 HALFSTREET FLOODWIDTH(FEET) = 14.50
FLOW VELOCITY(FEET/SEC.) = 2.75 DEPTH*VELOCITY = 1.19

```
****************************************************************************
 FLOW PROCESS FROM NODE   225.00 TO NODE   225.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) = 21.77
 RAINFALL INTENSITY(INCH/HR) =  1.78
 TOTAL STREAM AREA(ACRES) =  10.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.39

****************************************************************************
 FLOW PROCESS FROM NODE   220.00 TO NODE   221.00 IS CODE = 21
 ----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  750.00
 UPSTREAM ELEVATION =   469.00
 DOWNSTREAM ELEVATION =   459.50
 ELEVATION DIFFERENCE =      9.50
 TC = .393*[( 750.00**3)/(    9.50)]**.2 =  13.287
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.373
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6551
 SUBAREA RUNOFF(CFS) =    10.43
 TOTAL AREA(ACRES) =     6.71  TOTAL RUNOFF(CFS) =     10.43

****************************************************************************
 FLOW PROCESS FROM NODE   221.00 TO NODE   225.00 IS CODE =  6
 ----------------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 UPSTREAM ELEVATION =   459.50  DOWNSTREAM ELEVATION =   455.04
 STREET LENGTH(FEET) =  610.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  11.39
   STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =  .43
     HALFSTREET FLOODWIDTH(FEET) =  14.50
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.53
     PRODUCT OF DEPTH&VELOCITY =   1.10
 STREETFLOW TRAVELTIME(MIN) =   4.02  TC(MIN) =  17.31

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.035
 SOIL CLASSIFICATION IS "A"
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6381
 SUBAREA AREA(ACRES) =   1.47   SUBAREA RUNOFF(CFS) =    1.91
 SUMMED AREA(ACRES) =    8.18  TOTAL RUNOFF(CFS) =     12.34
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) = .45   HALFSTREET FLOODWIDTH(FEET) = 15.50
 FLOW VELOCITY(FEET/SEC.) = 2.42   DEPTH*VELOCITY =   1.10

****************************************************************************
 FLOW PROCESS FROM NODE   225.00 TO NODE   225.10 IS CODE =  1
 ----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 17.31
RAINFALL INTENSITY(INCH/HR) = 2.04
TOTAL STREAM AREA(ACRES) = 8.18
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.34

** CONFLUENCE DATA **
STREAM   RUNOFF   Tc     INTENSITY    AREA
NUMBER    (CFS)  (MIN.)  (INCH/HOUR)  (ACRE)
  1      12.39   21.77    1.782       10.50
  2      12.34   17.31    2.035        8.18

*********************************WARNING**********************************
IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**************************************************************************

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

** PEAK FLOW RATE TABLE **
STREAM   RUNOFF   Tc     INTENSITY
NUMBER    (CFS)  (MIN.)  (INCH/HOUR)
  1      22.19   17.31    2.035
  2      23.19   21.77    1.782

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    23.19  Tc(MIN.) =  21.77
TOTAL AREA(ACRES) =    18.68


**************************************************************************
FLOW PROCESS FROM NODE  225.10 TO NODE  200.00 IS CODE =  6
--------------------------------------------------------------------------
>>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
UPSTREAM ELEVATION =   455.04  DOWNSTREAM ELEVATION =   453.60
STREET LENGTH(FEET) =  210.00  CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 16.00
INTERIOR STREET CROSSFALL(DECIMAL) =  .020
OUTSIDE STREET CROSSFALL(DECIMAL) =  .055

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

    **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  26.31
***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS:
    NOTE: STREETFLOW EXCEEDS TOP OF CURB.
    THE FOLLOWING STREETFLOW RESULTS ARE BASED ON THE ASSUMPTION
    THAT NEGLIBLE FLOW OCCURS OUTSIDE OF THE STREET CHANNEL.
    THAT IS, ALL FLOW ALONG THE PARKWAY, ETC., IS NEGLECTED.
    STREET FLOWDEPTH(FEET) =  .55
    HALFSTREET FLOODWIDTH(FEET) =  18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.08
    PRODUCT OF DEPTH&VELOCITY =   1.70
STREETFLOW TRAVELTIME(MIN) =  1.14  TC(MIN) = 22.91

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.730
SOIL CLASSIFICATION IS "A"
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6206
SUBAREA AREA(ACRES) =   5.81  SUBAREA RUNOFF(CFS) =   6.24
SUMMED AREA(ACRES) =  24.49  TOTAL RUNOFF(CFS) =   29.43
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .57  HALFSTREET FLOODWIDTH(FEET) = 18.00
```

⟹ THIS PORTION IS NOT WITHIN TRACT 28639-1 IMPROVEMENTS

FLOW VELOCITY(FEET/SEC.) = 3.19 DEPTH*VELOCITY = 1.82

End Drainage Area "H4"

Begin Drainage Area "I"

```
****************************************************************************
 FLOW PROCESS FROM NODE   315.00 TO NODE   320.00 IS CODE = 21
--------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
     ASSUMED INITIAL SUBAREA UNIFORM
     DEVELOPMENT IS CONDOMINIUM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH =  840.00
 UPSTREAM ELEVATION =   453.10
 DOWNSTREAM ELEVATION =   445.18
 ELEVATION DIFFERENCE =    7.92
 TC = .359*[( 840.00**3)/(   7.92)]**.2 =  13.495
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.351
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7279
 SUBAREA RUNOFF(CFS) =    9.50
 TOTAL AREA(ACRES) =    5.55   TOTAL RUNOFF(CFS) =    9.50


****************************************************************************
 FLOW PROCESS FROM NODE   320.00 TO NODE   325.00 IS CODE =  6
--------------------------------------------------------------------
 >>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 UPSTREAM ELEVATION =   445.18   DOWNSTREAM ELEVATION =   442.57
 STREET LENGTH(FEET) =  238.00   CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK =  16.00
 INTERIOR STREET CROSSFALL(DECIMAL) =  .020
 OUTSIDE STREET CROSSFALL(DECIMAL) =  .055

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2

     **TRAVELTIME COMPUTED USING MEAN FLOW(CFS) =  11.63
   STREETFLOW MODEL RESULTS:
     STREET FLOWDEPTH(FEET) =  .41
     HALFSTREET FLOODWIDTH(FEET) =  13.50
     AVERAGE FLOW VELOCITY(FEET/SEC.) =  2.95
     PRODUCT OF DEPTH&VELOCITY =   1.22
 STREETFLOW TRAVELTIME(MIN) =  1.34   TC(MIN) =  14.84

  10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.225
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7236
 SUBAREA AREA(ACRES) =    2.65   SUBAREA RUNOFF(CFS) =    4.27
 SUMMED AREA(ACRES) =    8.20   TOTAL RUNOFF(CFS) =    13.77
 END OF SUBAREA STREETFLOW HYDRAULICS:
 DEPTH(FEET) = .43   HALFSTREET FLOODWIDTH(FEET) = 14.50
 FLOW VELOCITY(FEET/SEC.) = 3.06   DEPTH*VELOCITY =   1.33


****************************************************************************
 FLOW PROCESS FROM NODE   325.00 TO NODE   326.00 IS CODE =  4
--------------------------------------------------------------------
 >>>>>COMPUTE PIPEFLOW TRAVELTIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE<<<<<
==========================================================================
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   7.2 INCHES
 PIPEFLOW VELOCITY(FEET/SEC.) =  17.5
```

Unit Hydrograph Analyses

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

          U N I T - H Y D R O G R A P H   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
                      (RCFC&WCD) 1978 HYDROLOGY MANUAL

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                      Especially prepared for:

                   MAINIERO, SMITH AND ASSOCIATES

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>


**********DESCRIPTION OF RESULTS********************************************
* Rio Vista Village                                                        *
* Area B                                                                   *
* 100 Year, 24 Hour Storm                                                  *
****************************************************************************

****************************************************************************
         WATERCOURSE LENGTH =     2095.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    1145.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =      16.150 FEET
         MANNINGS FRICTION FACTOR ALONG WATERCOURSE =  .015
         WATERSHED AREA =      22.260 ACRES
         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         DESERT S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =    .325
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) =  .900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =    .160
         BASEFLOW =    .000 CFS/SQUARE-MILE
         USER-ENTERED RAINFALL =  4.50 INCHES
         PROGRAM NUMBER  9 SELECTED


         WATERCOURSE "LAG" TIME =      .070 HOURS
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 356.674
         HYDROGRAPH BASEFLOW =      .000 CFS
         RCFC&WCD AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000



<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

                 Advanced Engineering Software [AES]
                          SERIAL No.I06181
                 VER. 1.6C     RELEASE DATE: 2/21/86

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

****************************************************************************
                      UNIT HYDROGRAPH DETERMINATION
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	61.581	55.260
2	96.909	31.702
3	99.901	2.685
4	100.000	.089

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****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	.0090	.0081	.0009
2	.0135	.0121	.0013
3	.0135	.0121	.0013
4	.0180	.0162	.0018
5	.0135	.0121	.0013
6	.0135	.0121	.0013
7	.0135	.0121	.0013
8	.0180	.0162	.0018
9	.0180	.0162	.0018
10	.0180	.0162	.0018
11	.0225	.0202	.0022
12	.0225	.0202	.0022
13	.0225	.0202	.0022
14	.0225	.0202	.0022
15	.0225	.0202	.0022
16	.0270	.0243	.0027
17	.0270	.0243	.0027
18	.0315	.0283	.0031
19	.0315	.0283	.0031
20	.0360	.0324	.0036
21	.0270	.0243	.0027
22	.0315	.0283	.0031
23	.0360	.0324	.0036
24	.0360	.0324	.0036
25	.0405	.0364	.0040
26	.0405	.0364	.0040
27	.0450	.0405	.0045
28	.0450	.0405	.0045
29	.0450	.0405	.0045
30	.0495	.0445	.0049
31	.0540	.0486	.0054
32	.0585	.0526	.0058
33	.0675	.0607	.0067
34	.0675	.0607	.0067
35	.0720	.0648	.0072
36	.0765	.0688	.0076
37	.0855	.0769	.0085
38	.0900	.0810	.0090
39	.0945	.0850	.0094
40	.0990	.0863	.0127
41	.0675	.0607	.0067
42	.0675	.0607	.0067
43	.0900	.0810	.0090
44	.0900	.0810	.0090
45	.0855	.0769	.0085
46	.0855	.0769	.0085
47	.0765	.0688	.0076
48	.0810	.0729	.0081
49	.1125	.0754	.0371
50	.1170	.0742	.0428
51	.1260	.0731	.0529
52	.1305	.0720	.0585
53	.1530	.0709	.0821
54	.1530	.0698	.0832
55	.1035	.0687	.0348
56	.1035	.0676	.0359
57	.1215	.0666	.0549
58	.1170	.0655	.0515
59	.1170	.0645	.0525
60	.1125	.0635	.0490
61	.1080	.0625	.0455
62	.1035	.0616	.0419
63	.0855	.0606	.0249
64	.0855	.0596	.0259
65	.0180	.0162	.0018

66	.0180	.0162	.0018
67	.0135	.0121	.0013
68	.0135	.0121	.0013
69	.0225	.0202	.0022
70	.0225	.0202	.0022
71	.0225	.0202	.0022
72	.0180	.0162	.0018
73	.0180	.0162	.0018
74	.0180	.0162	.0018
75	.0135	.0121	.0013
76	.0090	.0081	.0009
77	.0135	.0121	.0013
78	.0180	.0162	.0018
79	.0135	.0121	.0013
80	.0090	.0081	.0009
81	.0135	.0121	.0013
82	.0135	.0121	.0013
83	.0135	.0121	.0013
84	.0090	.0081	.0009
85	.0135	.0121	.0013
86	.0090	.0081	.0009
87	.0135	.0121	.0013
88	.0090	.0081	.0009
89	.0135	.0121	.0013
90	.0090	.0081	.0009
91	.0090	.0081	.0009
92	.0090	.0081	.0009
93	.0090	.0081	.0009
94	.0090	.0081	.0009
95	.0090	.0081	.0009
96	.0090	.0081	.0009

TOTAL STORM RAINFALL(INCHES) = 4.50
TOTAL SOIL-LOSS(INCHES) = 3.46
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.04

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 6.4158
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.9303

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

        RCFC&WCD 24-HOUR RUNOFF HYDROGRAPH

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

        HYDROGRAPH IN FIFTEEN-MINUTE INTERVALS(CFS)

--------------------------------------------------------------------------
INTERVAL# VOLUME(AF)   Q(CFS) 0.        2.5       5.0       7.5      10.0
--------------------------------------------------------------------------
    1       .0010       .05  Q         .         .         .         .
    2       .0032       .10  Q         .         .         .         .
    3       .0056       .12  Q         .         .         .         .
    4       .0086       .15  Q         .         .         .         .
    5       .0114       .14  Q         .         .         .         .
    6       .0140       .12  Q         .         .         .         .
    7       .0165       .12  Q         .         .         .         .
    8       .0195       .15  Q         .         .         .         .
    9       .0228       .16  Q         .         .         .         .
   10       .0261       .16  Q         .         .         .         .
   11       .0300       .19  Q         .         .         .         .
   12       .0341       .20  Q         .         .         .         .
   13       .0383       .20  Q         .         .         .         .
   14       .0425       .20  Q         .         .         .         .
   15       .0467       .20  Q         .         .         .         .
   16       .0513       .23  QV        .         .         .         .
   17       .0563       .24  QV        .         .         .         .
   18       .0618       .27  .Q        .         .         .         .
   19       .0677       .28  .Q        .         .         .         .
   20       .0740       .31  .Q        .         .         .         .
   21       .0796       .27  .Q        .         .         .         .
   22       .0852       .27  .Q        .         .         .         .
   23       .0915       .31  .Q        .         .         .         .
   24       .0982       .32  .QV       .         .         .         .
   25       .1054       .35  .QV       .         .         .         .
   26       .1128       .36  .QV       .         .         .         .
   27       .1209       .39  .QV       .         .         .         .
   28       .1292       .40  .QV       .         .         .         .
   29       .1375       .40  .QV       .         .         .         .
   30       .1464       .43  .Q V      .         .         .         .
   31       .1560       .47  .Q V      .         .         .         .
   32       .1665       .51  . QV      .         .         .         .
   33       .1784       .57  . QV      .         .         .         .
   34       .1909       .60  . QV      .         .         .         .
   35       .2039       .63  . Q V     .         .         .         .
   36       .2177       .67  . Q V     .         .         .         .
   37       .2329       .73  . Q V     .         .         .         .
   38       .2492       .79  .  Q V    .         .         .         .
   39       .2664       .83  .  Q V    .         .         .         .
   40       .2876      1.03  .    QV   .         .         .         .
   41       .3042       .80  .  Q  V   .         .         .         .
   42       .3170       .62  . Q   V   .         .         .         .
   43       .3321       .73  . Q   V   .         .         .         .
   44       .3487       .80  .  Q   V  .         .         .         .
   45       .3648       .78  .  Q   V  .         .         .         .
   46       .3807       .77  .  Q   V  .         .         .         .
   47       .3955       .72  . Q     V .         .         .         .
   48       .4103       .71  . Q     V .         .         .         .
   49       .4584      2.33  .        Q.         .         .         .
   50       .5320      3.56  .         .V  Q     .         .         .
   51       .6225      4.38  .         . V    Q  .         .         .
   52       .7264      5.03  .         .    V    Q         .         .
   53       .8615      6.54  .         .      V  .     Q   .         .
   54      1.0137      7.36  .         .         .V       Q.         .
   55      1.1126      4.79  .         .        Q.  V      .         .
   56      1.1811      3.32  .         .  Q      .   V     .         .
   57      1.2693      4.27  .         .      Q  .     V   .         .
   58      1.3661      4.68  .         .       Q .       V .         .
   59      1.4628      4.68  .         .       Q .         V         .
```

```
60      1.5561    4.51  .         .       Q .         . V       .
61      1.6431    4.21  .         .     Q   .         .   V     .
62      1.7236    3.90  .         .    Q    .         .    V    .
63      1.7821    2.83  .         .Q        .         .     V   .
64      1.8303    2.33  .        Q.         .         .      V  .
65      1.8508     .99  .  Q      .         .         .       V .
66      1.8555     .23  Q         .         .         .       V .
67      1.8584     .14  Q         .         .         .       V .
68      1.8609     .12  Q         .         .         .       V .
69      1.8644     .17  Q         .         .         .       V .
70      1.8685     .20  Q         .         .         .       V .
71      1.8727     .20  Q         .         .         .       V .
72      1.8764     .18  Q         .         .         .       V .
73      1.8797     .16  Q         .         .         .       V .
74      1.8831     .16  Q         .         .         .        V.
75      1.8859     .14  Q         .         .         .        V.
76      1.8879     .10  Q         .         .         .        V.
77      1.8901     .11  Q         .         .         .        V.
78      1.8931     .14  Q         .         .         .        V.
79      1.8959     .14  Q         .         .         .        V.
80      1.8979     .10  Q         .         .         .        V.
81      1.9001     .11  Q         .         .         .        V.
82      1.9026     .12  Q         .         .         .        V.
83      1.9051     .12  Q         .         .         .        V.
84      1.9071     .10  Q         .         .         .        V.
85      1.9093     .11  Q         .         .         .        V.
86      1.9113     .10  Q         .         .         .        V.
87      1.9135     .11  Q         .         .         .        V.
88      1.9154     .10  Q         .         .         .        V.
89      1.9176     .11  Q         .         .         .        V.
90      1.9196     .10  Q         .         .         .        V.
91      1.9213     .08  Q         .         .         .        V.
92      1.9230     .08  Q         .         .         .        V.
93      1.9246     .08  Q         .         .         .        V.
94      1.9263     .08  Q         .         .         .        V.
95      1.9280     .08  Q         .         .         .        V.
96      1.9296     .08  Q         .         .         .        V.
97      1.9303     .03  Q         .         .         .        V.
98      1.9303     .00  Q         .         .         .        V.
99      1.9303     .00  Q         .         .         .        V.
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U N I T - H Y D R O G R A P H   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL

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(C) Copyright 1982,1986 Advanced Engineering Software [AES]

Especially prepared for:

MAINIERO, SMITH AND ASSOCIATES

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

**********DESCRIPTION OF RESULTS**
* Rio Vista Village *
* Area C *
* 100 Year, 24 Hour Storm *
****

****
WATERCOURSE LENGTH = 1055.000 FEET
LENGTH FROM CONCENTRATION POINT TO CENTROID = 565.000 FEET
ELEVATION VARIATION ALONG WATERCOURSE = 13.400 FEET
MANNINGS FRICTION FACTOR ALONG WATERCOURSE = .015
WATERSHED AREA = 10.000 ACRES
UNIT HYDROGRAPH TIME UNIT = 15.000 MINUTES
DESERT S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = .350
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = .900
MINIMUM SOIL-LOSS RATE(INCH/HOUR) = .175
BASEFLOW = .000 CFS/SQUARE-MILE
USER-ENTERED RAINFALL = 4.50 INCHES
PROGRAM NUMBER 9 SELECTED

WATERCOURSE "LAG" TIME = .038 HOURS
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 665.667
HYDROGRAPH BASEFLOW = .000 CFS
RCFC&WCD AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000

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Advanced Engineering Software [AES]
SERIAL No.I06181
VER. 1.6C RELEASE DATE: 2/21/86

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****
UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	77.804	31.365
2	99.897	8.906
3	100.000	.041

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****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	.0090	.0081	.0009
2	.0135	.0121	.0013
3	.0135	.0121	.0013
4	.0180	.0162	.0018
5	.0135	.0121	.0013
6	.0135	.0121	.0013
7	.0135	.0121	.0013
8	.0180	.0162	.0018
9	.0180	.0162	.0018
10	.0180	.0162	.0018
11	.0225	.0202	.0022
12	.0225	.0202	.0022
13	.0225	.0202	.0022
14	.0225	.0202	.0022
15	.0225	.0202	.0022
16	.0270	.0243	.0027
17	.0270	.0243	.0027
18	.0315	.0283	.0031
19	.0315	.0283	.0031
20	.0360	.0324	.0036
21	.0270	.0243	.0027
22	.0315	.0283	.0031
23	.0360	.0324	.0036
24	.0360	.0324	.0036
25	.0405	.0364	.0040
26	.0405	.0364	.0040
27	.0450	.0405	.0045
28	.0450	.0405	.0045
29	.0450	.0405	.0045
30	.0495	.0445	.0049
31	.0540	.0486	.0054
32	.0585	.0526	.0058
33	.0675	.0607	.0067
34	.0675	.0607	.0067
35	.0720	.0648	.0072
36	.0765	.0688	.0076
37	.0855	.0769	.0085
38	.0900	.0810	.0090
39	.0945	.0850	.0094
40	.0990	.0891	.0099
41	.0675	.0607	.0067
42	.0675	.0607	.0067
43	.0900	.0810	.0090
44	.0900	.0810	.0090
45	.0855	.0769	.0085
46	.0855	.0769	.0085
47	.0765	.0688	.0076
48	.0810	.0729	.0081
49	.1125	.0813	.0312
50	.1170	.0801	.0369
51	.1260	.0789	.0471
52	.1305	.0777	.0528
53	.1530	.0765	.0765
54	.1530	.0753	.0777
55	.1035	.0742	.0293
56	.1035	.0731	.0304
57	.1215	.0719	.0496
58	.1170	.0708	.0462
59	.1170	.0698	.0472
60	.1125	.0687	.0438
61	.1080	.0676	.0404
62	.1035	.0666	.0369
63	.0855	.0656	.0199
64	.0855	.0646	.0209
65	.0180	.0162	.0018

66	.0180	.0162	.0018
67	.0135	.0121	.0013
68	.0135	.0121	.0013
69	.0225	.0202	.0022
70	.0225	.0202	.0022
71	.0225	.0202	.0022
72	.0180	.0162	.0018
73	.0180	.0162	.0018
74	.0180	.0162	.0018
75	.0135	.0121	.0013
76	.0090	.0081	.0009
77	.0135	.0121	.0013
78	.0180	.0162	.0018
79	.0135	.0121	.0013
80	.0090	.0081	.0009
81	.0135	.0121	.0013
82	.0135	.0121	.0013
83	.0135	.0121	.0013
84	.0090	.0081	.0009
85	.0135	.0121	.0013
86	.0090	.0081	.0009
87	.0135	.0121	.0013
88	.0090	.0081	.0009
89	.0135	.0121	.0013
90	.0090	.0081	.0009
91	.0090	.0081	.0009
92	.0090	.0081	.0009
93	.0090	.0081	.0009
94	.0090	.0081	.0009
95	.0090	.0081	.0009
96	.0090	.0081	.0009

TOTAL STORM RAINFALL(INCHES) = 4.50
TOTAL SOIL-LOSS(INCHES) = 3.55
TOTAL EFFECTIVE RAINFALL(INCHES) = .95

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.9566
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = .7929

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         RCFC&WCD 24-HOUR RUNOFF HYDROGRAPH

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

         HYDROGRAPH IN FIFTEEN-MINUTE INTERVALS(CFS)

----------------------------------------------------------------------------
INTERVAL# VOLUME(AF)   Q(CFS) 0.        2.5       5.0       7.5      10.0
----------------------------------------------------------------------------
      1       .0006        .03 Q         .         .         .         .
      2       .0016        .05 Q         .         .         .         .
      3       .0027        .05 Q         .         .         .         .
      4       .0042        .07 Q         .         .         .         .
      5       .0054        .06 Q         .         .         .         .
      6       .0065        .05 Q         .         .         .         .
      7       .0076        .05 Q         .         .         .         .
      8       .0090        .07 Q         .         .         .         .
      9       .0105        .07 Q         .         .         .         .
     10       .0120        .07 Q         .         .         .         .
     11       .0138        .09 Q         .         .         .         .
     12       .0157        .09 Q         .         .         .         .
     13       .0176        .09 Q         .         .         .         .
     14       .0194        .09 Q         .         .         .         .
     15       .0213        .09 QV        .         .         .         .
     16       .0235        .10 QV        .         .         .         .
     17       .0257        .11 QV        .         .         .         .
     18       .0283        .12 QV        .         .         .         .
     19       .0309        .13 QV        .         .         .         .
     20       .0338        .14 QV        .         .         .         .
     21       .0362        .12 QV        .         .         .         .
     22       .0388        .12 QV        .         .         .         .
     23       .0417        .14 Q V       .         .         .         .
     24       .0447        .15 Q V       .         .         .         .
     25       .0480        .16 Q V       .         .         .         .
     26       .0513        .16 Q V       .         .         .         .
     27       .0550        .18 Q V       .         .         .         .
     28       .0588        .18 Q V       .         .         .         .
     29       .0625        .18 Q  V      .         .         .         .
     30       .0665        .20 Q  V      .         .         .         .
     31       .0710        .21 Q  V      .         .         .         .
     32       .0757        .23 Q  V      .         .         .         .
     33       .0812        .26 .Q  V     .         .         .         .
     34       .0868        .27 .Q  V     .         .         .         .
     35       .0927        .29 .Q  V     .         .         .         .
     36       .0990        .30 .Q  V     .         .         .         .
     37       .1060        .34 .Q   V    .         .         .         .
     38       .1134        .36 .Q   V    .         .         .         .
     39       .1212        .38 .Q    V   .         .         .         .
     40       .1293        .40 .Q    V   .         .         .         .
     41       .1355        .30 .Q    V   .         .         .         .
     42       .1412        .27 .Q     V  .         .         .         .
     43       .1483        .34 .Q     V  .         .         .         .
     44       .1557        .36 .Q     V  .         .         .         .
     45       .1629        .35 .Q      V .         .         .         .
     46       .1701        .34 .Q      V .         .         .         .
     47       .1766        .32 .Q      V .         .         .         .
     48       .1833        .32 .Q       V.         .         .         .
     49       .2050       1.05 .   Q     V         .         .         .
     50       .2347       1.44 .    Q    .V        .         .         .
     51       .2721       1.81 .      Q  .  V      .         .         .
     52       .3150       2.08 .       Q .    V    .         .         .
     53       .3744       2.87 .         .Q      V .         .         .
     54       .4388       3.12 .         . Q       . V       .         .
     55       .4722       1.61 .     Q   .         .  V      .         .
     56       .4974       1.22 .   Q     .         .    V    .         .
     57       .5351       1.83 .      Q  .         .     V   .         .
     58       .5742       1.89 .      Q  .         .       V .         .
     59       .6133       1.89 .      Q  .         .         V         .
```

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     60         .6504       1.80  .        Q   .          .         . V       .
     61         .6847       1.66  .       Q    .          .         .   V     .
     62         .7161       1.52  .       Q    .          .         .     V   .
     63         .7358        .95  .  Q         .          .         .      V  .
     64         .7530        .83  .  Q         .          .         .      V  .
     65         .7581        .24  Q            .          .         .       V .
     66         .7596        .07  Q            .          .         .       V .
     67         .7608        .06  Q            .          .         .       V .
     68         .7619        .05  Q            .          .         .       V .
     69         .7636        .08  Q            .          .         .       V .
     70         .7655        .09  Q            .          .         .       V .
     71         .7674        .09  Q            .          .         .       V .
     72         .7689        .08  Q            .          .         .       V .
     73         .7704        .07  Q            .          .         .       V .
     74         .7719        .07  Q            .          .         .       V .
     75         .7732        .06  Q            .          .         .        V.
     76         .7740        .04  Q            .          .         .        V.
     77         .7750        .05  Q            .          .         .        V.
     78         .7764        .07  Q            .          .         .        V.
     79         .7776        .06  Q            .          .         .        V.
     80         .7785        .04  Q            .          .         .        V.
     81         .7795        .05  Q            .          .         .        V.
     82         .7806        .05  Q            .          .         .        V.
     83         .7818        .05  Q            .          .         .        V.
     84         .7826        .04  Q            .          .         .        V.
     85         .7836        .05  Q            .          .         .        V.
     86         .7845        .04  Q            .          .         .        V.
     87         .7855        .05  Q            .          .         .        V.
     88         .7864        .04  Q            .          .         .        V.
     89         .7874        .05  Q            .          .         .        V.
     90         .7882        .04  Q            .          .         .        V.
     91         .7890        .04  Q            .          .         .        V.
     92         .7897        .04  Q            .          .         .        V.
     93         .7905        .04  Q            .          .         .        V.
     94         .7912        .04  Q            .          .         .        V.
     95         .7920        .04  Q            .          .         .        V.
     96         .7927        .04  Q            .          .         .        V.
     97         .7929        .01  Q            .          .         .        V.
     98         .7929        .00  Q            .          .         .        V.
*****************************************************************************
```

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

            U N I T - H Y D R O G R A P H   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL

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Especially prepared for:

MAINIERO, SMITH AND ASSOCIATES

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<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

**********DESCRIPTION OF RESULTS*********************************************
* Rio Vista Village                                                         *
* Area D                                                                    *
* 100 Year, 24 Hour Storm                                                   *
*****************************************************************************

*****************************************************************************
         WATERCOURSE LENGTH =     2260.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =      760.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =      26.400 FEET
         MANNINGS FRICTION FACTOR ALONG WATERCOURSE =  .015
         WATERSHED AREA =       35.260 ACRES
         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         DESERT S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =    .330
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) =  .900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =    .170
         BASEFLOW =   .000 CFS/SQUARE-MILE
         USER-ENTERED RAINFALL =  4.50 INCHES
         PROGRAM NUMBER  9 SELECTED


         WATERCOURSE "LAG" TIME =      .057 HOURS
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 438.221
         HYDROGRAPH BASEFLOW =     .000 CFS
         RCFC&WCD AREA ADJUSTMENT FACTOR(PLATE E-5.8) =  .9999


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                  Advanced Engineering Software [AES]
                           SERIAL No.I0618I
                  VER. 1.6C     RELEASE DATE: 2/21/86

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*****************************************************************************
                         UNIT HYDROGRAPH DETERMINATION
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	67.556	96.025
2	98.590	44.112
3	99.982	1.979
4	100.000	.025

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

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	.0090	.0081	.0009
2	.0135	.0121	.0013
3	.0135	.0121	.0013
4	.0180	.0162	.0018
5	.0135	.0121	.0013
6	.0135	.0121	.0013
7	.0135	.0121	.0013
8	.0180	.0162	.0018
9	.0180	.0162	.0018
10	.0180	.0162	.0018
11	.0225	.0202	.0022
12	.0225	.0202	.0022
13	.0225	.0202	.0022
14	.0225	.0202	.0022
15	.0225	.0202	.0022
16	.0270	.0243	.0027
17	.0270	.0243	.0027
18	.0315	.0283	.0031
19	.0315	.0283	.0031
20	.0360	.0324	.0036
21	.0270	.0243	.0027
22	.0315	.0283	.0031
23	.0360	.0324	.0036
24	.0360	.0324	.0036
25	.0405	.0364	.0040
26	.0405	.0364	.0040
27	.0450	.0405	.0045
28	.0450	.0405	.0045
29	.0450	.0405	.0045
30	.0495	.0445	.0049
31	.0540	.0486	.0054
32	.0585	.0526	.0058
33	.0675	.0607	.0067
34	.0675	.0607	.0067
35	.0720	.0648	.0072
36	.0765	.0688	.0076
37	.0855	.0769	.0085
38	.0900	.0810	.0090
39	.0945	.0850	.0094
40	.0990	.0874	.0116
41	.0675	.0607	.0067
42	.0675	.0607	.0067
43	.0900	.0810	.0090
44	.0900	.0810	.0090
45	.0855	.0769	.0085
46	.0855	.0769	.0085
47	.0765	.0688	.0076
48	.0810	.0729	.0081
49	.1125	.0768	.0357
50	.1170	.0757	.0413
51	.1260	.0746	.0514
52	.1305	.0735	.0570
53	.1530	.0724	.0806
54	.1530	.0714	.0816
55	.1035	.0703	.0332
56	.1035	.0693	.0342
57	.1215	.0683	.0532
58	.1170	.0673	.0497
59	.1170	.0663	.0507
60	.1125	.0653	.0472
61	.1080	.0643	.0436
62	.1035	.0634	.0401
63	.0855	.0625	.0230
64	.0855	.0615	.0239
65	.0180	.0162	.0018

66	.0180	.0162	.0018
67	.0135	.0121	.0013
68	.0135	.0121	.0013
69	.0225	.0202	.0022
70	.0225	.0202	.0022
71	.0225	.0202	.0022
72	.0180	.0162	.0018
73	.0180	.0162	.0018
74	.0180	.0162	.0018
75	.0135	.0121	.0013
76	.0090	.0081	.0009
77	.0135	.0121	.0013
78	.0180	.0162	.0018
79	.0135	.0121	.0013
80	.0090	.0081	.0009
81	.0135	.0121	.0013
82	.0135	.0121	.0013
83	.0135	.0121	.0013
84	.0090	.0081	.0009
85	.0135	.0121	.0013
86	.0090	.0081	.0009
87	.0135	.0121	.0013
88	.0090	.0081	.0009
89	.0135	.0121	.0013
90	.0090	.0081	.0009
91	.0090	.0081	.0009
92	.0090	.0081	.0009
93	.0090	.0081	.0009
94	.0090	.0081	.0009
95	.0090	.0081	.0009
96	.0090	.0081	.0009

TOTAL STORM RAINFALL(INCHES) = 4.50
TOTAL SOIL-LOSS(INCHES) = 3.49
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.01

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 10.2445
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.9756

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

         RCFC&WCD 24-HOUR RUNOFF HYDROGRAPH

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

         HYDROGRAPH IN FIFTEEN-MINUTE INTERVALS(CFS)

-----------------------------------------------------------------------------
INTERVAL# VOLUME(AF)   Q(CFS) 0.        5.0        10.0       15.0       20.0
-----------------------------------------------------------------------------
      1        .0018       .09  Q         .         .         .         .
      2        .0053       .17  Q         .         .         .         .
      3        .0092       .19  Q         .         .         .         .
      4        .0141       .24  Q         .         .         .         .
      5        .0185       .21  Q         .         .         .         .
      6        .0224       .19  Q         .         .         .         .
      7        .0264       .19  Q         .         .         .         .
      8        .0313       .24  Q         .         .         .         .
      9        .0365       .25  Q         .         .         .         .
     10        .0418       .26  Q         .         .         .         .
     11        .0480       .30  Q         .         .         .         .
     12        .0546       .32  Q         .         .         .         .
     13        .0612       .32  Q         .         .         .         .
     14        .0678       .32  Q         .         .         .         .
     15        .0744       .32  QV        .         .         .         .
     16        .0819       .36  QV        .         .         .         .
     17        .0898       .38  QV        .         .         .         .
     18        .0986       .43  QV        .         .         .         .
     19        .1079       .45  QV        .         .         .         .
     20        .1180       .49  QV        .         .         .         .
     21        .1268       .42  QV        .         .         .         .
     22        .1356       .43  QV        .         .         .         .
     23        .1458       .49  QV        .         .         .         .
     24        .1563       .51  .QV       .         .         .         .
     25        .1678       .55  .QV       .         .         .         .
     26        .1797       .57  .QV       .         .         .         .
     27        .1924       .62  .QV       .         .         .         .
     28        .2056       .64  .QV       .         .         .         .
     29        .2189       .64  .QV       .         .         .         .
     30        .2330       .68  .Q V      .         .         .         .
     31        .2484       .75  .Q V      .         .         .         .
     32        .2651       .81  .Q V      .         .         .         .
     33        .2840       .92  .Q V      .         .         .         .
     34        .3038       .96  .Q  V     .         .         .         .
     35        .3245      1.00  . Q V     .         .         .         .
     36        .3466      1.07  . Q V     .         .         .         .
     37        .3708      1.17  . Q V     .         .         .         .
     38        .3968      1.26  . Q  V    .         .         .         .
     39        .4241      1.32  . Q  V    .         .         .         .
     40        .4561      1.55  .  Q  V   .         .         .         .
     41        .4804      1.18  . Q   V   .         .         .         .
     42        .5005       .97  .Q    V   .         .         .         .
     43        .5247      1.18  . Q    V  .         .         .         .
     44        .5511      1.27  . Q    V  .         .         .         .
     45        .5766      1.24  . Q    V  .         .         .         .
     46        .6017      1.22  . Q     V .         .         .         .
     47        .6251      1.13  . Q     V .         .         .         .
     48        .6485      1.13  . Q     V .         .         .         .
     49        .7270      3.80  .      Q V.         .         .         .
     50        .8418      5.56  .         .Q        .         .         .
     51        .9829      6.83  .         .  Q      .         .         .
     52       1.1445      7.82  .         .    Q    .         .         .
     53       1.3584     10.35  .         .       V Q         .         .
     54       1.5961     11.51  .         .         .V Q      .         .
     55       1.7396      6.95  .         .  Q      .  V      .         .
     56       1.8410      4.91  .        Q.         .   V     .         .
     57       1.9792      6.69  .         .  Q      .     V   .         .
     58       2.1278      7.19  .         .   Q     .       V .         .
     59       2.2759      7.17  .         .   Q     .         V         .
```

```
     60      2.4178      6.87  .         .  Q      .         . V       .
     61      2.5495      6.37  .         . Q       .         .   V     .
     62      2.6708      5.87  .         .Q        .         .    V    .
     63      2.7548      4.07  .       Q .         .         .      V  .
     64      2.8250      3.40  .     Q   .         .         .      V  .
     65      2.8513      1.28  . Q       .         .         .       V .
     66      2.8575       .30  Q         .         .         .       V .
     67      2.8619       .21  Q         .         .         .       V .
     68      2.8659       .19  Q         .         .         .       V .
     69      2.8717       .28  Q         .         .         .       V .
     70      2.8782       .32  Q         .         .         .       V .
     71      2.8849       .32  Q         .         .         .       V .
     72      2.8906       .28  Q         .         .         .       V .
     73      2.8959       .26  Q         .         .         .       V .
     74      2.9012       .26  Q         .         .         .       V .
     75      2.9056       .21  Q         .         .         .        V.
     76      2.9086       .15  Q         .         .         .        V.
     77      2.9122       .17  Q         .         .         .        V.
     78      2.9170       .23  Q         .         .         .        V.
     79      2.9214       .21  Q         .         .         .        V.
     80      2.9245       .15  Q         .         .         .        V.
     81      2.9281       .17  Q         .         .         .        V.
     82      2.9320       .19  Q         .         .         .        V.
     83      2.9360       .19  Q         .         .         .        V.
     84      2.9390       .15  Q         .         .         .        V.
     85      2.9426       .17  Q         .         .         .        V.
     86      2.9456       .15  Q         .         .         .        V.
     87      2.9492       .17  Q         .         .         .        V.
     88      2.9523       .15  Q         .         .         .        V.
     89      2.9558       .17  Q         .         .         .        V.
     90      2.9589       .15  Q         .         .         .        V.
     91      2.9615       .13  Q         .         .         .        V.
     92      2.9642       .13  Q         .         .         .        V.
     93      2.9668       .13  Q         .         .         .        V.
     94      2.9694       .13  Q         .         .         .        V.
     95      2.9721       .13  Q         .         .         .        V.
     96      2.9747       .13  Q         .         .         .        V.
     97      2.9756       .04  Q         .         .         .        V.
     98      2.9756       .00  Q         .         .         .         V
     99      2.9756       .00  Q         .         .         .         V
****************************************************************************
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          U N I T - H Y D R O G R A P H   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
                      (RCFC&WCD) 1978 HYDROLOGY MANUAL

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                        Especially prepared for:

                    MAINIERO, SMITH AND ASSOCIATES

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**********DESCRIPTION OF RESULTS*********************************************
* Rio Vista Village                                                         *
* Area H4                                                                   *
* 100 Year, 24 Hour Storm                                                   *
*****************************************************************************

*****************************************************************************
         WATERCOURSE LENGTH =    2000.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =     500.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =      14.960 FEET
         MANNINGS FRICTION FACTOR ALONG WATERCOURSE =  .015
         WATERSHED AREA =       24.490 ACRES
         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         DESERT S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =    .410
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) =   .900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =    .205
         BASEFLOW =   .000 CFS/SQUARE-MILE
         USER-ENTERED RAINFALL =  4.50 INCHES
         PROGRAM NUMBER  9 SELECTED


         WATERCOURSE "LAG" TIME =      .051 HOURS
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 494.517
         HYDROGRAPH BASEFLOW =     .000 CFS
         RCFC&WCD AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000



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                   Advanced Engineering Software [AES]
                             SERIAL No.I06181
                   VER. 1.6C     RELEASE DATE: 2/21/86

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****************************************************************************
                         UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL           "S" GRAPH          UNIT HYDROGRAPH
     NUMBER           MEAN VALUES         ORDINATES(CFS)
----------------------------------------------------------------------------
        1                70.796               69.893
        2                99.195               28.037
        3                99.990                 .785
        4               100.000                 .010
****************************************************************************
```

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	.0090	.0081	.0009
2	.0135	.0121	.0013
3	.0135	.0121	.0013
4	.0180	.0162	.0018
5	.0135	.0121	.0013
6	.0135	.0121	.0013
7	.0135	.0121	.0013
8	.0180	.0162	.0018
9	.0180	.0162	.0018
10	.0180	.0162	.0018
11	.0225	.0202	.0022
12	.0225	.0202	.0022
13	.0225	.0202	.0022
14	.0225	.0202	.0022
15	.0225	.0202	.0022
16	.0270	.0243	.0027
17	.0270	.0243	.0027
18	.0315	.0283	.0031
19	.0315	.0283	.0031
20	.0360	.0324	.0036
21	.0270	.0243	.0027
22	.0315	.0283	.0031
23	.0360	.0324	.0036
24	.0360	.0324	.0036
25	.0405	.0364	.0040
26	.0405	.0364	.0040
27	.0450	.0405	.0045
28	.0450	.0405	.0045
29	.0450	.0405	.0045
30	.0495	.0445	.0049
31	.0540	.0486	.0054
32	.0585	.0526	.0058
33	.0675	.0607	.0067
34	.0675	.0607	.0067
35	.0720	.0648	.0072
36	.0765	.0688	.0076
37	.0855	.0769	.0085
38	.0900	.0810	.0090
39	.0945	.0850	.0094
40	.0990	.0891	.0099
41	.0675	.0607	.0067
42	.0675	.0607	.0067
43	.0900	.0810	.0090
44	.0900	.0810	.0090
45	.0855	.0769	.0085
46	.0855	.0769	.0085
47	.0765	.0688	.0076
48	.0810	.0729	.0081
49	.1125	.0952	.0173
50	.1170	.0938	.0232
51	.1260	.0924	.0336
52	.1305	.0910	.0395
53	.1530	.0896	.0634
54	.1530	.0882	.0648
55	.1035	.0869	.0166
56	.1035	.0856	.0179
57	.1215	.0843	.0372
58	.1170	.0830	.0340
59	.1170	.0817	.0353
60	.1125	.0805	.0320
61	.1080	.0792	.0288
62	.1035	.0780	.0255
63	.0855	.0768	.0087
64	.0855	.0757	.0098
65	.0180	.0162	.0018

66	.0180	.0162	.0018
67	.0135	.0121	.0013
68	.0135	.0121	.0013
69	.0225	.0202	.0022
70	.0225	.0202	.0022
71	.0225	.0202	.0022
72	.0180	.0162	.0018
73	.0180	.0162	.0018
74	.0180	.0162	.0018
75	.0135	.0121	.0013
76	.0090	.0081	.0009
77	.0135	.0121	.0013
78	.0180	.0162	.0018
79	.0135	.0121	.0013
80	.0090	.0081	.0009
81	.0135	.0121	.0013
82	.0135	.0121	.0013
83	.0135	.0121	.0013
84	.0090	.0081	.0009
85	.0135	.0121	.0013
86	.0090	.0081	.0009
87	.0135	.0121	.0013
88	.0090	.0081	.0009
89	.0135	.0121	.0013
90	.0090	.0081	.0009
91	.0090	.0081	.0009
92	.0090	.0081	.0009
93	.0090	.0081	.0009
94	.0090	.0081	.0009
95	.0090	.0081	.0009
96	.0090	.0081	.0009

TOTAL STORM RAINFALL(INCHES) = 4.50
TOTAL SOIL-LOSS(INCHES) = 3.75
TOTAL EFFECTIVE RAINFALL(INCHES) = .75

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 7.6474
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.5352

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

         RCFC&WCD 24-HOUR RUNOFF HYDROGRAPH

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

         HYDROGRAPH IN FIFTEEN-MINUTE INTERVALS(CFS)

----------------------------------------------------------------------------
INTERVAL# VOLUME(AF)   Q(CFS) 0.        2.5       5.0       7.5      10.0
----------------------------------------------------------------------------
      1        .0013       .06 Q         .         .         .         .
      2        .0038       .12 Q         .         .         .         .
      3        .0065       .13 Q         .         .         .         .
      4        .0099       .16 Q         .         .         .         .
      5        .0129       .15 Q         .         .         .         .
      6        .0157       .13 Q         .         .         .         .
      7        .0184       .13 Q         .         .         .         .
      8        .0219       .16 Q         .         .         .         .
      9        .0255       .18 Q         .         .         .         .
     10        .0292       .18 Q         .         .         .         .
     11        .0335       .21 Q         .         .         .         .
     12        .0381       .22 Q         .         .         .         .
     13        .0427       .22 QV        .         .         .         .
     14        .0473       .22 QV        .         .         .         .
     15        .0519       .22 QV        .         .         .         .
     16        .0571       .25 .Q        .         .         .         .
     17        .0626       .27 .Q        .         .         .         .
     18        .0688       .30 .Q        .         .         .         .
     19        .0752       .31 .Q        .         .         .         .
     20        .0822       .34 .QV       .         .         .         .
     21        .0883       .29 .QV       .         .         .         .
     22        .0945       .30 .QV       .         .         .         .
     23        .1015       .34 .QV       .         .         .         .
     24        .1089       .36 .QV       .         .         .         .
     25        .1168       .39 .Q V      .         .         .         .
     26        .1251       .40 .Q V      .         .         .         .
     27        .1340       .43 .Q V      .         .         .         .
     28        .1432       .44 .Q V      .         .         .         .
     29        .1524       .44 .Q V      .         .         .         .
     30        .1622       .48 .Q  V     .         .         .         .
     31        .1729       .52 . Q V     .         .         .         .
     32        .1846       .56 . Q V     .         .         .         .
     33        .1978       .64 . Q  V    .         .         .         .
     34        .2116       .67 . Q  V    .         .         .         .
     35        .2260       .70 . Q  V    .         .         .         .
     36        .2413       .74 . Q   V   .         .         .         .
     37        .2582       .82 .  Q  V   .         .         .         .
     38        .2763       .87 .  Q   V  .         .         .         .
     39        .2953       .92 .  Q   V  .         .         .         .
     40        .3152       .96 .  Q    V .         .         .         .
     41        .3308       .76 .  Q    V .         .         .         .
     42        .3447       .67 . Q     V .         .         .         .
     43        .3617       .82 .  Q     V.         .         .         .
     44        .3800       .89 .  Q     V.         .         .         .
     45        .3977       .86 .  Q      V         .         .         .
     46        .4151       .84 .  Q      V         .         .         .
     47        .4313       .78 .  Q      .V        .         .         .
     48        .4476       .79 .  Q      .V        .         .         .
     49        .4773      1.44 .    Q    . V       .         .         .
     50        .5210      2.11 .       Q .  V      .         .         .
     51        .5833      3.01 .         . Q  V    .         .         .
     52        .6602      3.72 .         .   Q  V  .         .         .
     53        .7752      5.57 .         .         V Q       .         .
     54        .9061      6.33 .         .         .  V Q    .         .
     55        .9686      3.03 .         . Q       .    V    .         .
     56       1.0052      1.77 .      Q  .         .     V   .         .
     57       1.0696      3.12 .         . Q       .      V  .         .
     58       1.1405      3.43 .         .  Q      .        V.         .
     59       1.2118      3.45 .         .  Q      .         .V        .
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    60     1.2790     3.25  .         .  Q      .         .  V      .
    61     1.3397     2.94  .         .Q        .         .   V     .
    62     1.3937     2.61  .         Q         .         .     V   .
    63     1.4214     1.34  .    Q    .         .         .      V  .
    64     1.4410      .95  .  Q      .         .         .      V  .
    65     1.4495      .41  .Q        .         .         .      V  .
    66     1.4533      .18  Q         .         .         .      V  .
    67     1.4563      .15  Q         .         .         .      V  .
    68     1.4591      .13  Q         .         .         .       V .
    69     1.4631      .20  Q         .         .         .       V .
    70     1.4677      .22  Q         .         .         .       V .
    71     1.4723      .22  Q         .         .         .       V .
    72     1.4762      .19  Q         .         .         .       V .
    73     1.4799      .18  Q         .         .         .       V .
    74     1.4836      .18  Q         .         .         .       V .
    75     1.4866      .15  Q         .         .         .       V .
    76     1.4887      .10  Q         .         .         .       V .
    77     1.4912      .12  Q         .         .         .       V .
    78     1.4946      .16  Q         .         .         .       V .
    79     1.4976      .15  Q         .         .         .        V.
    80     1.4997      .10  Q         .         .         .        V.
    81     1.5022      .12  Q         .         .         .        V.
    82     1.5050      .13  Q         .         .         .        V.
    83     1.5077      .13  Q         .         .         .        V.
    84     1.5098      .10  Q         .         .         .        V.
    85     1.5123      .12  Q         .         .         .        V.
    86     1.5144      .10  Q         .         .         .        V.
    87     1.5169      .12  Q         .         .         .        V.
    88     1.5190      .10  Q         .         .         .        V.
    89     1.5215      .12  Q         .         .         .        V.
    90     1.5236      .10  Q         .         .         .        V.
    91     1.5254      .09  Q         .         .         .        V.
    92     1.5273      .09  Q         .         .         .        V.
    93     1.5291      .09  Q         .         .         .        V.
    94     1.5309      .09  Q         .         .         .        V.
    95     1.5328      .09  Q         .         .         .        V.
    96     1.5346      .09  Q         .         .         .        V.
    97     1.5351      .03  Q         .         .         .        V.
    98     1.5352      .00  Q         .         .         .        V.
    99     1.5352      .00  Q         .         .         .        V.
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Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade in Retention Basins

Simplified Method to Establish the 100-Year, 1-Hour Storm Hydraulic Grade Line in Retention Basins

Criteria:

In the Rio Vista project, several storm drains drain into retention basins during storm events. The retention basins are designed to retain 100% of the 100-year, 24-storm runoff. However, the storm drain and catch basin systems are designed to convey the 100-year, 1-hour storm. The following is our approach to establish the appropriate elevation for the hydraulic grade line at the outlet of each storm drain system.

Proposed Hydraulic Approach:

Using the "Shortcut Method" Synthetic Unit Hydrograph from the RCFC & WCD Hydrology Manual, we adjust the percentage rainfall in accordance with the Rainfall Pattern for the 100-year, 1-hour storm graph attached. We adjust the "constant loss rate" until the peak 100-year, 1-hour storm runoff rate equals the Rational Method peak runoff rate. In our sample problem, 15.20 acres produce 46.7 cubic feet per second of peak runoff. The Runoff Pattern graph attached indicates the runoff per 2.5-minute periods from the Shortcut Method calculations. In the "Shortcut Method", we allow a small portion of the runoff to percolate in the bottom of the basin. This percolation value is based on the size of the basin and the allowable percolation rate. Using the "Accumulated Volume" information for unit time period #13, we can estimate the maximum volume in each retention basin at the time of peak 100-year runoff. This volume will provide the Hydraulic Grade Line elevation for each storm drain system.

Results:

Results from the "Shortcut Method" indicate the depth in the retention basin is shallow at the time of peak runoff. This result is anticipated due to the nature of the 1-hour storm (thunderstorm type event).

RCFC & WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD Unit Hydrograph, Effective Rain and Retention Basin Calculation Form	Project 1064 "Sample Problem" Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	15.2	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	2.7	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.35	[16] RETENTION BASIN PERCOLATION-INCHE!	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20]/100	[22] LOSS RATE in MAX	[22] LOSS RATE in LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.113	0.000	0.000	0.018	0.0001	0.0024	-0.0024	0.000
2.000	0.210	0.003	0.113	0.003	0.000	0.124	0.0004	0.0024	-0.0020	0.000
3.000	0.520	0.008	0.113	0.007	0.001	0.306	0.0011	0.0024	-0.0014	0.000
4.000	0.890	0.014	0.113	0.013	0.001	0.524	0.0018	0.0024	-0.0006	0.000
5.000	1.410	0.023	0.113	0.020	0.002	0.830	0.0029	0.0024	0.0004	0.000
6.000	2.110	0.034	0.113	0.030	0.003	1.242	0.0043	0.0024	0.0018	0.002
7.000	3.060	0.049	0.113	0.044	0.005	1.801	0.0062	0.0024	0.0038	0.006
8.000	4.190	0.067	0.113	0.060	0.007	2.466	0.0085	0.0024	0.0061	0.012
9.000	5.600	0.090	0.113	0.081	0.009	3.296	0.0113	0.0024	0.0089	0.021
10.000	7.410	0.119	0.113	0.107	0.012	4.361	0.0150	0.0024	0.0126	0.034
11.000	9.790	0.157	0.113	0.141	0.044	16.236	0.0559	0.0024	0.0535	0.087
12.000	14.980	0.240	0.113	0.216	0.127	46.782	0.1611	0.0024	0.1587	0.246
13.000	14.980	0.240	0.113	0.216	0.127	46.782	0.1611	0.0024	0.1587	0.404
14.000	9.790	0.157	0.113	0.141	0.044	16.236	0.0559	0.0024	0.0535	0.458
15.000	7.410	0.119	0.113	0.107	0.012	4.361	0.0150	0.0024	0.0126	0.470
16.000	5.600	0.090	0.113	0.081	0.009	3.296	0.0113	0.0024	0.0089	0.479
17.000	4.190	0.067	0.113	0.060	0.007	2.466	0.0085	0.0024	0.0061	0.485
18.000	3.060	0.049	0.113	0.044	0.005	1.801	0.0062	0.0024	0.0038	0.489
19.000	2.110	0.034	0.113	0.030	0.003	1.242	0.0043	0.0024	0.0018	0.491
20.000	1.410	0.023	0.113	0.020	0.002	0.830	0.0029	0.0024	0.0004	0.492
21.000	0.890	0.014	0.113	0.013	0.001	0.524	0.0018	0.0024	-0.0006	0.491
22.000	0.520	0.008	0.113	0.007	0.001	0.306	0.0011	0.0024	-0.0014	0.490
23.000	0.210	0.003	0.113	0.003	0.000	0.124	0.0004	0.0024	-0.0020	0.488
24.000	0.030	0.000	0.113	0.000	0.000	0.018	0.0001	0.0024	-0.0024	0.485
TOTALS					0.4240	155.9700				MAX: .492

"SAMPLE PROBLEM"

EFFECTIVE RAIN = 0.018 INCHES/ACRE

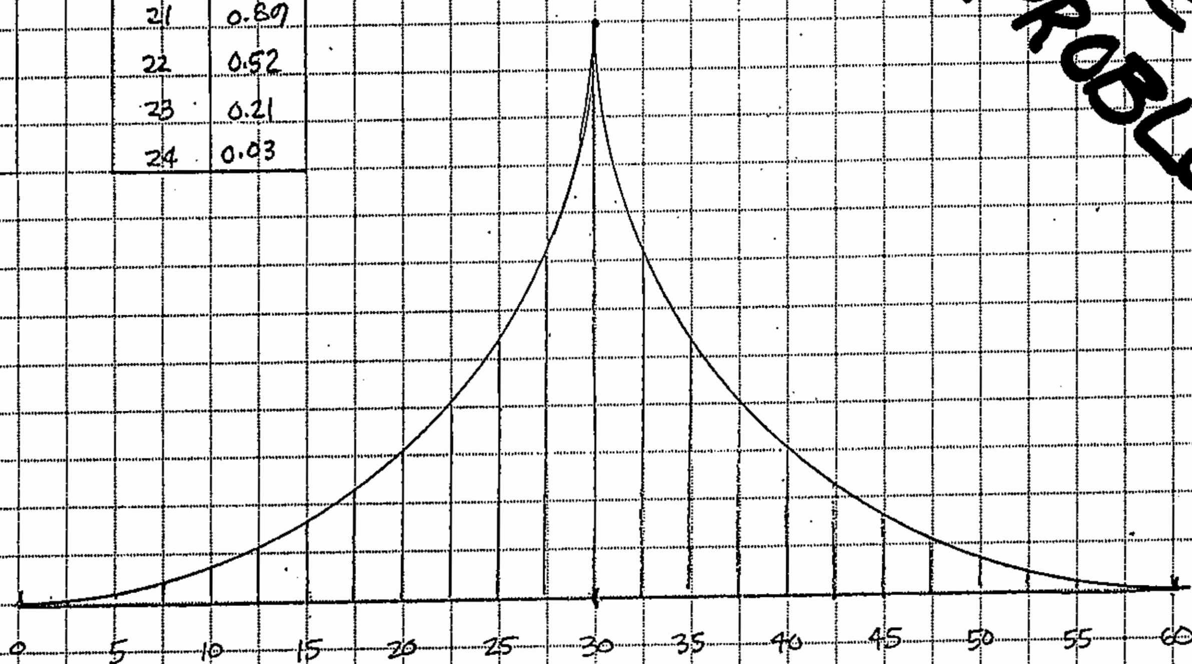
MAX RETENTION = 0.492 ACRE-FT

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

JOB 1064 RIO VISTA
SHEET NO. ____ OF ____
CALCULATED BY ____ DATE 2-12-01
CHECKED BY ____ DATE ____
SCALE ____

"SAMPLE PROBLEM"

PERIOD	% STORM	PERIOD	% STORM
1	0.03	13	14.78
2	0.21	14	9.79
3	0.52	15	7.41
4	0.89	16	5.60
5	1.41	17	4.19
6	2.11	18	3.06
7	3.06	19	2.11
8	4.19	20	1.41
9	5.60	21	0.89
10	7.41	22	0.52
11	9.79	23	0.21
12	14.78	24	0.03



RAINFALL PATTERN FOR
100-YEAR, 1-HOUR STORM

MAINIERO, SMITH AND ASSOCIATES, INC.
Planning/Civil Engineering/Land Surveying
777 E. Tahquitz Canyon Way Suite 301
PALM SPRINGS, CALIFORNIA 92262-6784
(760) 320-9811 FAX (760) 323-7893

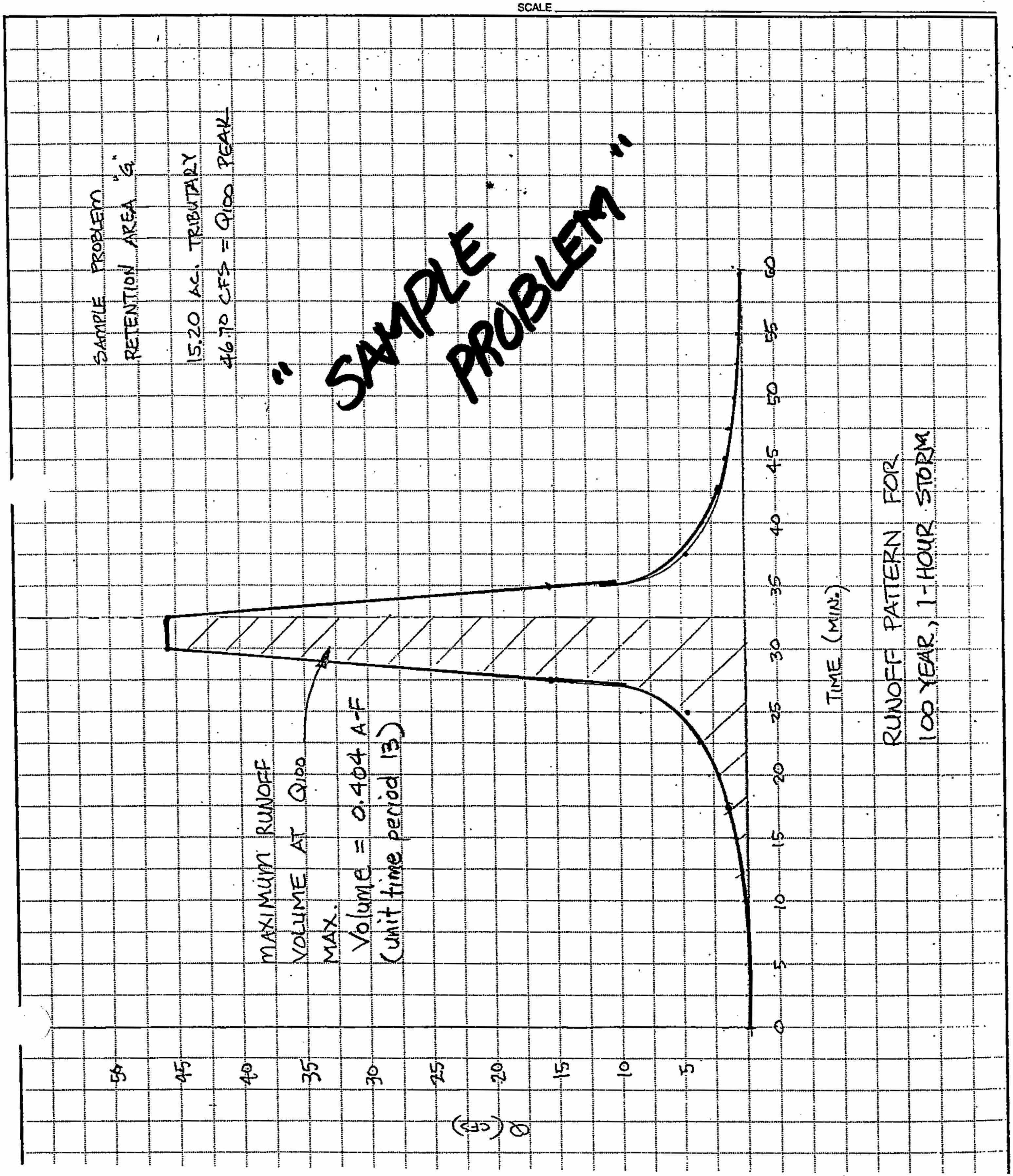
JOB 1064 RIO VISTA

SHEET NO. ______ OF ______

CALCULATED BY ______ DATE 2-12-01

CHECKED BY ______ DATE ______

SCALE ______



RCFC&WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD Unit Hydrograph, Effective Rain and Retention Basin Calculation Form	Project 1064 Retention Basin B Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	21.04	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	3.18	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.36835	[16] RETENTION BASIN PERCOLATION-INCHES	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20] / 100	[22] LOSS RATE in MAX	[22] LOSS RATE in LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.133	0.000	0.000	0.024	0.0001	0.0026	-0.0025	0.000
2.000	0.210	0.003	0.133	0.003	0.000	0.171	0.0006	0.0026	-0.0020	0.000
3.000	0.520	0.008	0.133	0.007	0.001	0.424	0.0015	0.0026	-0.0011	0.000
4.000	0.890	0.014	0.133	0.013	0.001	0.725	0.0025	0.0026	-0.0001	0.000
5.000	1.410	0.023	0.133	0.020	0.002	1.149	0.0040	0.0026	0.0014	0.001
6.000	2.110	0.034	0.133	0.030	0.003	1.719	0.0059	0.0026	0.0034	0.005
7.000	3.060	0.049	0.133	0.044	0.005	2.493	0.0086	0.0026	0.0060	0.011
8.000	4.190	0.067	0.133	0.060	0.007	3.413	0.0118	0.0026	0.0092	0.020
9.000	5.600	0.090	0.133	0.081	0.009	4.562	0.0157	0.0026	0.0132	0.033
10.000	7.410	0.119	0.133	0.107	0.012	6.037	0.0208	0.0026	0.0182	0.051
11.000	9.790	0.157	0.133	0.141	0.024	12.291	0.0423	0.0026	0.0398	0.091
12.000	14.980	0.240	0.133	0.216	0.107	54.573	0.1879	0.0026	0.1854	0.276
13.000	14.980	0.240	0.133	0.216	0.107	54.573	0.1879	0.0026	0.1854	0.462
14.000	9.790	0.157	0.133	0.141	0.024	12.291	0.0423	0.0026	0.0398	0.502
15.000	7.410	0.119	0.133	0.107	0.012	6.037	0.0208	0.0026	0.0182	0.520
16.000	5.600	0.090	0.133	0.081	0.009	4.562	0.0157	0.0026	0.0132	0.533
17.000	4.190	0.067	0.133	0.060	0.007	3.413	0.0118	0.0026	0.0092	0.542
18.000	3.060	0.049	0.133	0.044	0.005	2.493	0.0086	0.0026	0.0060	0.548
19.000	2.110	0.034	0.133	0.030	0.003	1.719	0.0059	0.0026	0.0034	0.552
20.000	1.410	0.023	0.133	0.020	0.002	1.149	0.0040	0.0026	0.0014	0.553
21.000	0.890	0.014	0.133	0.013	0.001	0.725	0.0025	0.0026	-0.0001	0.553
22.000	0.520	0.008	0.133	0.007	0.001	0.424	0.0015	0.0026	-0.0011	0.552
23.000	0.210	0.003	0.133	0.003	0.000	0.171	0.0006	0.0026	-0.0020	0.550
24.000	0.030	0.000	0.133	0.000	0.000	0.024	0.0001	0.0026	-0.0025	0.547
TOTALS					0.3440	175.1619				MAX: .553

EFFECTIVE RAIN = 0.014 INCHES/ACRE

MAX RETENTION = 0.553 ACRE-FT

R:\Documents\1064\Originals\STORMDRAIN CALCS\[jad Unit Hydrograph Effective Rain and C Basin 100 1hr.xls],

3/13/01 7:56 AM MAINIERO, SMITH ASSOCIATES, INC.

RCFC & WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD Unit Hydrograph, Effective Rain and Retention Basin Calculation Form	Project 1064 Retention Basin C Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	8.46	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	2.66	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.259	[16] RETENTION BASIN PERCOLATION-INCHES	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20]/100	[22] LOSS RATE in MAX	[22] LOSS RATE in LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.111	0.000	0.000	0.010	0.0000	0.0018	-0.0018	0.000
2.000	0.210	0.003	0.111	0.003	0.000	0.069	0.0002	0.0018	-0.0016	0.000
3.000	0.520	0.008	0.111	0.007	0.001	0.170	0.0006	0.0018	-0.0012	0.000
4.000	0.890	0.014	0.111	0.013	0.001	0.292	0.0010	0.0018	-0.0008	0.000
5.000	1.410	0.023	0.111	0.020	0.002	0.462	0.0016	0.0018	-0.0002	0.000
6.000	2.110	0.034	0.111	0.030	0.003	0.691	0.0024	0.0018	0.0006	0.001
7.000	3.060	0.049	0.111	0.044	0.005	1.002	0.0035	0.0018	0.0017	0.002
8.000	4.190	0.067	0.111	0.060	0.007	1.373	0.0047	0.0018	0.0029	0.005
9.000	5.600	0.090	0.111	0.081	0.009	1.834	0.0063	0.0018	0.0045	0.010
10.000	7.410	0.119	0.111	0.107	0.012	2.427	0.0084	0.0018	0.0066	0.016
11.000	9.790	0.157	0.111	0.141	0.046	9.378	0.0323	0.0018	0.0305	0.047
12.000	14.980	0.240	0.111	0.216	0.129	26.379	0.0908	0.0018	0.0890	0.136
13.000	14.980	0.240	0.111	0.216	0.129	26.379	0.0908	0.0018	0.0890	0.225
14.000	9.790	0.157	0.111	0.141	0.046	9.378	0.0323	0.0018	0.0305	0.255
15.000	7.410	0.119	0.111	0.107	0.012	2.427	0.0084	0.0018	0.0066	0.262
16.000	5.600	0.090	0.111	0.081	0.009	1.834	0.0063	0.0018	0.0045	0.266
17.000	4.190	0.067	0.111	0.060	0.007	1.373	0.0047	0.0018	0.0029	0.269
18.000	3.060	0.049	0.111	0.044	0.005	1.002	0.0035	0.0018	0.0017	0.271
19.000	2.110	0.034	0.111	0.030	0.003	0.691	0.0024	0.0018	0.0006	0.272
20.000	1.410	0.023	0.111	0.020	0.002	0.462	0.0016	0.0018	-0.0002	0.271
21.000	0.890	0.014	0.111	0.013	0.001	0.292	0.0010	0.0018	-0.0008	0.271
22.000	0.520	0.008	0.111	0.007	0.001	0.170	0.0006	0.0018	-0.0012	0.269
23.000	0.210	0.003	0.111	0.003	0.000	0.069	0.0002	0.0018	-0.0016	0.268
24.000	0.030	0.000	0.111	0.000	0.000	0.010	0.0000	0.0018	-0.0018	0.266
TOTALS					0.4307	88.1745				MAX: .272

EFFECTIVE RAIN = 0.018 INCHES/ACRE

MAX RETENTION = 0.272 ACRE-FT

RCFC&WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD **Unit Hydrograph, Effective Rain and Retention Basin Calculation Form**	Project 1064 Retention Basin D Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	33.79	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	3.18	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.738	[16] RETENTION BASIN PERCOLATION-INCHES	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20] / 100	[22] LOSS RATE in MAX	LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.133	0.000	0.000	0.039	0.0001	0.0051	-0.0050	0.000
2.000	0.210	0.003	0.133	0.003	0.000	0.275	0.0009	0.0051	-0.0042	0.000
3.000	0.520	0.008	0.133	0.007	0.001	0.680	0.0023	0.0051	-0.0028	0.000
4.000	0.890	0.014	0.133	0.013	0.001	1.164	0.0040	0.0051	-0.0011	0.000
5.000	1.410	0.023	0.133	0.020	0.002	1.845	0.0064	0.0051	0.0012	0.001
6.000	2.110	0.034	0.133	0.030	0.003	2.761	0.0095	0.0051	0.0044	0.006
7.000	3.060	0.049	0.133	0.044	0.005	4.004	0.0138	0.0051	0.0087	0.014
8.000	4.190	0.067	0.133	0.060	0.007	5.482	0.0189	0.0051	0.0138	0.028
9.000	5.600	0.090	0.133	0.081	0.009	7.327	0.0252	0.0051	0.0201	0.048
10.000	7.410	0.119	0.133	0.107	0.012	9.695	0.0334	0.0051	0.0283	0.076
11.000	9.790	0.157	0.133	0.141	0.024	19.740	0.0680	0.0051	0.0628	0.139
12.000	14.980	0.240	0.133	0.216	0.107	87.643	0.3018	0.0051	0.2967	0.436
13.000	14.980	0.240	0.133	0.216	0.107	87.643	0.3018	0.0051	0.2967	0.733
14.000	9.790	0.157	0.133	0.141	0.024	19.740	0.0680	0.0051	0.0628	0.795
15.000	7.410	0.119	0.133	0.107	0.012	9.695	0.0334	0.0051	0.0283	0.824
16.000	5.600	0.090	0.133	0.081	0.009	7.327	0.0252	0.0051	0.0201	0.844
17.000	4.190	0.067	0.133	0.060	0.007	5.482	0.0189	0.0051	0.0138	0.858
18.000	3.060	0.049	0.133	0.044	0.005	4.004	0.0138	0.0051	0.0087	0.866
19.000	2.110	0.034	0.133	0.030	0.003	2.761	0.0095	0.0051	0.0044	0.871
20.000	1.410	0.023	0.133	0.020	0.002	1.845	0.0064	0.0051	0.0012	0.872
21.000	0.890	0.014	0.133	0.013	0.001	1.164	0.0040	0.0051	-0.0011	0.871
22.000	0.520	0.008	0.133	0.007	0.001	0.680	0.0023	0.0051	-0.0028	0.868
23.000	0.210	0.003	0.133	0.003	0.000	0.275	0.0009	0.0051	-0.0042	0.864
24.000	0.030	0.000	0.133	0.000	0.000	0.039	0.0001	0.0051	-0.0050	0.859
TOTALS					0.3440	281.3081				MAX: .872

EFFECTIVE RAIN = 0.014 INCHES/ACRE

MAX RETENTION = 0.872 ACRE-FT

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3/12/01 12:37 PM MAINIERO, SMITH ASSOCIATES, INC.

RCFC & WCD HYDROLOGY MANUAL	"SHORTCUT METHOD" SYNTHETIC UNIT HYDROGRAPH METHOD Unit Hydrograph, Effective Rain and Retention Basin Calculation Form	Project 1064 Retention Basin H1 Net rain 100 yr. 1 hr. By JAD Date Checked Date	Sheet 1 of 1

[1] CONCENTRATION POINT	0	[2] AREA DESIGNATION	
[3] DRAINAGE AREA-ACRES	8.69	[4] ULTIMATE DISCHARGE-CFS-HRS/IN (645*[3])	0
[5] UNIT TIME-MINUTES	2.5	[6] LAG TIME-MINUTES	0
[7] UNIT TIME-PERCENT OF LAG (100*[5]/[6])	0	[8] S-CURVE	0
[9] STORM FREQUENCY & DURATION 100 YEAR-	1 HOUR	[10] TOTAL ADJUSTED STORM RAIN-INCHES	1.6
[11] VARIABLE LOSS RATE (AVG)-INCHES/HOUR	0	[12] MINIMUM LOSS RATE (FOR VAR. LOSS)-IN/HR	0
[13] CONSTANT LOSS RATE-INCHES/HOUR	3.69	[14] LOW LOSS RATE-PERCENT	90
[15] RETENTION BASIN AREA-ACRES	0.1218	[16] RETENTION BASIN PERCOLATION-INCHE!	2

	EFFECTIVE RAIN					FLOOD HYDROGRAPH	RETENTION BASIN PERCOLATION			
[17] UNIT TIME PERIOD minutes	[20] PATTERN PERCENT (PL E-5.9)	[21] STORM RAIN in [10][20] / 100	[22] LOSS RATE in MAX	[22] LOSS RATE in LOW	[23] EFFECTIVE RAIN in [21]-[22]	[24] FLOW cfs	[25] EFFECTIVE RUNOFF acre-ft [23][3]/12	[26] PERCOLATION acre-ft [15][16]	[27] RETENTION PER PERIOD [25]-[26]	[28] ACCUMULATED VOLUME
1.000	0.030	0.000	0.154	0.000	0.000	0.010	0.0000	0.0008	-0.0008	0.000
2.000	0.210	0.003	0.154	0.003	0.000	0.071	0.0002	0.0008	-0.0006	0.000
3.000	0.520	0.008	0.154	0.007	0.001	0.175	0.0006	0.0008	-0.0002	0.000
4.000	0.890	0.014	0.154	0.013	0.001	0.299	0.0010	0.0008	0.0002	0.000
5.000	1.410	0.023	0.154	0.020	0.002	0.474	0.0016	0.0008	0.0008	0.001
6.000	2.110	0.034	0.154	0.030	0.003	0.710	0.0024	0.0008	0.0016	0.003
7.000	3.060	0.049	0.154	0.044	0.005	1.030	0.0035	0.0008	0.0027	0.005
8.000	4.190	0.067	0.154	0.060	0.007	1.410	0.0049	0.0008	0.0040	0.009
9.000	5.600	0.090	0.154	0.081	0.009	1.884	0.0065	0.0008	0.0056	0.015
10.000	7.410	0.119	0.154	0.107	0.012	2.493	0.0086	0.0008	0.0077	0.023
11.000	9.790	0.157	0.154	0.141	0.016	3.294	0.0113	0.0008	0.0105	0.033
12.000	14.980	0.240	0.154	0.216	0.086	18.071	0.0622	0.0008	0.0614	0.095
13.000	14.980	0.240	0.154	0.216	0.086	18.071	0.0622	0.0008	0.0614	0.156
14.000	9.790	0.157	0.154	0.141	0.016	3.294	0.0113	0.0008	0.0105	0.166
15.000	7.410	0.119	0.154	0.107	0.012	2.493	0.0086	0.0008	0.0077	0.174
16.000	5.600	0.090	0.154	0.081	0.009	1.884	0.0065	0.0008	0.0056	0.180
17.000	4.190	0.067	0.154	0.060	0.007	1.410	0.0049	0.0008	0.0040	0.184
18.000	3.060	0.049	0.154	0.044	0.005	1.030	0.0035	0.0008	0.0027	0.187
19.000	2.110	0.034	0.154	0.030	0.003	0.710	0.0024	0.0008	0.0016	0.188
20.000	1.410	0.023	0.154	0.020	0.002	0.474	0.0016	0.0008	0.0008	0.189
21.000	0.890	0.014	0.154	0.013	0.001	0.299	0.0010	0.0008	0.0002	0.189
22.000	0.520	0.008	0.154	0.007	0.001	0.175	0.0006	0.0008	-0.0002	0.189
23.000	0.210	0.003	0.154	0.003	0.000	0.071	0.0002	0.0008	-0.0006	0.188
24.000	0.030	0.000	0.154	0.000	0.000	0.010	0.0000	0.0008	-0.0008	0.187
TOTALS					0.2846	59.8432				MAX: .189

EFFECTIVE RAIN = 0.012 INCHES/ACRE

MAX RETENTION = 0.189 ACRE-FT

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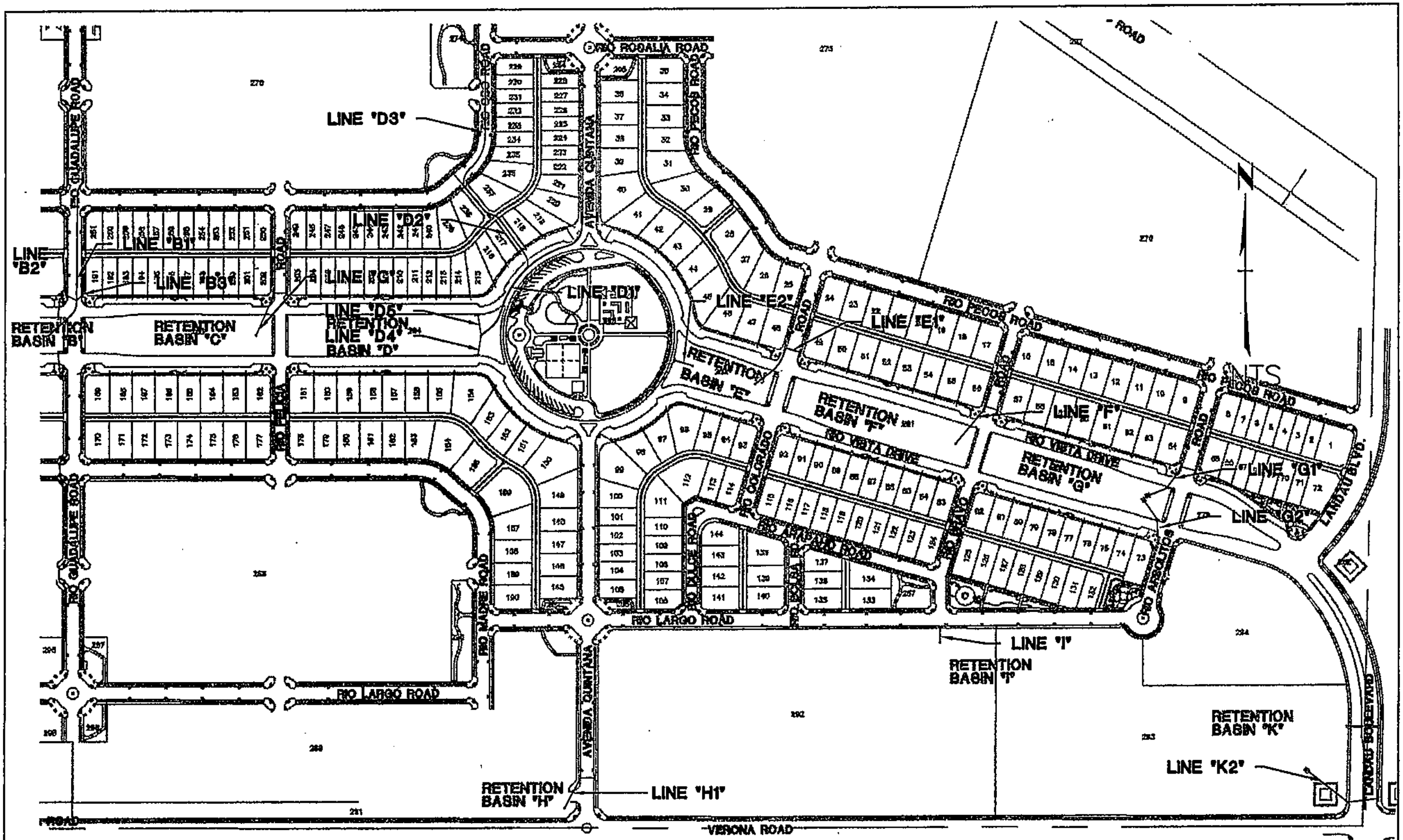
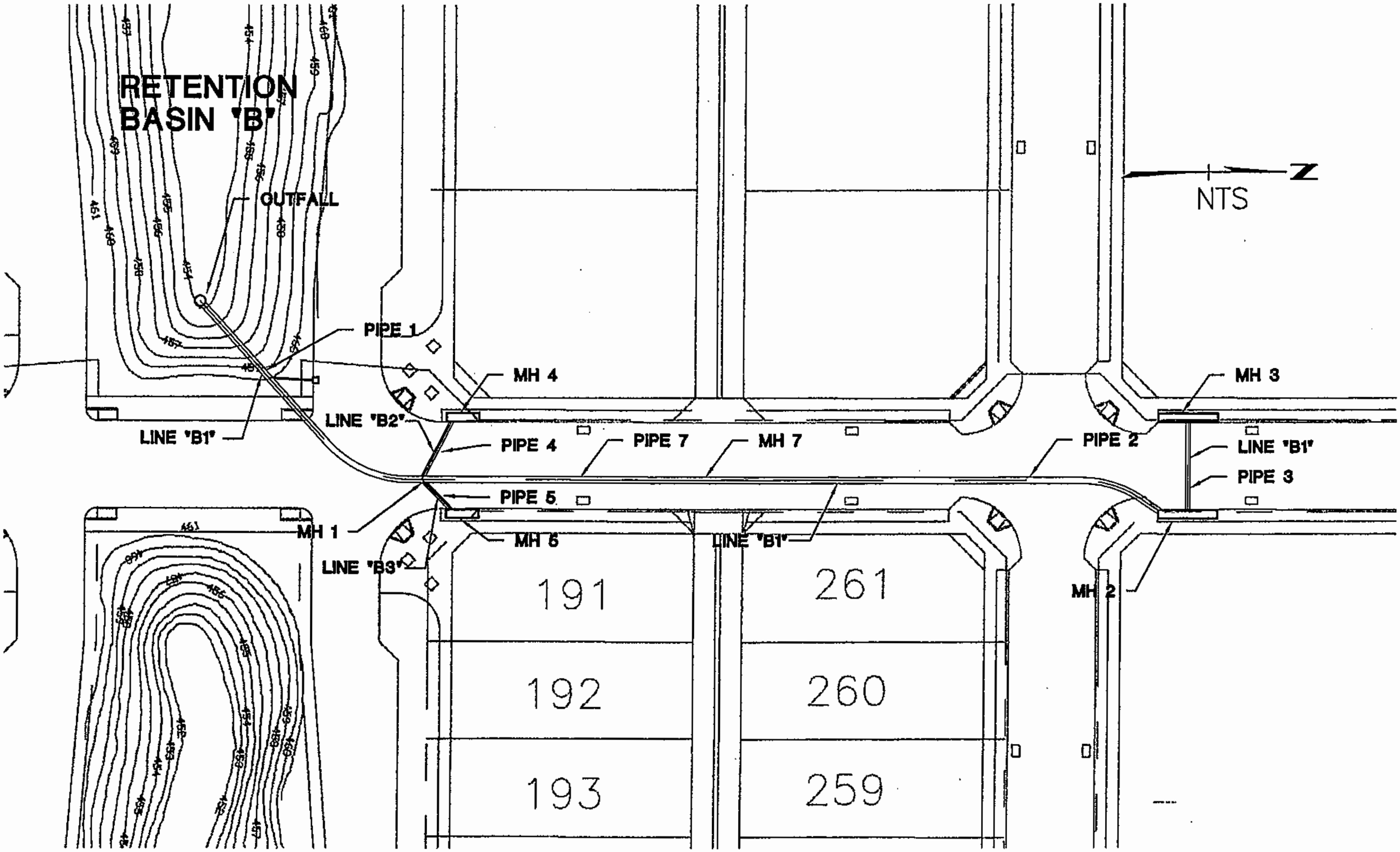
MAINIERO, SMITH ASSOCIATES, INC.

Storm Drain System
Hydraulic Calculations



STORM DRAIN MAP



STORM DRAIN LINE "B1,B2,B3"

Storm Drain Line "B-1, B-2, B-3"

PIPE DESCRIPTION: Pipe 1

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= CONC
Pipe Length	= 118.77 ft
Plan Length	= 118.77 ft
Pipe Type	= Circular
Pipe Dimensions	= 33.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 79.62 cfs
Invert Elevation Downstream	= 447.35 ft
Invert Elevation Upstream	= 450.04 ft
Invert Slope	= 2.33%
Invert Slope (Plan Length)	= 2.27%
Rim Elevation Downstream	= 454.00 ft
Rim Elevation Upstream	= 461.92 ft
Natural Ground Slope	= 6.67%
Crown Elevation Downstream	= 450.10 ft
Crown Elevation Upstream	= 452.79 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.46 min
Total Intensity	= 12.77 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 54.55 cfs
Uniform Capacity	= 79.62 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 455.20 ft
HGL Elevation Upstream	= 456.46 ft
HGL Slope	= 1.09 %
EGL Elevation Downstream	= 456.51 ft
EGL Elevation Upstream	= 457.78 ft
EGL Slope	= 1.09 %
Critical Depth	= 28.90 in
Depth Downstream	= 33.00 in
Depth Upstream	= 33.00 in
Velocity Downstream	= 9.18 ft/s
Velocity Upstream	= 9.18 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 5.94 ft^2
Area Upstream	= 5.94 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.656 ft

—INLET INFORMATION—

Downstream Inlet	= Outfall
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000

Storm Drain Line "B-1, B-2, B-3"

Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 7
---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 7
Downstream Pipe = Pipe 1
Pipe Material = CONC
Pipe Length = 121.77 ft
Plan Length = 121.77 ft
Pipe Type = Circular
Pipe Dimensions = 27.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 41.59 cfs
Invert Elevation Downstream = 450.67 ft
Invert Elevation Upstream = 452.87 ft
Invert Slope = 1.81%
Invert Slope (Plan Length) = 1.81%
Rim Elevation Downstream = 461.92 ft
Rim Elevation Upstream = 463.00 ft
Natural Ground Slope = 0.89%
Crown Elevation Downstream = 452.92 ft
Crown Elevation Upstream = 455.12 ft

---FLOW INFORMATION---
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 0.00 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.29 min
Total Intensity = 12.89 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 41.52 cfs
Uniform Capacity = 41.59 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

---HYDRAULIC INFORMATION---
HGL Elevation Downstream = 457.12 ft
HGL Elevation Upstream = 459.31 ft

Storm Drain Line "B-1, B-2, B-3"

HGL Slope = 1.80 %
EGL Elevation Downstream = 458.81 ft
EGL Elevation Upstream = 461.00 ft
EGL Slope = 1.80 %
Critical Depth = 25.33 in
Depth Downstream = 27.00 in
Depth Upstream = 27.00 in
Velocity Downstream = 10.44 ft/s
Velocity Upstream = 10.44 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 3.98 ft^2
Area Upstream = 3.98 ft^2
Kj (JLC) = 0.00
Calculated Junction Loss = 0.002 ft

---INLET INFORMATION---
Downstream Inlet = MH 1
Inlet Description = <None>
Inlet Type = Undefined
Computation Case = Sag
Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 2
---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 2
Downstream Pipe = Pipe 7
Pipe Material = CONC
Pipe Length = 180.99 ft
Plan Length = 180.99 ft
Pipe Type = Circular
Pipe Dimensions = 27.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 54.45 cfs
Invert Elevation Downstream = 452.87 ft
Invert Elevation Upstream = 458.47 ft
Invert Slope = 3.36%
Invert Slope (Plan Length) = 3.09%
Rim Elevation Downstream = 463.00 ft
Rim Elevation Upstream = 465.73 ft
Natural Ground Slope = 1.51%
Crown Elevation Downstream = 455.12 ft

Crown Elevation Upstream	= 460.72 ft

---FLOW INFORMATION---

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 20.76 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.09 min
Total Intensity	= 13.04 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 41.52 cfs
Uniform Capacity	= 54.45 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

---HYDRAULIC INFORMATION---

HGL Elevation Downstream	= 459.31 ft
HGL Elevation Upstream	= 462.57 ft
HGL Slope	= 1.96 %
EGL Elevation Downstream	= 461.01 ft
EGL Elevation Upstream	= 464.26 ft
EGL Slope	= 1.96 %
Critical Depth	= 25.33 in
Depth Downstream	= 27.00 in
Depth Upstream	= 27.00 in
Velocity Downstream	= 10.44 ft/s
Velocity Upstream	= 10.44 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.98 ft^2
Area Upstream	= 3.98 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.848 ft

---INLET INFORMATION---

Downstream Inlet	= MH 7
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 3

Storm Drain Line "B-1, B-2, B-3"

---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 3
Downstream Pipe = Pipe 2
Pipe Material = CONC
Pipe Length = 37.00 ft
Plan Length = 37.00 ft
Pipe Type = Circular
Pipe Dimensions = 24.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 14.40 cfs
Invert Elevation Downstream = 458.97 ft
Invert Elevation Upstream = 459.12 ft
Invert Slope = 0.42%
Invert Slope (Plan Length) = 0.41%
Rim Elevation Downstream = 465.73 ft
Rim Elevation Upstream = 465.72 ft
Natural Ground Slope = -0.03%
Crown Elevation Downstream = 460.97 ft
Crown Elevation Upstream = 461.12 ft

---FLOW INFORMATION---
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 20.76 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 20.76 cfs
Uniform Capacity = 14.40 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

---HYDRAULIC INFORMATION---
HGL Elevation Downstream = 463.41 ft
HGL Elevation Upstream = 464.06 ft
HGL Slope = 1.82 %
EGL Elevation Downstream = 464.09 ft
EGL Elevation Upstream = 464.74 ft
EGL Slope = 1.82 %
Critical Depth = 19.60 in
Depth Downstream = 24.00 in
Depth Upstream = 24.00 in
Velocity Downstream = 6.61 ft/s
Velocity Upstream = 6.61 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 3.14 ft^2
Area Upstream = 3.14 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = NA

---INLET INFORMATION---
Downstream Inlet = MH 2
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag
Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft

Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 4
—RAINFALL INFORMATION—
Return Period = 100 Year
Rainfall File = Tutorial

—PIPE INFORMATION—
Current Pipe = Pipe 4
Downstream Pipe = Pipe 1
Pipe Material = RCP
Pipe Length = 27.51 ft
Plan Length = 27.51 ft
Pipe Type = Circular
Pipe Dimensions = 18.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 59.76 cfs
Invert Elevation Downstream = 449.56 ft
Invert Elevation Upstream = 458.47 ft
Invert Slope = 38.75%
Invert Slope (Plan Length) = 32.39%
Rim Elevation Downstream = 461.92 ft
Rim Elevation Upstream = 462.08 ft
Natural Ground Slope = 0.58%
Crown Elevation Downstream = 451.06 ft
Crown Elevation Upstream = 459.97 ft

—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 6.51 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 6.51 cfs
Uniform Capacity = 59.76 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

—HYDRAULIC INFORMATION—
HGL Elevation Downstream = 457.12 ft
HGL Elevation Upstream = 459.68 ft
HGL Slope = 11.12 %

EGL Elevation Downstream = 457.33 ft
EGL Elevation Upstream = 460.11 ft
EGL Slope = 12.08 %
Critical Depth = 11.85 in
Depth Downstream = 18.00 in
Depth Upstream = 11.85 in
Velocity Downstream = 3.69 ft/s
Velocity Upstream = 5.28 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 1.77 ft^2
Area Upstream = 1.23 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = NA

—-INLET INFORMATION—-
Downstream Inlet = MH 1
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag
Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 5
—-RAINFALL INFORMATION—-
Return Period = 100 Year
Rainfall File = Tutorial

—-PIPE INFORMATION—-
Current Pipe = Pipe 5
Downstream Pipe = Pipe 1
Pipe Material = RCP
Pipe Length = 16.35 ft
Plan Length = 16.35 ft
Pipe Type = Circular
Pipe Dimensions = 18.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 69.72 cfs
Invert Elevation Downstream = 451.26 ft
Invert Elevation Upstream = 458.47 ft
Invert Slope = 54.86%
Invert Slope (Plan Length) = 44.10%
Rim Elevation Downstream = 461.92 ft
Rim Elevation Upstream = 462.02 ft
Natural Ground Slope = 0.61%
Crown Elevation Downstream = 452.76 ft
Crown Elevation Upstream = 459.97 ft

Storm Drain Line "B-1, B-2, B-3"

—FLOW INFORMATION—

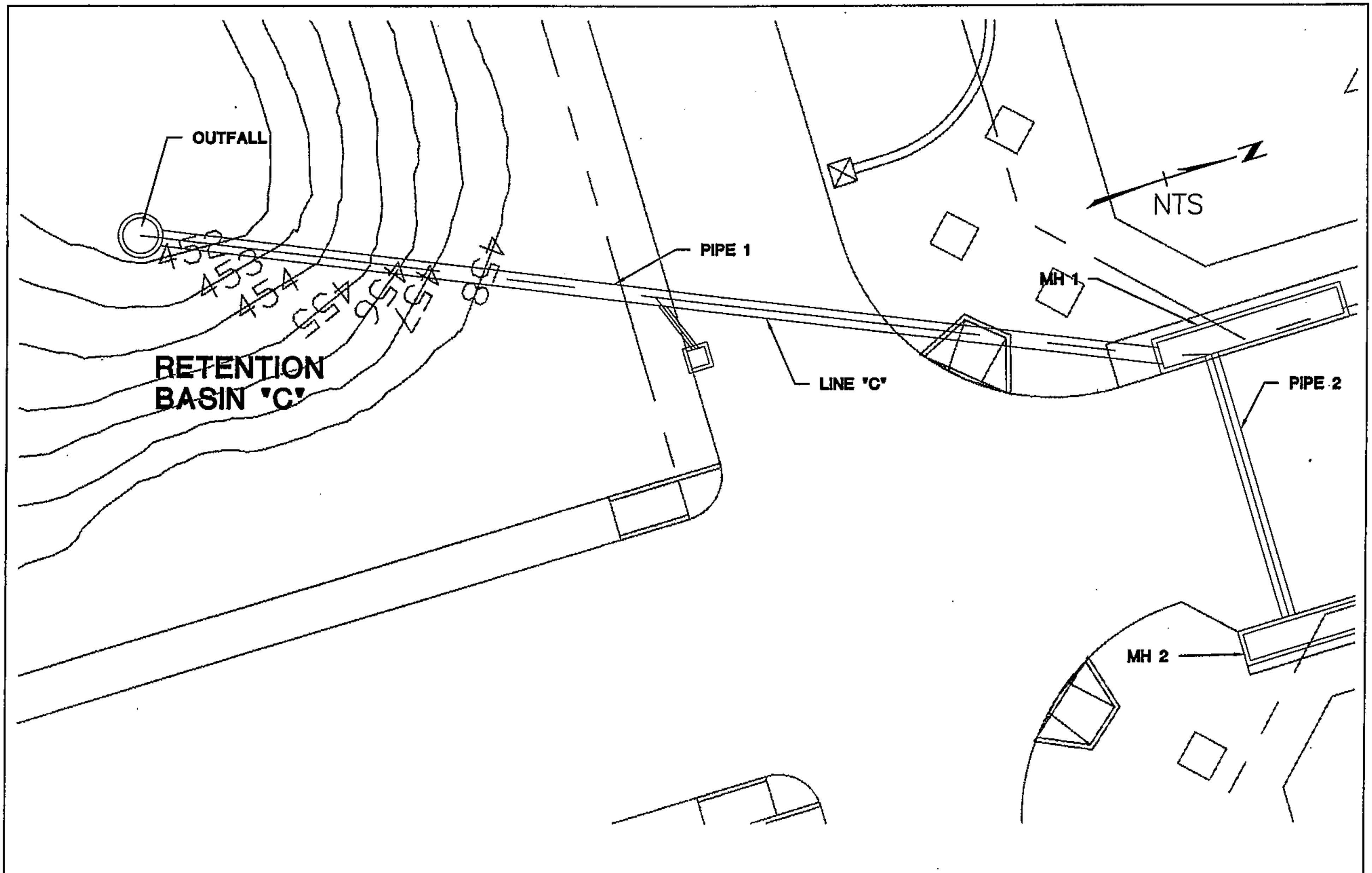
Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 6.51 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 6.51 cfs
Uniform Capacity	= 69.72 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 457.12 ft
HGL Elevation Upstream	= 459.67 ft
HGL Slope	= 19.44 %
EGL Elevation Downstream	= 457.33 ft
EGL Elevation Upstream	= 460.11 ft
EGL Slope	= 21.13 %
Critical Depth	= 11.85 in
Depth Downstream	= 18.00 in
Depth Upstream	= 11.85 in
Velocity Downstream	= 3.69 ft/s
Velocity Upstream	= 5.28 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 1.77 ft^2
Area Upstream	= 1.23 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= MH 1
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



STORM DRAIN LINE "C"

Storm Drain Line "C"

PIPE DESCRIPTION: Pipe 1

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= CONC
Pipe Length	= 113.10 ft
Plan Length	= 113.10 ft
Pipe Type	= Circular
Pipe Dimensions	= 24.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 40.23 cfs
Invert Elevation Downstream	= 447.75 ft
Invert Elevation Upstream	= 451.33 ft
Invert Slope	= 3.44%
Invert Slope (Plan Length)	= 3.17%
Rim Elevation Downstream	= 452.00 ft
Rim Elevation Upstream	= 458.41 ft
Natural Ground Slope	= 5.67%
Crown Elevation Downstream	= 449.75 ft
Crown Elevation Upstream	= 453.33 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 13.19 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.17 min
Total Intensity	= 12.98 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 26.37 cfs
Uniform Capacity	= 40.23 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 452.75 ft
HGL Elevation Upstream	= 454.29 ft
HGL Slope	= 1.48 %
EGL Elevation Downstream	= 453.85 ft
EGL Elevation Upstream	= 455.38 ft
EGL Slope	= 1.48 %
Critical Depth	= 21.54 in
Depth Downstream	= 24.00 in
Depth Upstream	= 24.00 in
Velocity Downstream	= 8.39 ft/s
Velocity Upstream	= 8.39 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.14 ft^2
Area Upstream	= 3.14 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.548 ft

—INLET INFORMATION—

Downstream Inlet	= Outfall
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag

Storm Drain Line "C"

Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 2
—RAINFALL INFORMATION—
Return Period = 100 Year
Rainfall File = Tutorial

—PIPE INFORMATION—
Current Pipe = Pipe 2
Downstream Pipe = Pipe 1
Pipe Material = RCP
Pipe Length = 31.00 ft
Plan Length = 31.00 ft
Pipe Type = Circular
Pipe Dimensions = 18.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 6.77 cfs
Invert Elevation Downstream = 452.06 ft
Invert Elevation Upstream = 452.19 ft
Invert Slope = 0.47%
Invert Slope (Plan Length) = 0.42%
Rim Elevation Downstream = 458.41 ft
Rim Elevation Upstream = 458.41 ft
Natural Ground Slope = 0.00%
Crown Elevation Downstream = 453.56 ft
Crown Elevation Upstream = 453.69 ft

—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 13.19 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 13.19 cfs
Uniform Capacity = 6.77 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

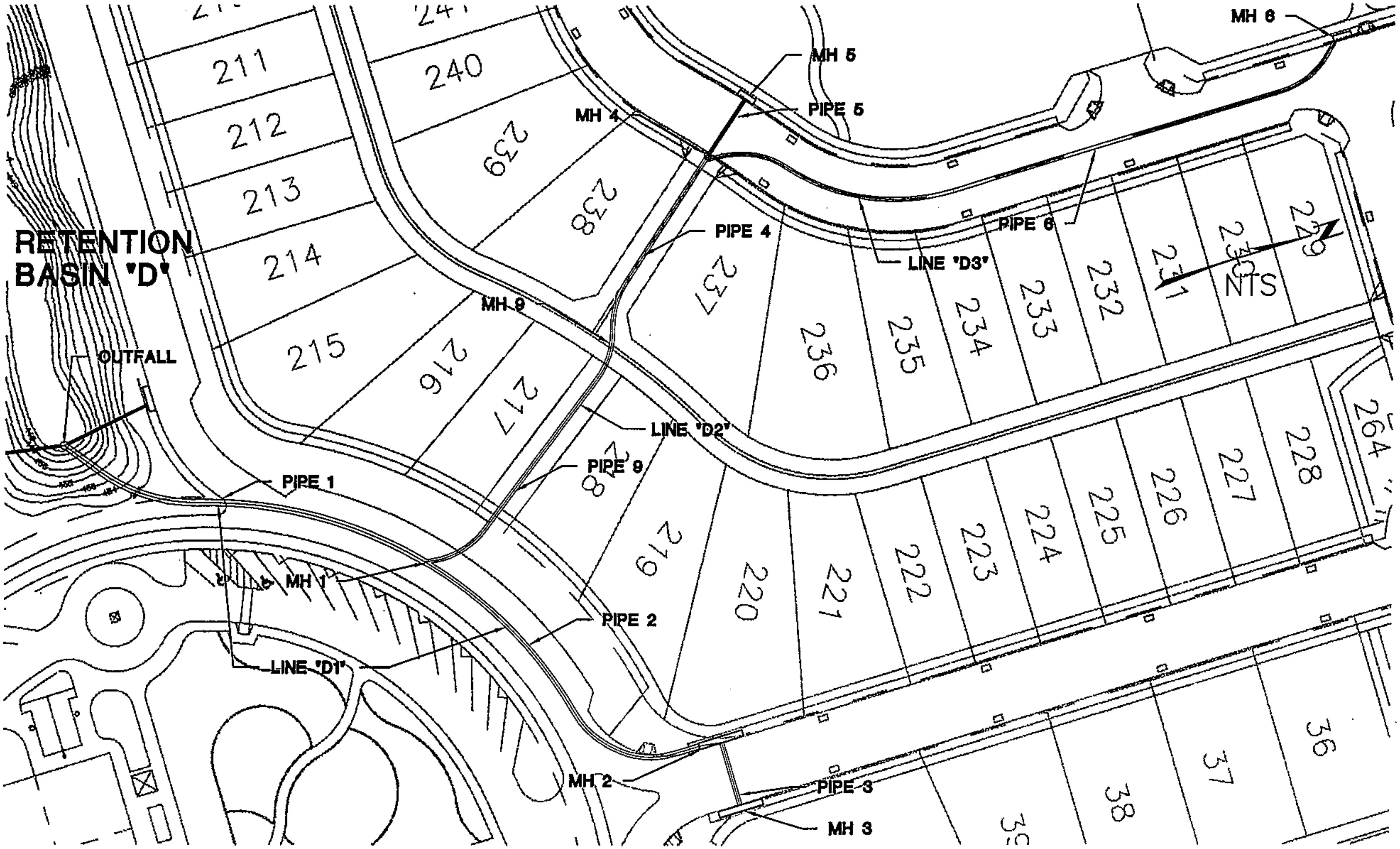
—HYDRAULIC INFORMATION—

Storm Drain Line "C"

HGL Elevation Downstream	= 454.84 ft
HGL Elevation Upstream	= 455.76 ft
HGL Slope	= 3.33 %
EGL Elevation Downstream	= 455.70 ft
EGL Elevation Upstream	= 456.62 ft
EGL Slope	= 3.33 %
Critical Depth	= 16.29 in
Depth Downstream	= 18.00 in
Depth Upstream	= 18.00 in
Velocity Downstream	= 7.46 ft/s
Velocity Upstream	= 7.46 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 1.77 ft^2
Area Upstream	= 1.77 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= MH 1
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



STORM DRAIN LINE "D1,D2,D3"

Storm Drain Line "D-1, D-2, D-3"

PIPE DESCRIPTION: Pipe 1

—RAINFALL INFORMATION—	
Return Period	= 100 Year
Rainfall File	= Tutorial
—PIPE INFORMATION—	
Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= CONC
Pipe Length	= 216.07 ft
Plan Length	= 216.07 ft
Pipe Type	= Circular
Pipe Dimensions	= 42.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 63.30 cfs
Invert Elevation Downstream	= 442.42 ft
Invert Elevation Upstream	= 443.28 ft
Invert Slope	= 0.41%
Invert Slope (Plan Length)	= 0.40%
Rim Elevation Downstream	= 447.00 ft
Rim Elevation Upstream	= 453.74 ft
Natural Ground Slope	= 3.12%
Crown Elevation Downstream	= 445.92 ft
Crown Elevation Upstream	= 446.78 ft
—FLOW INFORMATION—	
Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 2.97 min
Total Intensity	= 11.21 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 67.30 cfs
Uniform Capacity	= 63.30 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd
—HYDRAULIC INFORMATION—	
HGL Elevation Downstream	= 449.00 ft
HGL Elevation Upstream	= 449.97 ft
HGL Slope	= 0.46 %
EGL Elevation Downstream	= 449.76 ft
EGL Elevation Upstream	= 450.73 ft
EGL Slope	= 0.46 %
Critical Depth	= 30.87 in
Depth Downstream	= 42.00 in
Depth Upstream	= 42.00 in
Velocity Downstream	= 7.00 ft/s
Velocity Upstream	= 7.00 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 9.62 ft^2
Area Upstream	= 9.62 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.380 ft
—INLET INFORMATION—	
Downstream Inlet	= Outfall
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag

Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 2
---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 2
Downstream Pipe = Pipe 1
Pipe Material = CONC
Pipe Length = 194.96 ft
Plan Length = 194.96 ft
Pipe Type = Circular
Pipe Dimensions = 33.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 33.22 cfs
Invert Elevation Downstream = 444.07 ft
Invert Elevation Upstream = 444.84 ft
Invert Slope = 0.45%
Invert Slope (Plan Length) = 0.39%
Rim Elevation Downstream = 453.74 ft
Rim Elevation Upstream = 453.40 ft
Natural Ground Slope = -0.17%
Crown Elevation Downstream = 446.82 ft
Crown Elevation Upstream = 447.59 ft

---FLOW INFORMATION---
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 17.88 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.21 min
Total Intensity = 12.96 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 35.75 cfs
Uniform Capacity = 33.22 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

---HYDRAULIC INFORMATION---

Storm Drain Line "D-1, D-2, D-3"

HGL Elevation Downstream	= 450.35 ft
HGL Elevation Upstream	= 451.24 ft
HGL Slope	= 0.52 %
EGL Elevation Downstream	= 450.91 ft
EGL Elevation Upstream	= 451.80 ft
EGL Slope	= 0.52 %
Critical Depth	= 23.90 in
Depth Downstream	= 33.00 in
Depth Upstream	= 33.00 in
Velocity Downstream	= 6.02 ft/s
Velocity Upstream	= 6.02 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 5.94 ft^2
Area Upstream	= 5.94 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.282 ft

---INLET INFORMATION---

Downstream Inlet	= MH 1
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 3

---RAINFALL INFORMATION---

Return Period	= 100 Year
Rainfall File	= Tutorial

---PIPE INFORMATION---

Current Pipe	= Pipe 3
Downstream Pipe	= Pipe 2
Pipe Material	= CONC
Pipe Length	= 37.00 ft
Plan Length	= 37.00 ft
Pipe Type	= Circular
Pipe Dimensions	= 27.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 19.04 cfs
Invert Elevation Downstream	= 445.75 ft
Invert Elevation Upstream	= 445.89 ft
Invert Slope	= 0.41%
Invert Slope (Plan Length)	= 0.38%
Rim Elevation Downstream	= 453.40 ft
Rim Elevation Upstream	= 453.38 ft

Storm Drain Line "D-1, D-2, D-3"

Natural Ground Slope	= -0.05%
Crown Elevation Downstream	= 448.00 ft
Crown Elevation Upstream	= 448.14 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 17.88 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 17.88 cfs
Uniform Capacity	= 19.04 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 451.52 ft
HGL Elevation Upstream	= 451.80 ft
HGL Slope	= 0.82 %
EGL Elevation Downstream	= 451.83 ft
EGL Elevation Upstream	= 452.11 ft
EGL Slope	= 0.82 %
Critical Depth	= 17.73 in
Depth Downstream	= 27.00 in
Depth Upstream	= 27.00 in
Velocity Downstream	= 4.50 ft/s
Velocity Upstream	= 4.50 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.98 ft^2
Area Upstream	= 3.98 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= MH 2
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %

Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 9
---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 9
Downstream Pipe = Pipe 1
Pipe Material = CONC
Pipe Length = 166.71 ft
Plan Length = 166.71 ft
Pipe Type = Circular
Pipe Dimensions = 27.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 41.18 cfs
Invert Elevation Downstream = 444.02 ft
Invert Elevation Upstream = 446.97 ft
Invert Slope = 1.86%
Invert Slope (Plan Length) = 1.77%
Rim Elevation Downstream = 453.74 ft
Rim Elevation Upstream = 460.50 ft
Natural Ground Slope = 4.05%
Crown Elevation Downstream = 446.27 ft
Crown Elevation Upstream = 449.22 ft

---FLOW INFORMATION---
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 0.00 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 2.72 min
Total Intensity = 11.34 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 31.55 cfs
Uniform Capacity = 41.18 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

---HYDRAULIC INFORMATION---
HGL Elevation Downstream = 450.35 ft
HGL Elevation Upstream = 452.08 ft
HGL Slope = 1.09 %
EGL Elevation Downstream = 451.33 ft
EGL Elevation Upstream = 453.06 ft
EGL Slope = 1.09 %
Critical Depth = 23.24 in
Depth Downstream = 27.00 in
Depth Upstream = 27.00 in
Velocity Downstream = 7.93 ft/s
Velocity Upstream = 7.93 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 3.98 ft^2
Area Upstream = 3.98 ft^2
Kj (JLC) = 0.00
Calculated Junction Loss = 0.003 ft

---INLET INFORMATION---
Downstream Inlet = MH 1
Inlet Description = <None>
Inlet Type = Undefined
Computation Case = Sag

Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 4
—RAINFALL INFORMATION—
Return Period = 100 Year
Rainfall File = Tutorial

—PIPE INFORMATION—
Current Pipe = Pipe 4
Downstream Pipe = Pipe 9
Pipe Material = CONC
Pipe Length = 111.68 ft
Plan Length = 111.68 ft
Pipe Type = Circular
Pipe Dimensions = 27.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 60.81 cfs
Invert Elevation Downstream = 446.97 ft
Invert Elevation Upstream = 451.28 ft
Invert Slope = 3.86%
Invert Slope (Plan Length) = 3.86%
Rim Elevation Downstream = 460.50 ft
Rim Elevation Upstream = 459.28 ft
Natural Ground Slope = -1.09%
Crown Elevation Downstream = 449.22 ft
Crown Elevation Upstream = 453.53 ft

—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 0.00 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 2.10 min
Total Intensity = 11.69 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 31.55 cfs
Uniform Capacity = 60.81 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 452.08 ft
HGL Elevation Upstream	= 453.22 ft
HGL Slope	= 1.02 %
EGL Elevation Downstream	= 453.06 ft
EGL Elevation Upstream	= 454.38 ft
EGL Slope	= 1.19 %
Critical Depth	= 23.24 in
Depth Downstream	= 27.00 in
Depth Upstream	= 23.24 in
Velocity Downstream	= 7.93 ft/s
Velocity Upstream	= 8.67 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.98 ft^2
Area Upstream	= 3.64 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= 0.584 ft

---INLET INFORMATION---

Downstream Inlet	= MH 9
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 5
---RAINFALL INFORMATION---

Return Period	= 100 Year
Rainfall File	= Tutorial

---PIPE INFORMATION---

Current Pipe	= Pipe 5
Downstream Pipe	= Pipe 4
Pipe Material	= CONC
Pipe Length	= 35.76 ft
Plan Length	= 35.76 ft
Pipe Type	= Circular
Pipe Dimensions	= 21.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 37.56 cfs
Invert Elevation Downstream	= 451.88 ft
Invert Elevation Upstream	= 453.89 ft
Invert Slope	= 6.01%
Invert Slope (Plan Length)	= 5.63%
Rim Elevation Downstream	= 459.28 ft
Rim Elevation Upstream	= 458.65 ft

Storm Drain Line "D-1, D-2, D-3"

Natural Ground Slope = -1.76%
Crown Elevation Downstream = 453.63 ft
Crown Elevation Upstream = 455.64 ft

—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 11.66 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 11.66 cfs
Uniform Capacity = 37.56 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

—HYDRAULIC INFORMATION—
HGL Elevation Downstream = 453.80 ft
HGL Elevation Upstream = 455.47 ft
HGL Slope = 4.97 %
EGL Elevation Downstream = 454.17 ft
EGL Elevation Upstream = 456.07 ft
EGL Slope = 5.68 %
Critical Depth = 15.28 in
Depth Downstream = 21.00 in
Depth Upstream = 15.28 in
Velocity Downstream = 4.85 ft/s
Velocity Upstream = 6.22 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 2.41 ft^2
Area Upstream = 1.87 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = NA

—INLET INFORMATION—
Downstream Inlet = MH 4
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag
Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in
Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %

Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 6
---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 6
Downstream Pipe = Pipe 4
Pipe Material = CONC
Pipe Length = 378.79 ft
Plan Length = 378.79 ft
Pipe Type = Circular
Pipe Dimensions = 24.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 26.85 cfs
Invert Elevation Downstream = 451.51 ft
Invert Elevation Upstream = 456.85 ft
Invert Slope = 1.52%
Invert Slope (Plan Length) = 1.41%
Rim Elevation Downstream = 459.28 ft
Rim Elevation Upstream = 461.47 ft
Natural Ground Slope = 0.58%
Crown Elevation Downstream = 453.51 ft
Crown Elevation Upstream = 458.85 ft

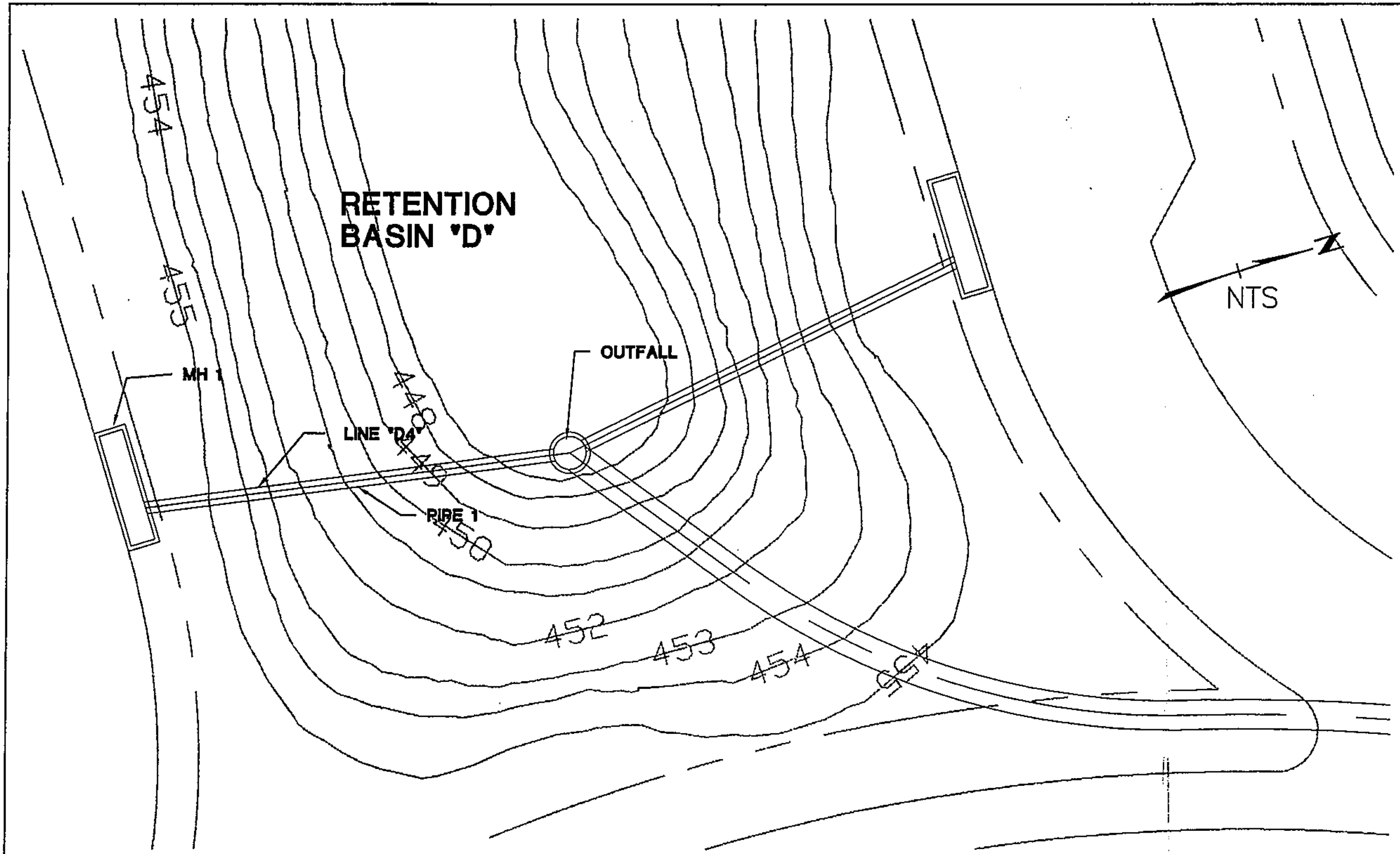
---FLOW INFORMATION---
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 19.89 cfs
Inlet Hydrograph Flow = 0.00 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 19.89 cfs
Uniform Capacity = 26.85 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

---HYDRAULIC INFORMATION---
HGL Elevation Downstream = 453.80 ft
HGL Elevation Upstream = 458.87 ft
HGL Slope = 1.44 %
EGL Elevation Downstream = 454.42 ft
EGL Elevation Upstream = 459.72 ft
EGL Slope = 1.51 %
Critical Depth = 19.23 in
Depth Downstream = 24.00 in
Depth Upstream = 19.23 in
Velocity Downstream = 6.33 ft/s
Velocity Upstream = 7.37 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 3.14 ft^2
Area Upstream = 2.70 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = NA

---INLET INFORMATION---
Downstream Inlet = MH 4
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag

Storm Drain Line "D-1, D-2, D-3"

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



STORM DRAIN LINE "D4"

Storm Drain Line "D-4"

PIPE DESCRIPTION: Pipe 1
—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= RCP
Pipe Length	= 50.19 ft
Plan Length	= 50.19 ft
Pipe Type	= Circular
Pipe Dimensions	= 18.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 44.21 cfs
Invert Elevation Downstream	= 442.07 ft
Invert Elevation Upstream	= 450.97 ft
Invert Slope	= 17.81%
Invert Slope (Plan Length)	= 17.73%
Rim Elevation Downstream	= 447.00 ft
Rim Elevation Upstream	= 454.71 ft
Natural Ground Slope	= 15.36%
Crown Elevation Downstream	= 443.57 ft
Crown Elevation Upstream	= 452.47 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 9.52 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 9.52 cfs
Uniform Capacity	= 44.21 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

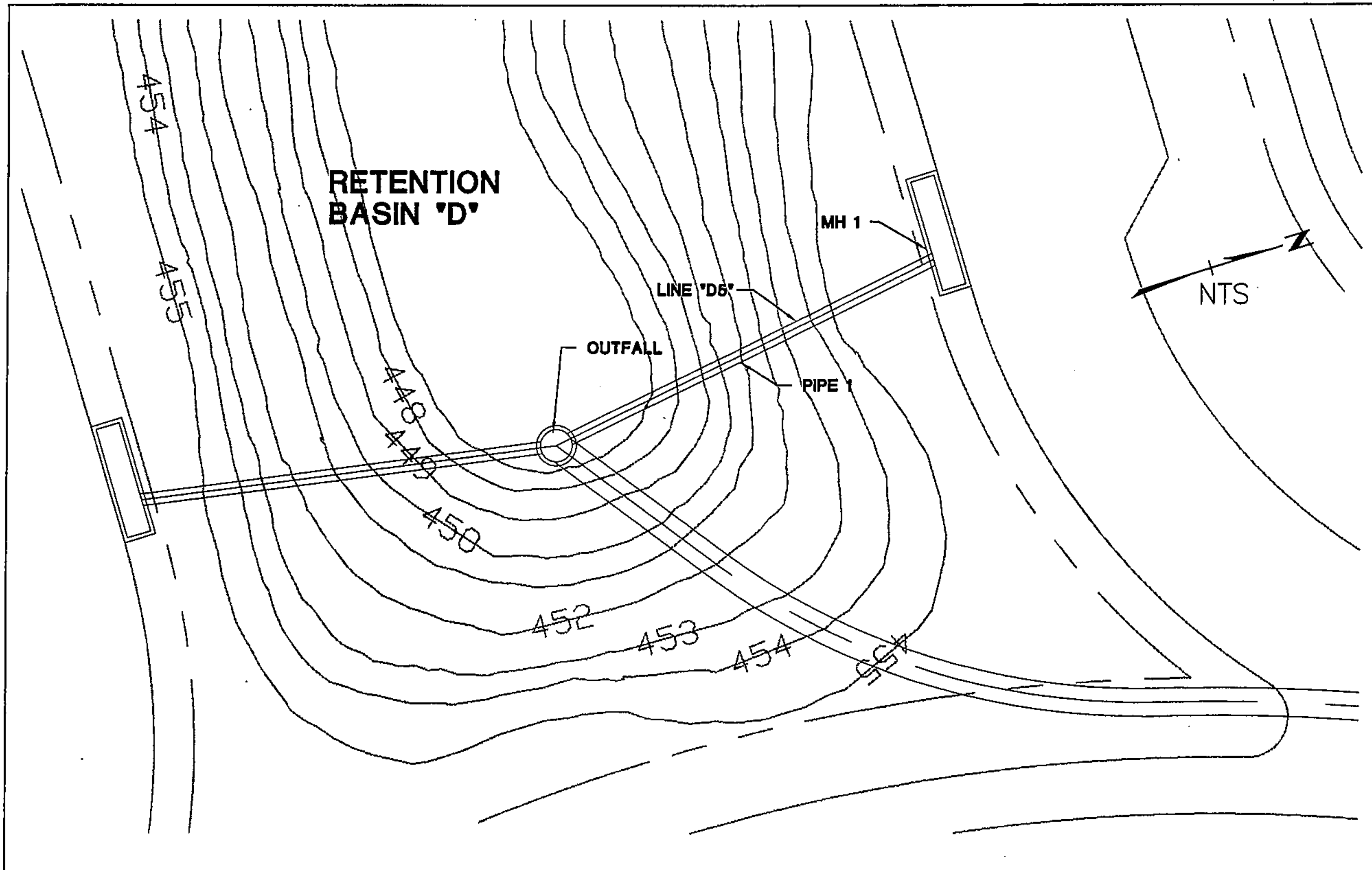
HGL Elevation Downstream	= 449.00 ft
HGL Elevation Upstream	= 452.47 ft
HGL Slope	= 6.95 %
EGL Elevation Downstream	= 449.45 ft
EGL Elevation Upstream	= 453.10 ft
EGL Slope	= 7.29 %
Critical Depth	= 14.30 in
Depth Downstream	= 18.00 in
Depth Upstream	= 14.30 in
Velocity Downstream	= 5.39 ft/s
Velocity Upstream	= 6.32 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 1.77 ft^2
Area Upstream	= 1.51 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= Outfall
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag

Storm Drain Line "D-4"

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



STORM DRAIN LINE "D5"

Storm Drain Line "D-5"

PIPE DESCRIPTION: Pipe 1

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= RCP
Pipe Length	= 50.19 ft
Plan Length	= 50.19 ft
Pipe Type	= Circular
Pipe Dimensions	= 18.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 46.77 cfs
Invert Elevation Downstream	= 440.92 ft
Invert Elevation Upstream	= 450.88 ft
Invert Slope	= 19.93%
Invert Slope (Plan Length)	= 19.84%
Rim Elevation Downstream	= 447.00 ft
Rim Elevation Upstream	= 454.71 ft
Natural Ground Slope	= 15.36%
Crown Elevation Downstream	= 442.42 ft
Crown Elevation Upstream	= 452.38 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 10.66 cfs
Inlet Hydrograph Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.00 min
Total Intensity	= 13.11 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 10.66 cfs
Uniform Capacity	= 46.77 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

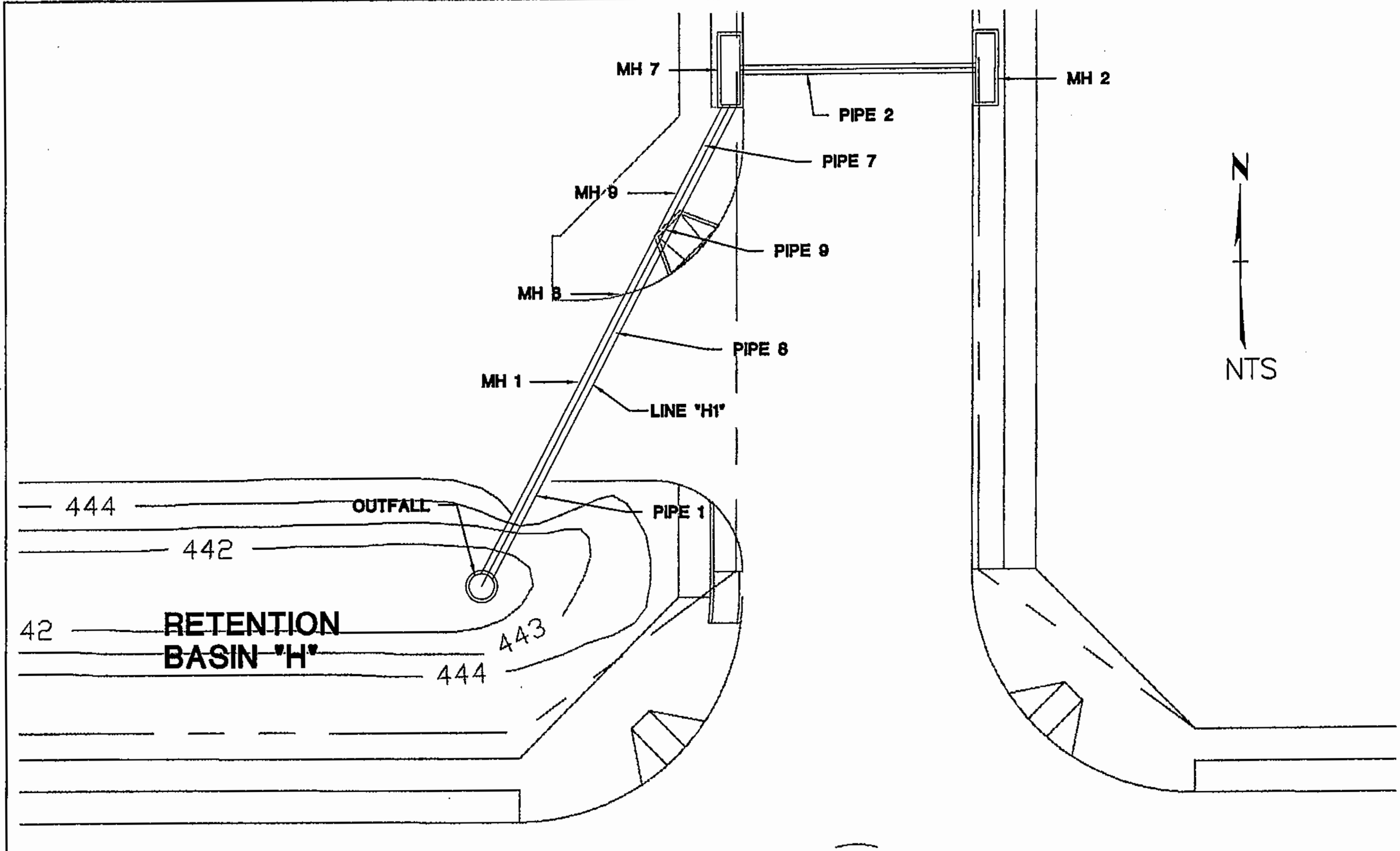
HGL Elevation Downstream	= 449.00 ft
HGL Elevation Upstream	= 452.49 ft
HGL Slope	= 6.98 %
EGL Elevation Downstream	= 449.57 ft
EGL Elevation Upstream	= 453.20 ft
EGL Slope	= 7.27 %
Critical Depth	= 15.04 in
Depth Downstream	= 18.00 in
Depth Upstream	= 15.04 in
Velocity Downstream	= 6.03 ft/s
Velocity Upstream	= 6.76 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 1.77 ft^2
Area Upstream	= 1.58 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= Outfall
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag

Storm Drain Line "D-5"

Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %



NOTE: MANHOLES 1, 8 AND 9 ARE
PIPE DEFLECTIONS.

STORM DRAIN LINE "H1"

Storm Drain Line "H1"

PIPE DESCRIPTION: Pipe 1

---RAINFALL INFORMATION---

Return Period	= 100 Year
Rainfall File	= Tutorial

---PIPE INFORMATION---

Current Pipe	= Pipe 1
Downstream Pipe	= Outfall
Pipe Material	= CONC
Pipe Length	= 40.19 ft
Plan Length	= 40.19 ft
Pipe Type	= Circular
Pipe Dimensions	= 24.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 14.30 cfs
Invert Elevation Downstream	= 435.57 ft
Invert Elevation Upstream	= 435.73 ft
Invert Slope	= 0.41%
Invert Slope (Plan Length)	= 0.40%
Rim Elevation Downstream	= 442.00 ft
Rim Elevation Upstream	= 448.90 ft
Natural Ground Slope	= 17.17%
Crown Elevation Downstream	= 437.57 ft
Crown Elevation Upstream	= 437.73 ft

---FLOW INFORMATION---

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.25 min
Total Intensity	= 12.92 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 17.87 cfs
Uniform Capacity	= 14.30 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

---HYDRAULIC INFORMATION---

HGL Elevation Downstream	= 444.32 ft
HGL Elevation Upstream	= 444.57 ft
HGL Slope	= 0.64 %
EGL Elevation Downstream	= 444.82 ft
EGL Elevation Upstream	= 445.07 ft
EGL Slope	= 0.64 %
Critical Depth	= 18.28 in
Depth Downstream	= 24.00 in
Depth Upstream	= 24.00 in
Velocity Downstream	= 5.69 ft/s
Velocity Upstream	= 5.69 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.14 ft^2
Area Upstream	= 3.14 ft^2
Kj (JLC)	= 0.01
Calculated Junction Loss	= 0.003 ft

---INLET INFORMATION---

Downstream Inlet	= Outfall
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000

Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 8

—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 8
Downstream Pipe	= Pipe 1
Pipe Material	= CONC
Pipe Length	= 12.01 ft
Plan Length	= 12.01 ft
Pipe Type	= Circular
Pipe Dimensions	= 24.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 41.27 cfs
Invert Elevation Downstream	= 435.73 ft
Invert Elevation Upstream	= 436.13 ft
Invert Slope	= 3.33%
Invert Slope (Plan Length)	= 3.33%
Rim Elevation Downstream	= 448.90 ft
Rim Elevation Upstream	= 448.90 ft
Natural Ground Slope	= 0.00%
Crown Elevation Downstream	= 437.73 ft
Crown Elevation Upstream	= 438.13 ft

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.24 min
Total Intensity	= 12.93 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 17.87 cfs
Uniform Capacity	= 41.27 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 444.57 ft
HGL Elevation Upstream	= 444.65 ft
HGL Slope	= 0.62 %

Storm Drain Line "H1"

EGL Elevation Downstream	= 445.08 ft
EGL Elevation Upstream	= 445.15 ft
EGL Slope	= 0.62 %
Critical Depth	= 18.28 in
Depth Downstream	= 24.00 in
Depth Upstream	= 24.00 in
Velocity Downstream	= 5.69 ft/s
Velocity Upstream	= 5.69 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.14 ft^2
Area Upstream	= 3.14 ft^2
Kj (JLC)	= 0.01
Calculated Junction Loss	= 0.003 ft

—INLET INFORMATION—

Downstream Inlet	= MH 1
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 9
—RAINFALL INFORMATION—

Return Period	= 100 Year
Rainfall File	= Tutorial

—PIPE INFORMATION—

Current Pipe	= Pipe 9
Downstream Pipe	= Pipe 8
Pipe Material	= CONC
Pipe Length	= 12.01 ft
Plan Length	= 12.01 ft
Pipe Type	= Circular
Pipe Dimensions	= 24.00 in
Pipe Manning's "n"	= 0.013
Pipe Capacity at Invert Slope	= 56.13 cfs
Invert Elevation Downstream	= 436.13 ft
Invert Elevation Upstream	= 436.87 ft
Invert Slope	= 5.28%
Invert Slope (Plan Length)	= 6.16%
Rim Elevation Downstream	= 448.90 ft
Rim Elevation Upstream	= 448.35 ft
Natural Ground Slope	= -4.58%
Crown Elevation Downstream	= 438.13 ft
Crown Elevation Upstream	= 438.87 ft

Storm Drain Line "H1"

—FLOW INFORMATION—

Catchment Area	= 0.00 ac
Runoff Coefficient	= 0.500
Inlet Time	= 0.00 min
Inlet Intensity	= 0.00 in/hr
Inlet Rational Flow	= 0.00 cfs
Inlet Input Flow	= 0.00 cfs
Total Area	= 0.00 ac
Weighted Coefficient	= 0.500
Total Time of Concentration	= 0.22 min
Total Intensity	= 12.94 in/hr
Total Rational Flow	= 0.00 cfs
Total Flow	= 17.87 cfs
Uniform Capacity	= 56.13 cfs
Skipped flow	= 0.00 cfs
Infiltration	= 0.00 gpd

—HYDRAULIC INFORMATION—

HGL Elevation Downstream	= 444.65 ft
HGL Elevation Upstream	= 444.73 ft
HGL Slope	= 0.54 %
EGL Elevation Downstream	= 445.15 ft
EGL Elevation Upstream	= 445.23 ft
EGL Slope	= 0.54 %
Critical Depth	= 18.28 in
Depth Downstream	= 24.00 in
Depth Upstream	= 24.00 in
Velocity Downstream	= 5.69 ft/s
Velocity Upstream	= 5.69 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 3.14 ft^2
Area Upstream	= 3.14 ft^2
Kj (JLC)	= 0.01
Calculated Junction Loss	= 0.003 ft

—INLET INFORMATION—

Downstream Inlet	= MH 8
Inlet Description	= <None>
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

PIPE DESCRIPTION: Pipe 7
—RAINFALL INFORMATION—

Storm Drain Line "H1"

Return Period = 100 Year
Rainfall File = Tutorial

—PIPE INFORMATION—
Current Pipe = Pipe 7
Downstream Pipe = Pipe 9
Pipe Material = CONC
Pipe Length = 18.62 ft
Plan Length = 18.62 ft
Pipe Type = Circular
Pipe Dimensions = 24.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 68.33 cfs
Invert Elevation Downstream = 436.87 ft
Invert Elevation Upstream = 438.57 ft
Invert Slope = 14.03%
Invert Slope (Plan Length) = 9.13%
Rim Elevation Downstream = 448.35 ft
Rim Elevation Upstream = 446.90 ft
Natural Ground Slope = -7.79%
Crown Elevation Downstream = 438.87 ft
Crown Elevation Upstream = 440.57 ft

—FLOW INFORMATION—
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 8.94 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.21 min
Total Intensity = 12.96 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 17.87 cfs
Uniform Capacity = 68.33 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

—HYDRAULIC INFORMATION—
HGL Elevation Downstream = 444.73 ft
HGL Elevation Upstream = 444.85 ft
HGL Slope = 0.96 %
EGL Elevation Downstream = 445.23 ft
EGL Elevation Upstream = 445.35 ft
EGL Slope = 0.96 %
Critical Depth = 18.28 in
Depth Downstream = 24.00 in
Depth Upstream = 24.00 in
Velocity Downstream = 5.69 ft/s
Velocity Upstream = 5.69 ft/s
Uniform Velocity Downstream = NA
Uniform Velocity Upstream = NA
Area Downstream = 3.14 ft^2
Area Upstream = 3.14 ft^2
Kj (JLC) = 0.50
Calculated Junction Loss = 0.252 ft

—INLET INFORMATION—
Downstream Inlet = MH 9
Inlet Description = Grate 19-3/8x17-3/4
Inlet Type = Undefined
Computation Case = Sag
Longitudinal Slope = 0.00 ft/ft
Mannings n-value = 0.000
Pavement Cross-Slope = 0.00 ft/ft
Gutter Cross-Slope = 0.00 ft/ft
Gutter Local Depression = 0.00 in

Storm Drain Line "H1"

Gutter Width = 0.00 ft
Ponding Width = 0.00 ft
Intercept Efficiency = * %
Flow from Catchment = 0.00 cfs
Carryover from previous inlet = 0.00 cfs
Total Flow to Current Inlet = 0.00 cfs
Flow Intercepted by Current Inlet = 0.00 cfs
Bypassed Flow = 0.00 cfs
Pavement Flow = 0.00 cfs
Gutter Flow = 0.00 cfs
Depth at Curb = 0.00 in
Depth at Pavement/Gutter Joint = 0.00 in
Pavement Spread = 0.00 ft
Total Spread = 0.00 ft
Gutter Velocity = 0.00 ft/s
Curb Efficiency = * %
Grate Efficiency = * %
Slot Efficiency = * %
Total Efficiency = 0.00 %

PIPE DESCRIPTION: Pipe 2
---RAINFALL INFORMATION---
Return Period = 100 Year
Rainfall File = Tutorial

---PIPE INFORMATION---
Current Pipe = Pipe 2
Downstream Pipe = Pipe 7
Pipe Material = RCP
Pipe Length = 37.00 ft
Plan Length = 37.00 ft
Pipe Type = Circular
Pipe Dimensions = 18.00 in
Pipe Manning's "n" = 0.013
Pipe Capacity at Invert Slope = 30.14 cfs
Invert Elevation Downstream = 439.43 ft
Invert Elevation Upstream = 442.47 ft
Invert Slope = 8.28%
Invert Slope (Plan Length) = 8.24%
Rim Elevation Downstream = 446.90 ft
Rim Elevation Upstream = 446.90 ft
Natural Ground Slope = 0.00%
Crown Elevation Downstream = 440.93 ft
Crown Elevation Upstream = 443.97 ft

---FLOW INFORMATION---
Catchment Area = 0.00 ac
Runoff Coefficient = 0.500
Inlet Time = 0.00 min
Inlet Intensity = 0.00 in/hr
Inlet Rational Flow = 0.00 cfs
Inlet Input Flow = 8.94 cfs
Total Area = 0.00 ac
Weighted Coefficient = 0.500
Total Time of Concentration = 0.00 min
Total Intensity = 13.11 in/hr
Total Rational Flow = 0.00 cfs
Total Flow = 8.94 cfs
Uniform Capacity = 30.14 cfs
Skipped flow = 0.00 cfs
Infiltration = 0.00 gpd

---HYDRAULIC INFORMATION---
HGL Elevation Downstream = 445.10 ft
HGL Elevation Upstream = 445.56 ft
HGL Slope = 1.27 %
EGL Elevation Downstream = 445.49 ft
EGL Elevation Upstream = 445.96 ft
EGL Slope = 1.27 %

Critical Depth	= 13.88 in
Depth Downstream	= 18.00 in
Depth Upstream	= 18.00 in
Velocity Downstream	= 5.06 ft/s
Velocity Upstream	= 5.06 ft/s
Uniform Velocity Downstream	= NA
Uniform Velocity Upstream	= NA
Area Downstream	= 1.77 ft^2
Area Upstream	= 1.77 ft^2
Kj (JLC)	= 0.50
Calculated Junction Loss	= NA

—INLET INFORMATION—

Downstream Inlet	= MH 7
Inlet Description	= Grate 19-3/8x17-3/4
Inlet Type	= Undefined
Computation Case	= Sag
Longitudinal Slope	= 0.00 ft/ft
Mannings n-value	= 0.000
Pavement Cross-Slope	= 0.00 ft/ft
Gutter Cross-Slope	= 0.00 ft/ft
Gutter Local Depression	= 0.00 in
Gutter Width	= 0.00 ft
Ponding Width	= 0.00 ft
Intercept Efficiency	= * %
Flow from Catchment	= 0.00 cfs
Carryover from previous inlet	= 0.00 cfs
Total Flow to Current Inlet	= 0.00 cfs
Flow Intercepted by Current Inlet	= 0.00 cfs
Bypassed Flow	= 0.00 cfs
Pavement Flow	= 0.00 cfs
Gutter Flow	= 0.00 cfs
Depth at Curb	= 0.00 in
Depth at Pavement/Gutter Joint	= 0.00 in
Pavement Spread	= 0.00 ft
Total Spread	= 0.00 ft
Gutter Velocity	= 0.00 ft/s
Curb Efficiency	= * %
Grate Efficiency	= * %
Slot Efficiency	= * %
Total Efficiency	= 0.00 %

Catch Basin Calculations

TRACT 28639-1 RIO VISTA VILLAG

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

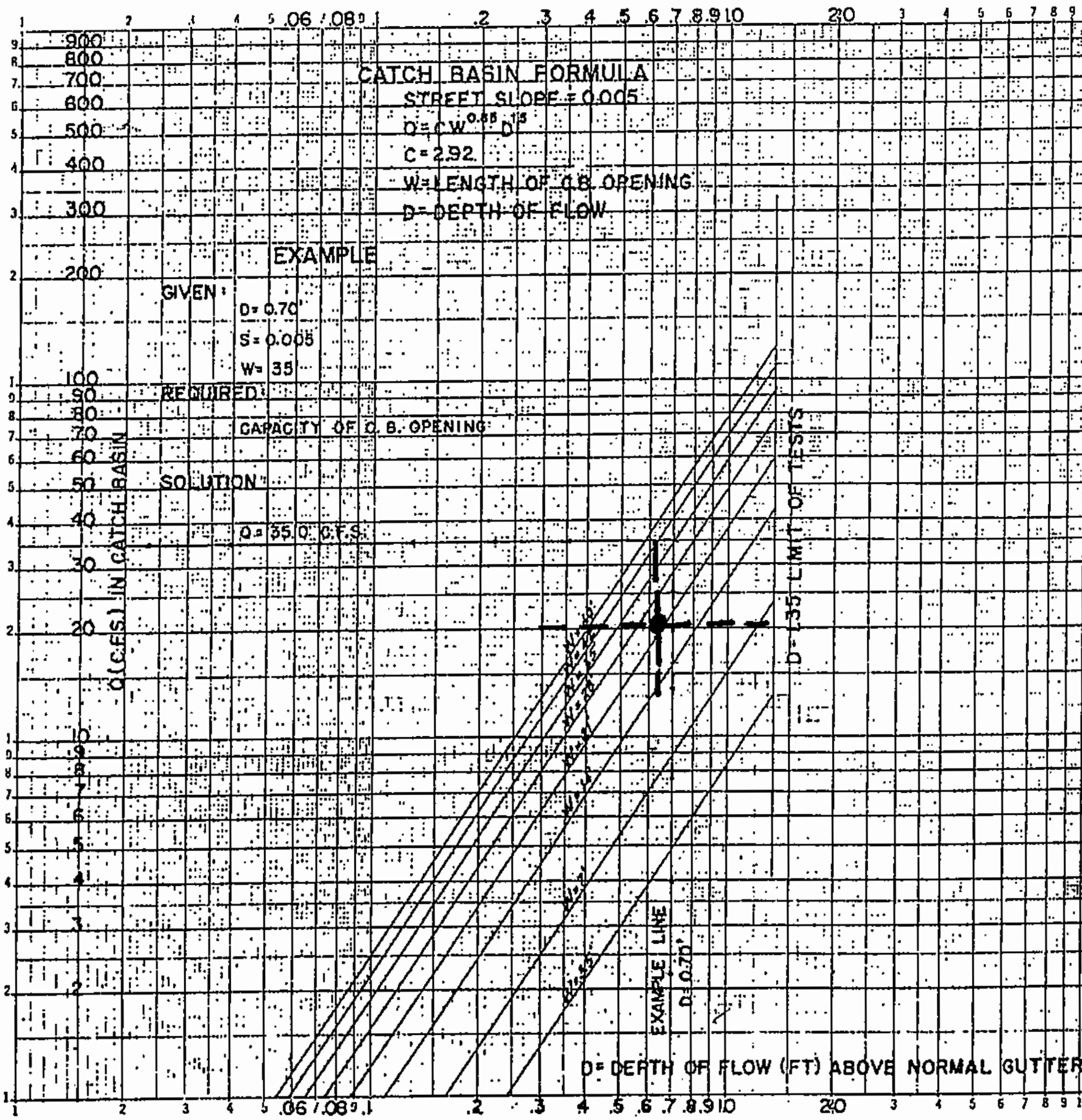
STA: 23+53.50 (E) RIO GUADALUPE

D = 0.63 W = 22.71

Q = 20.76 USE: W = 24

LINE: B-1, MH 2

OFFICE STANDARD NO 108



NOTES:

1. THIS CHART GIVES CAPACITIES AS DEVELOPED FROM EXPERIMENTAL HYDRAULIC MODEL STUDIES FOR CATCH BASIN NO 40 TYPE CURB OPENINGS WITH STANDARD LOCAL DEPRESSIONS, AND MAY BE USED IN DETERMINING THE LENGTH ("W") AND/OR THE CAPACITY ("Q") OF BASIN OPENINGS OF THIS TYPE UNDER VARIOUS VALUES OF "D".

2. THIS CHART IS APPLICABLE ONLY TO CONDITIONS SHOWN ON FIGURE 2.

C.B. NO 40 TYPE CURB OPENING

DESIGN CHART LL-13

SIDE-OPENING CATCH BASIN CAPACITIES

BUREAU OF ENGINEERING - CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
STORM DRAIN DESIGN DIVISION

W.O. 31212		MARCH 1956
DESIGN: F.J.D. 3-[illegible]-55		DRAWN: O.G.S. 3-18-55

TRACT 28639-1 RIO VISTA VILLA

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[\frac{Q}{2.92\, D^{1.5}} \right]^{1.17647}$

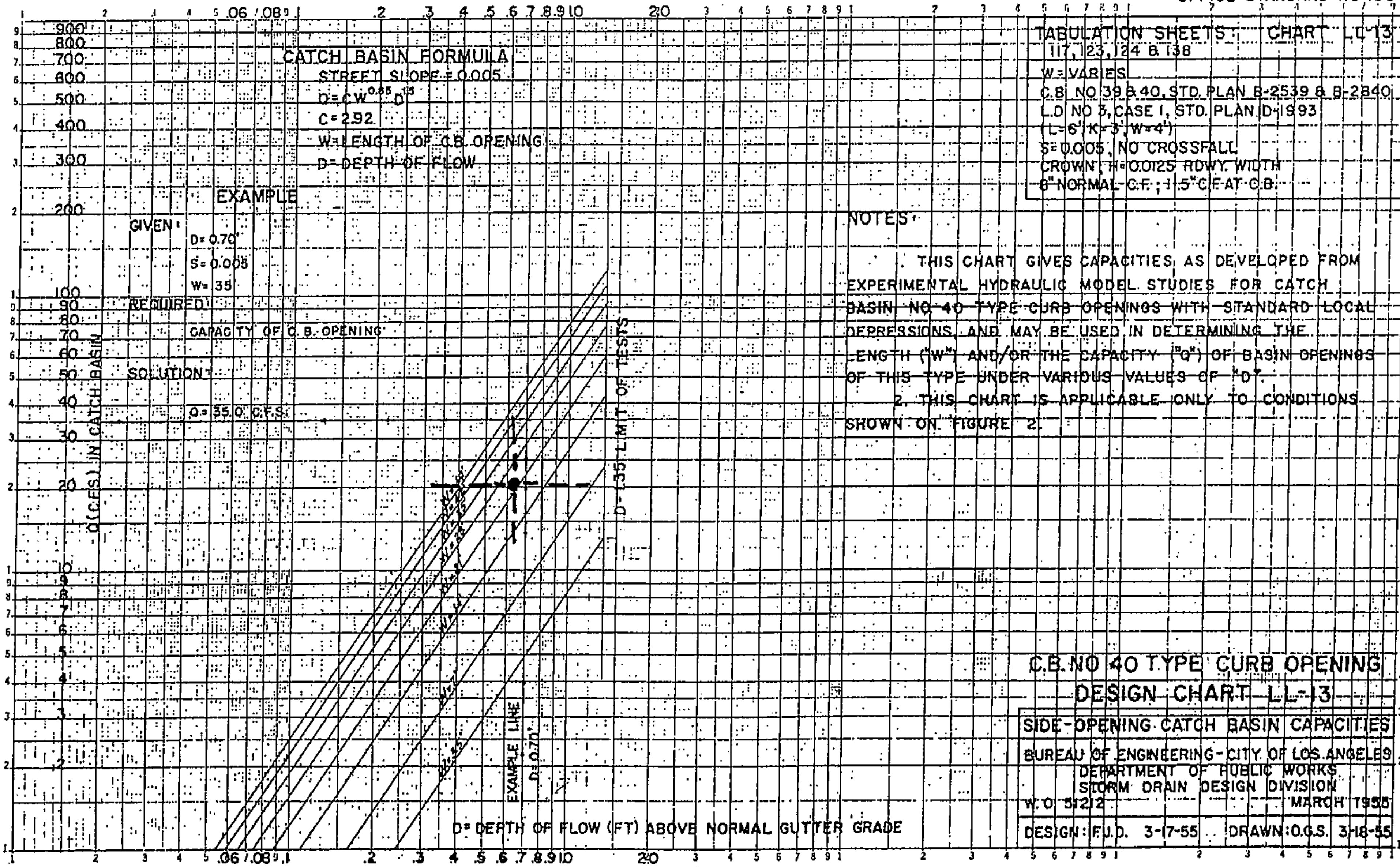
STA: 23+53.50 (W) RIO GUADALUPE

D = 0.63' W = 22.71

Q = 20.76 USE: W = 24'

LINE: B-1, MH 3

OFFICE STANDARD NO 108



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

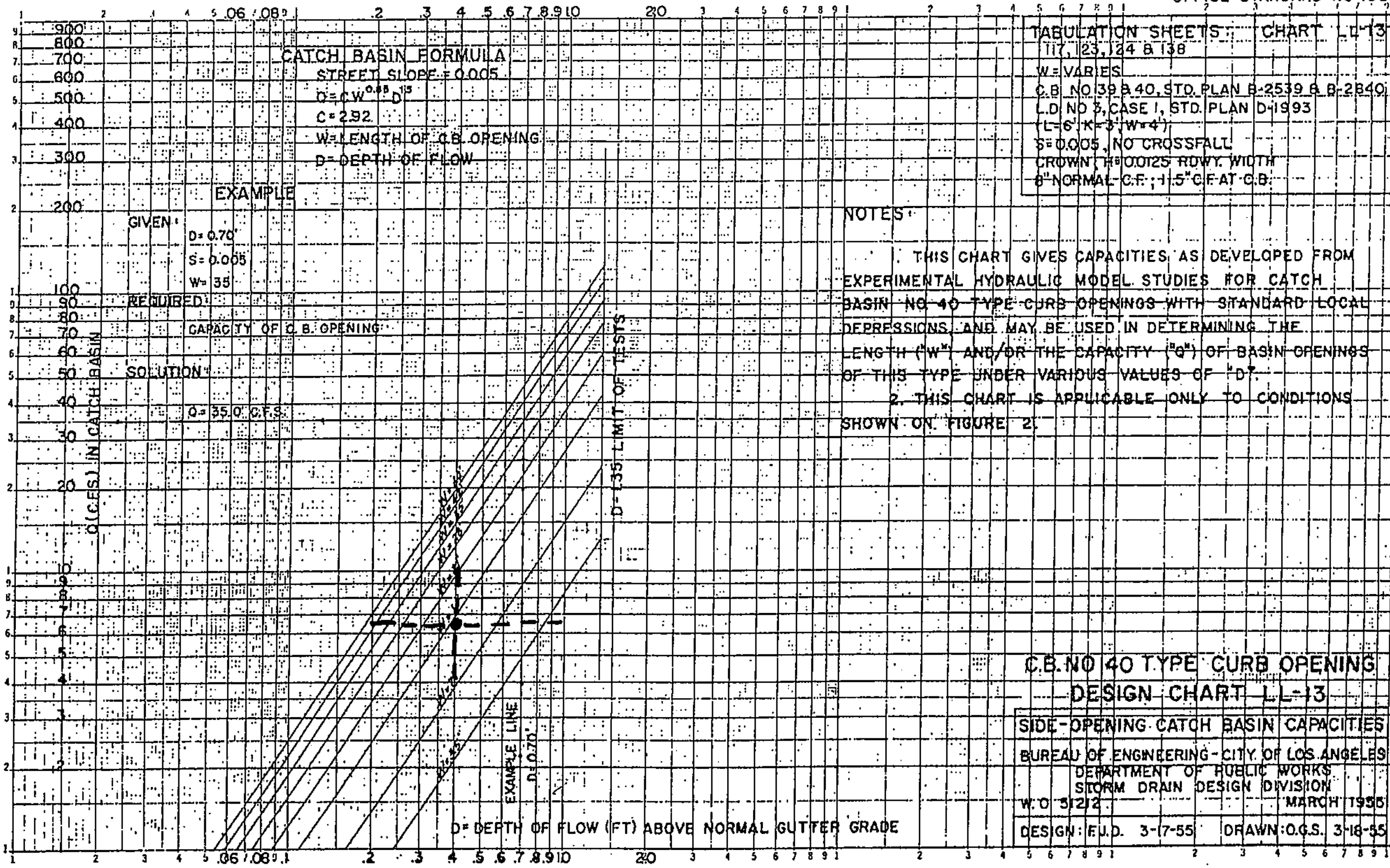
STA: 20+54.00 (W) RIO GUADALUPE

D = 0.41' W = 12.40'

Q = 6.515 USE: W = 13'

LINE: B-2, MH 4

OFFICE STANDARD NO 108



TRACT 28639-1 RIO VISTA VILLAG

CATCH BASIN CAPACITY CHARTS

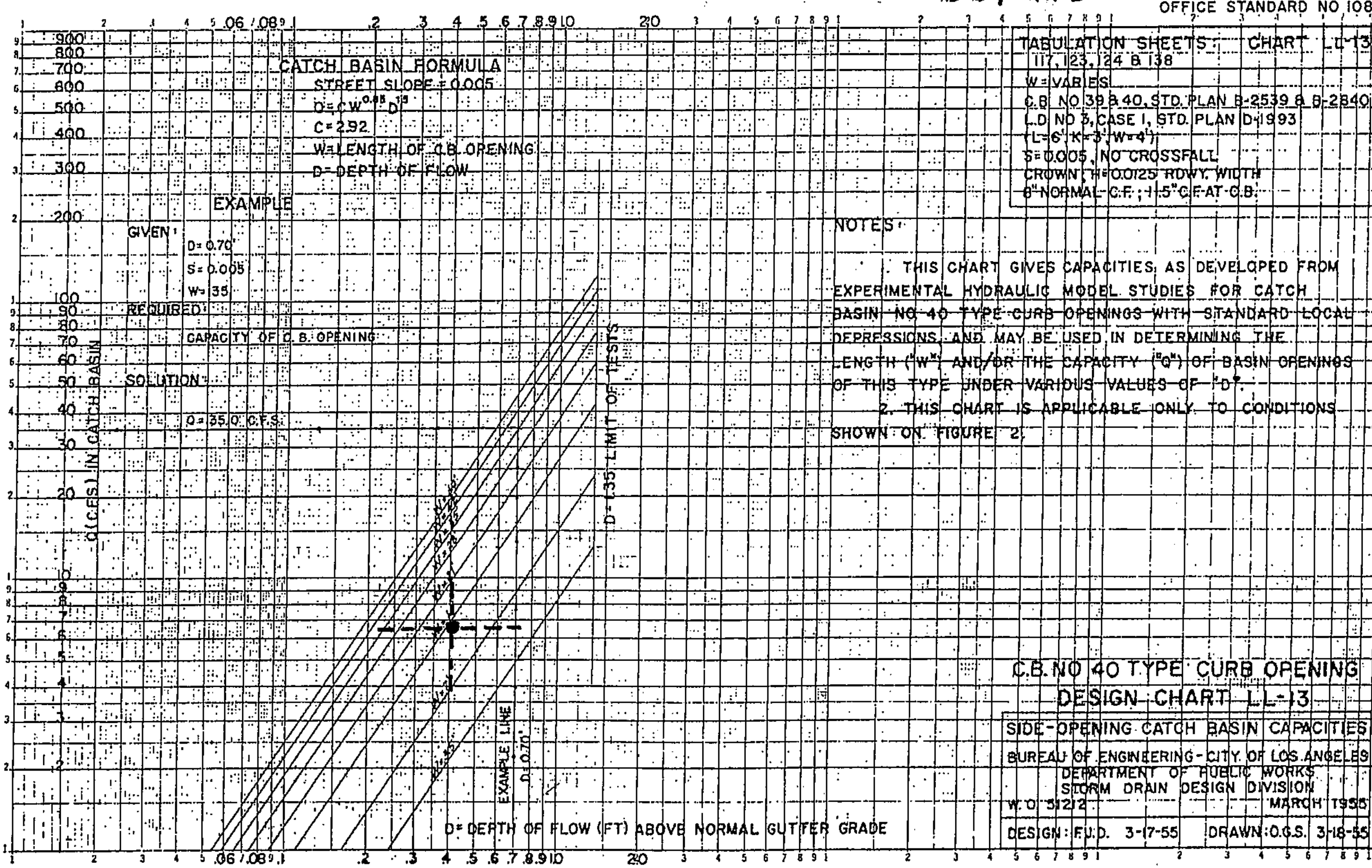
ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

STA: 20+5400(E) RIO GUADALUPE

D= 0.41 W= 12.40

Q= 6.515 USE: W= 13'

LINE: B-3, MH 5



TRACT 28639-1 RIO VISTA VILLA

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[Q / 2.92 D^{1.5} \right]^{1.17647}$

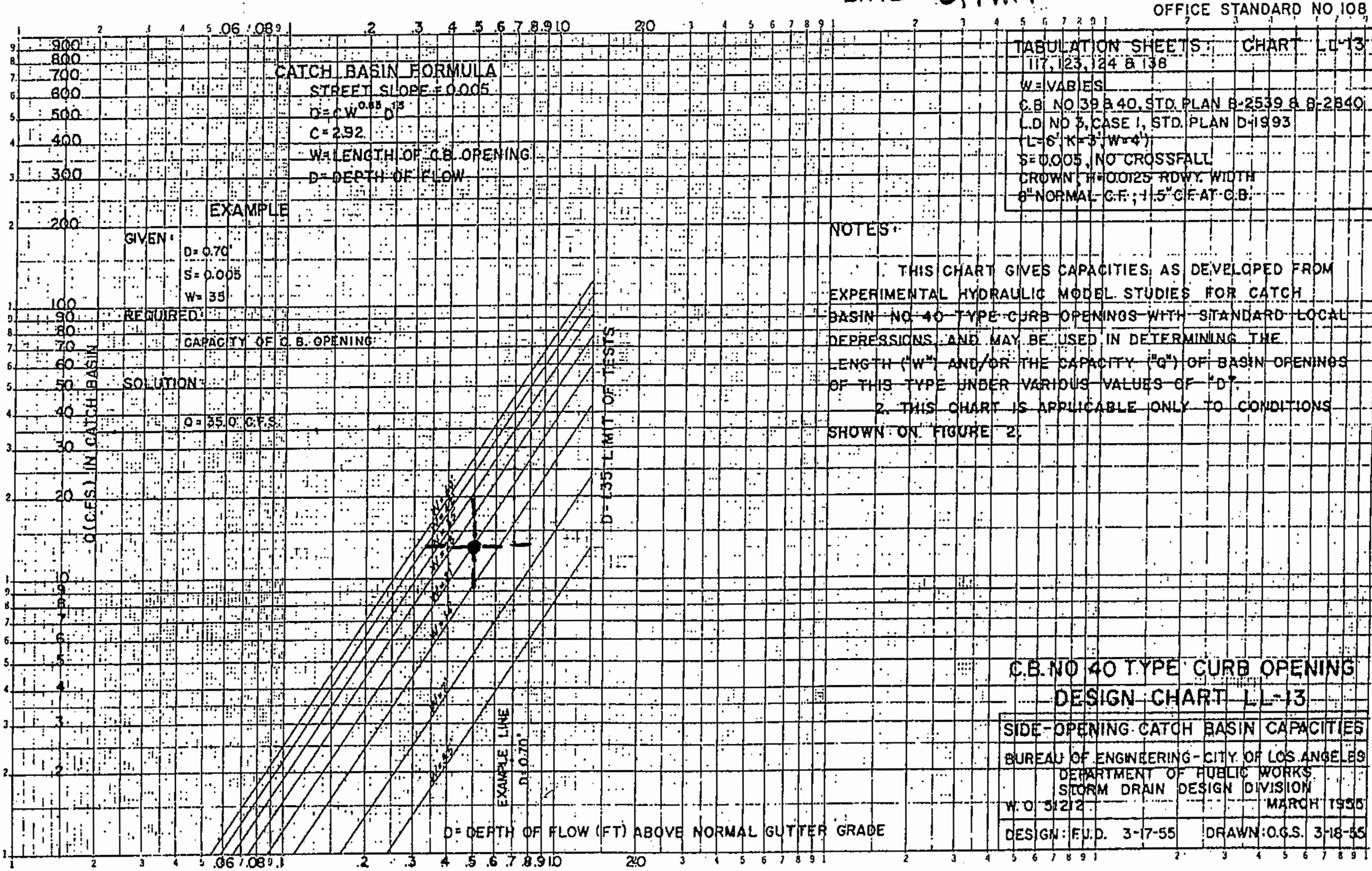
STA: 14+69.00 (W) RIO FELICIA

D = 0.49' W = 20.75'

Q = 13.185 USE: W = 21'

LINE: C, MH 1

OFFICE STANDARD NO 108



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

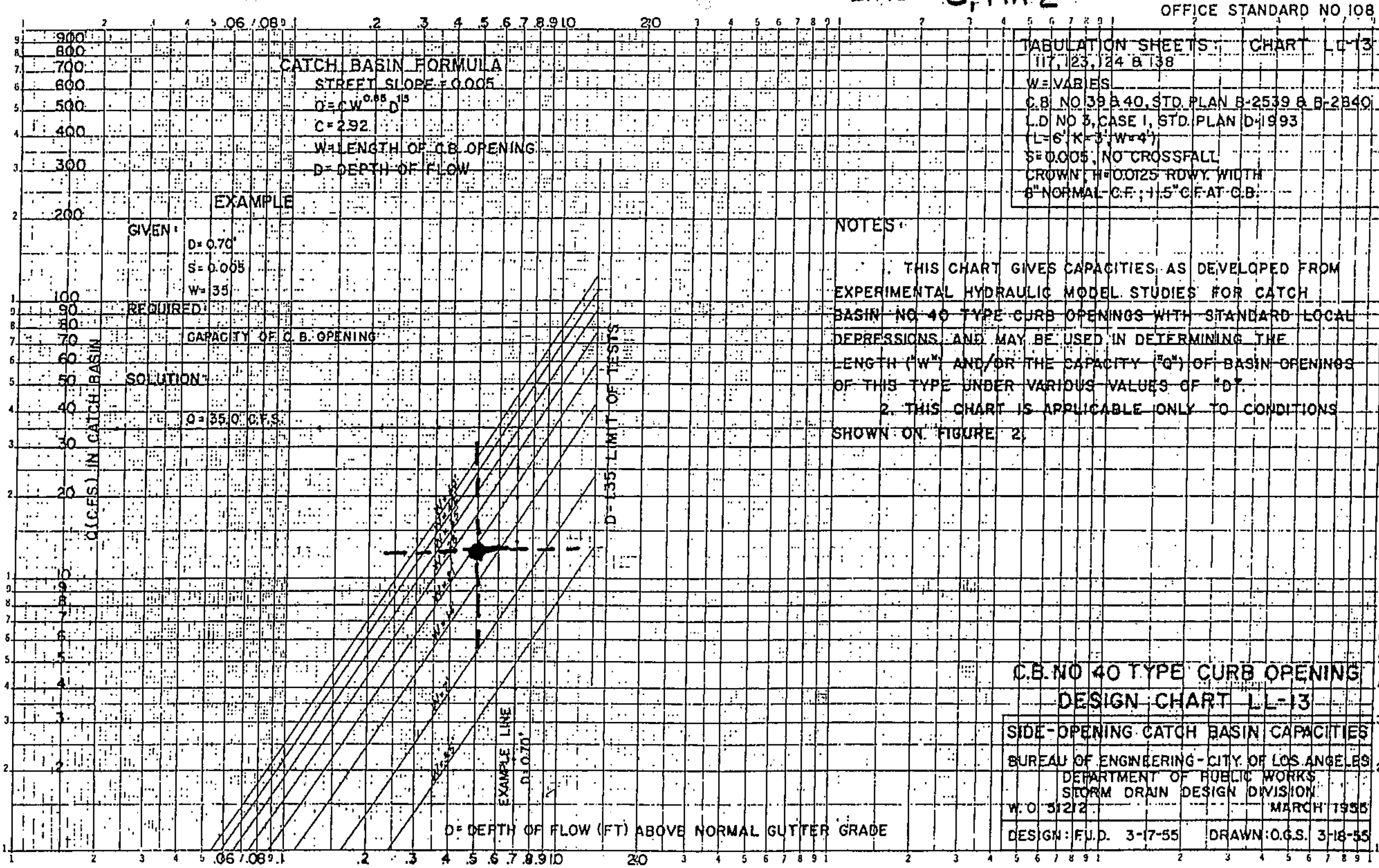
ON-GRADE CONDITION: $W = \left[Q / 2.92 D^{1.5} \right]^{1.17647}$

STA: 14+69.00(E) RIO FELICIA

D = 0.49' W = 20.75

Q = 13.185 USE: W = 21'

LINE: C, MH 2



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

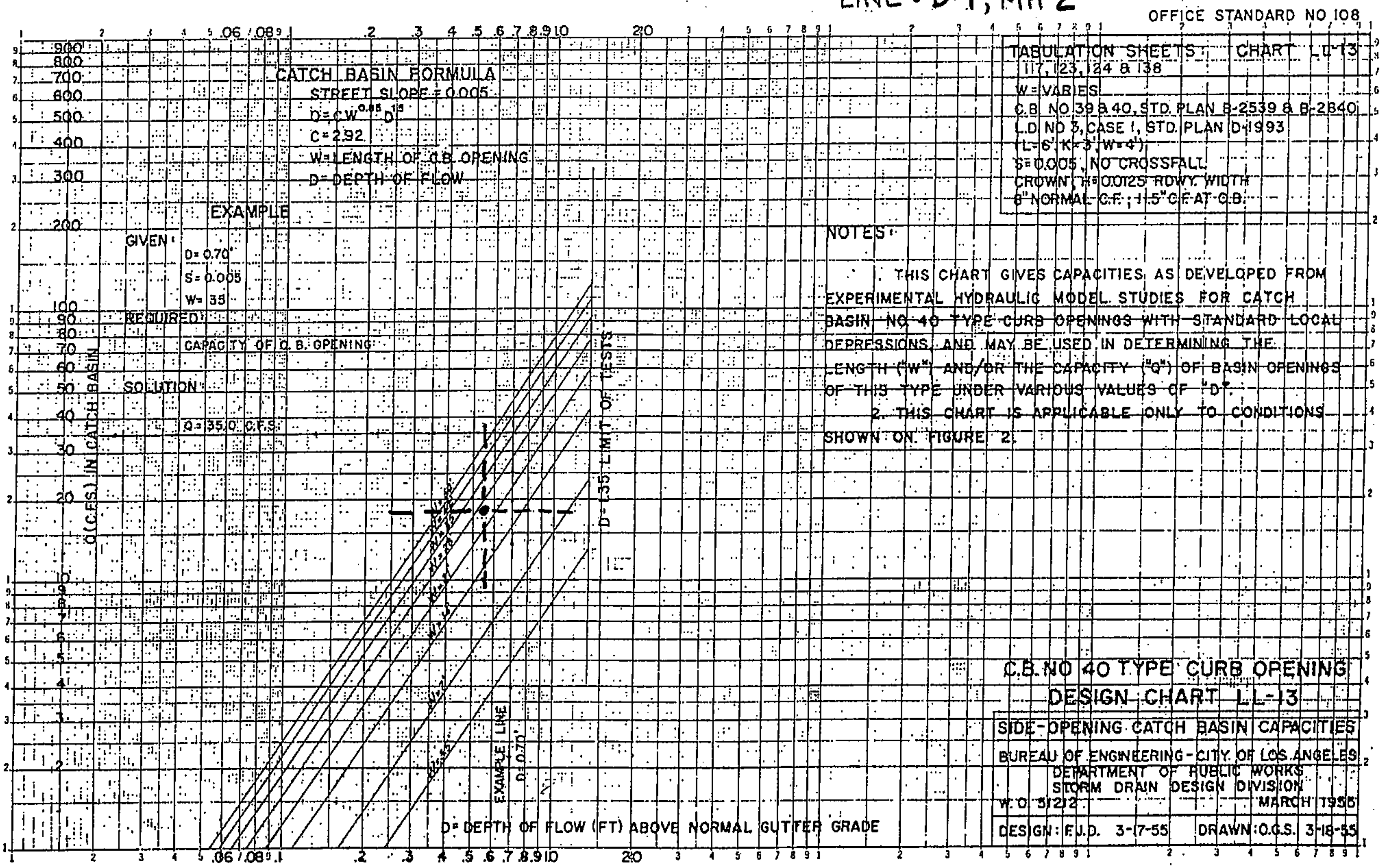
ON-GRADE CONDITION: $W = \left[Q / 2.92 D^{1.5} \right]^{1.17647}$

STA: 26+07.88 (W) AVE. QUINTAN

D = 0.55' W = 24.20

Q = 17.875 USE: W = 25'

LINE: D-1, MH 2



TRACT 28639-1 RIO VISTA VILLAG

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[\frac{Q}{2.92\, D^{1.5}} \right]^{1.17647}$

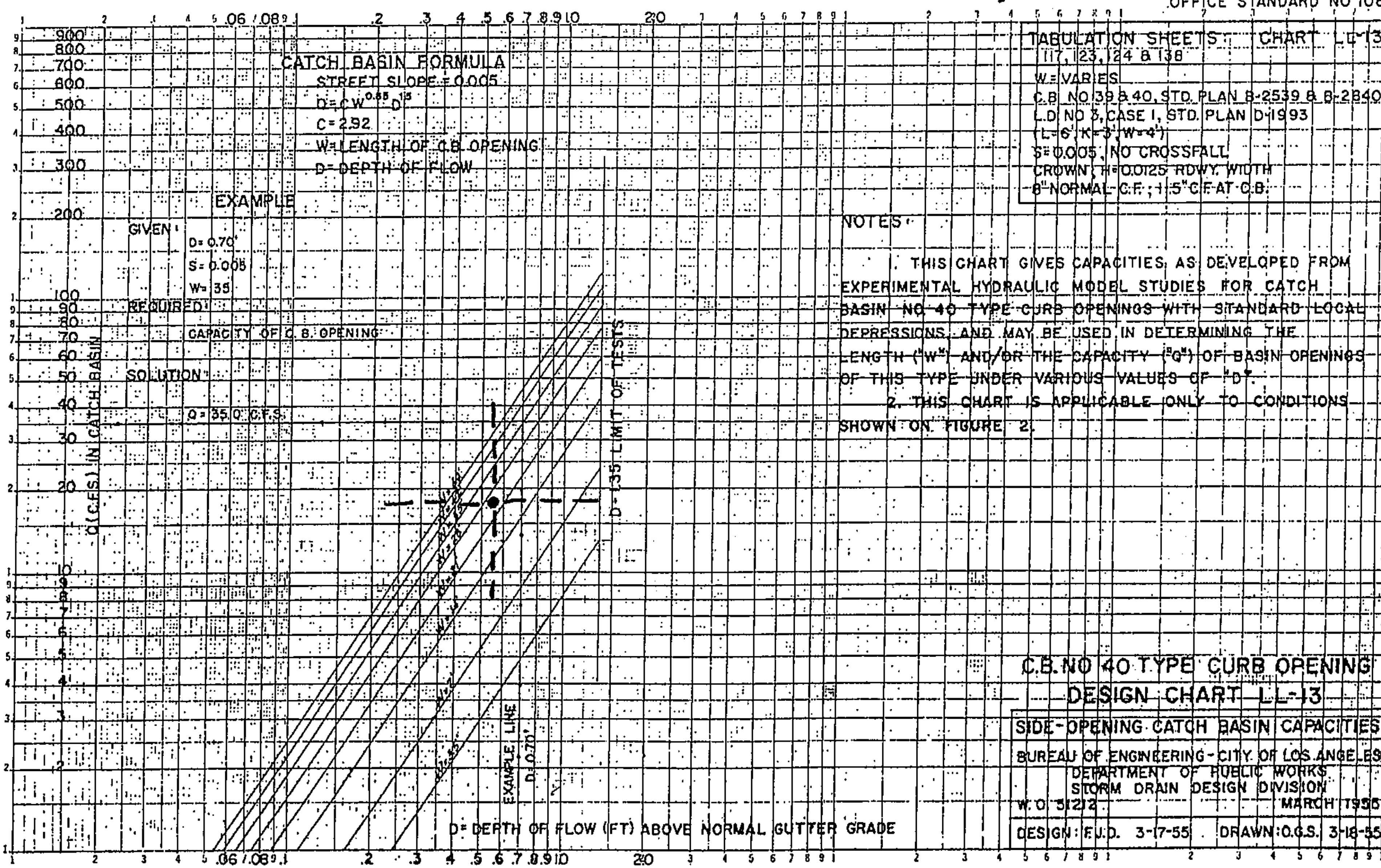
STA: 26+07.88 (E) AVE. QUINTANA

D = 0.55' W = 24.20

Q = 17.875 USE: W = 25'

LINE: D-1, MH 3

OFFICE STANDARD NO 108



TRACT 28639-1 RIO VISTA VILLA

CATCH BASIN CAPACITY CHARTS

SUMP CONDITION : $W = \left[Q/1.62 \right]^{0.88496}$

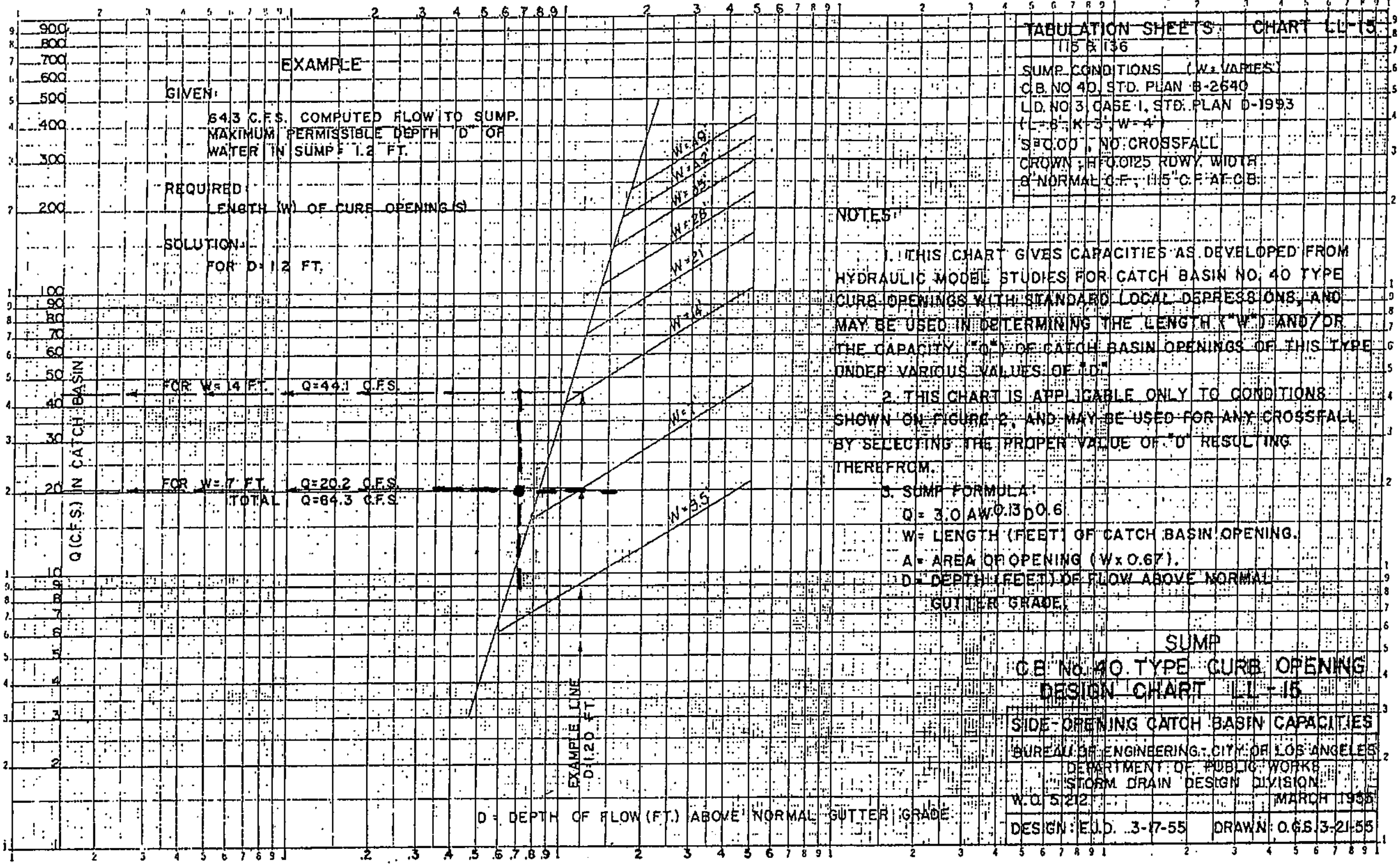
STA : 15+25.00(N) RIO 050

D = 0.7' W = 9.16

Q = 19.79 USE : W = 10'

LINE : D-2, MH 5

OFFICE STANDARD NO. 108



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

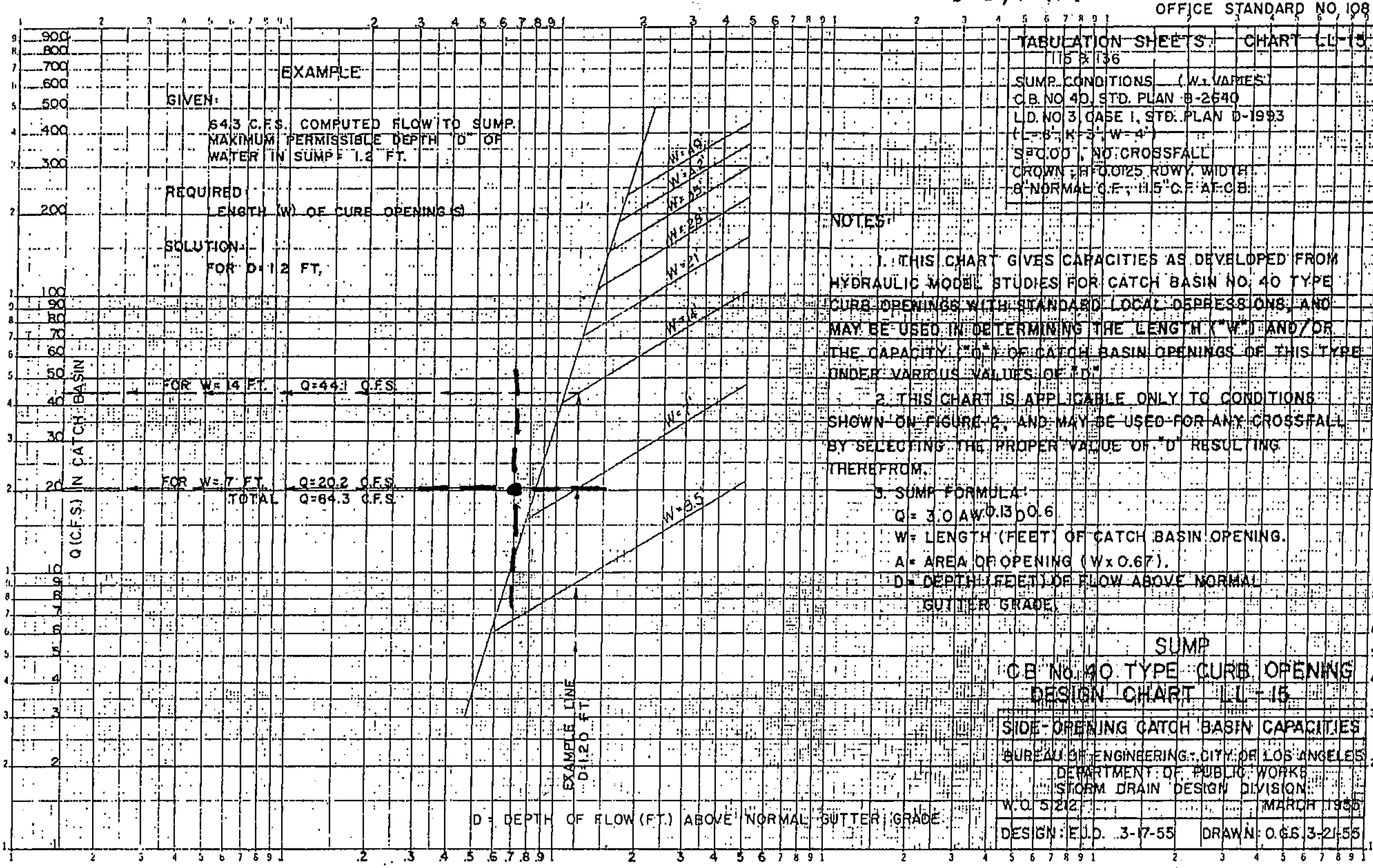
SUMP CONDITION : $W = \left[Q/1.62 \right]^{0.88496}$

STA : 11+52.00(W) RIO OSO

D = 0.7' W = 9.2

Q = 19.89 USE : W = 10'

LINE : D-3, MH6



TRACT 28639-1 RIO VISTA VILLAC

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[Q / 2.92 D^{1.5} \right]^{1.17647}$

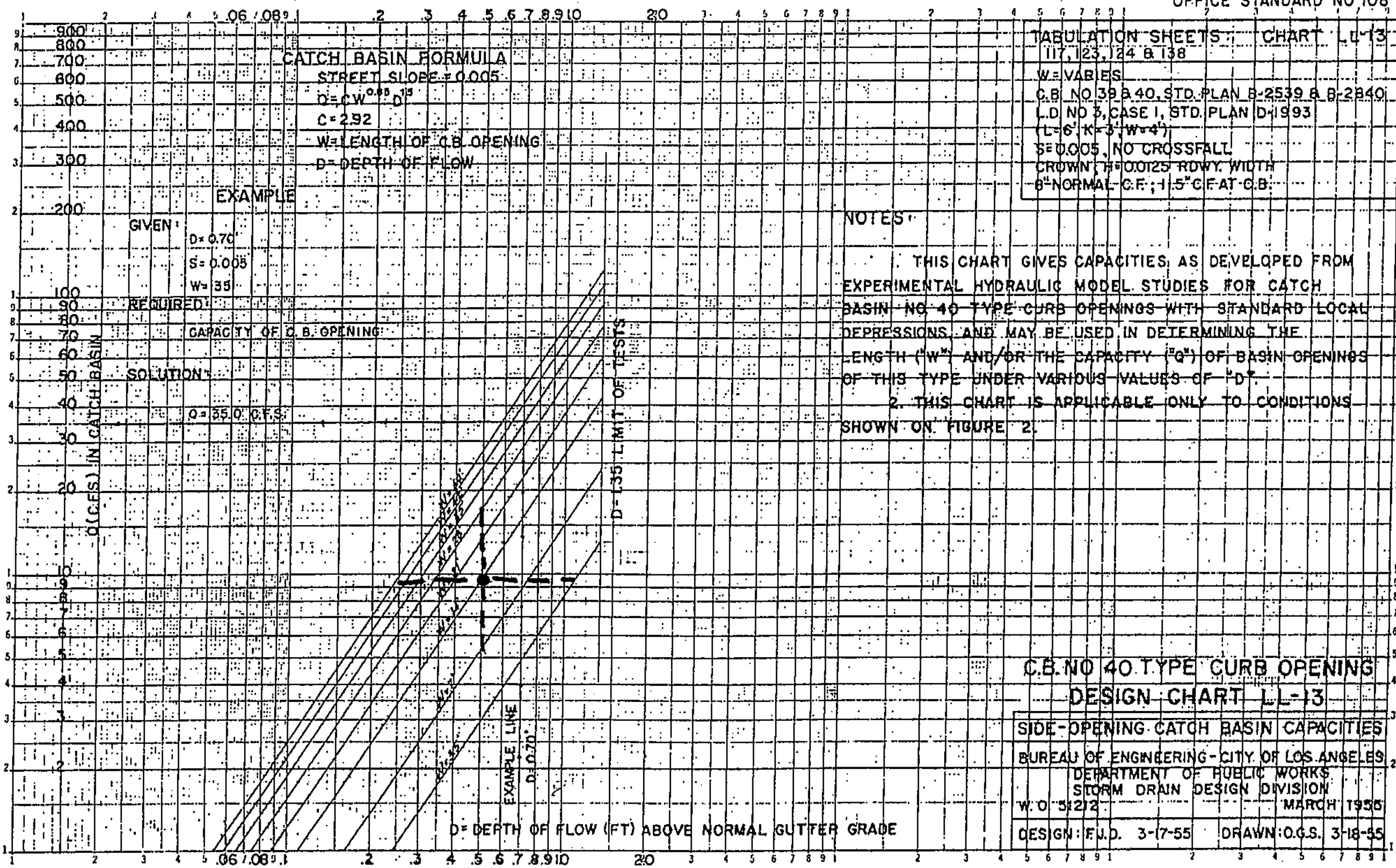
STA: 66+21.30(S) RIO VISTA DR.

D = 0.51' W = 13.179

Q = 9.52 USE: W = 14'

LINE: D-4, MH 1

OFFICE STANDARD NO 108



TRACT 28639-1 RIO VISTA VILLAGE

CATCH BASIN CAPACITY CHARTS

ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

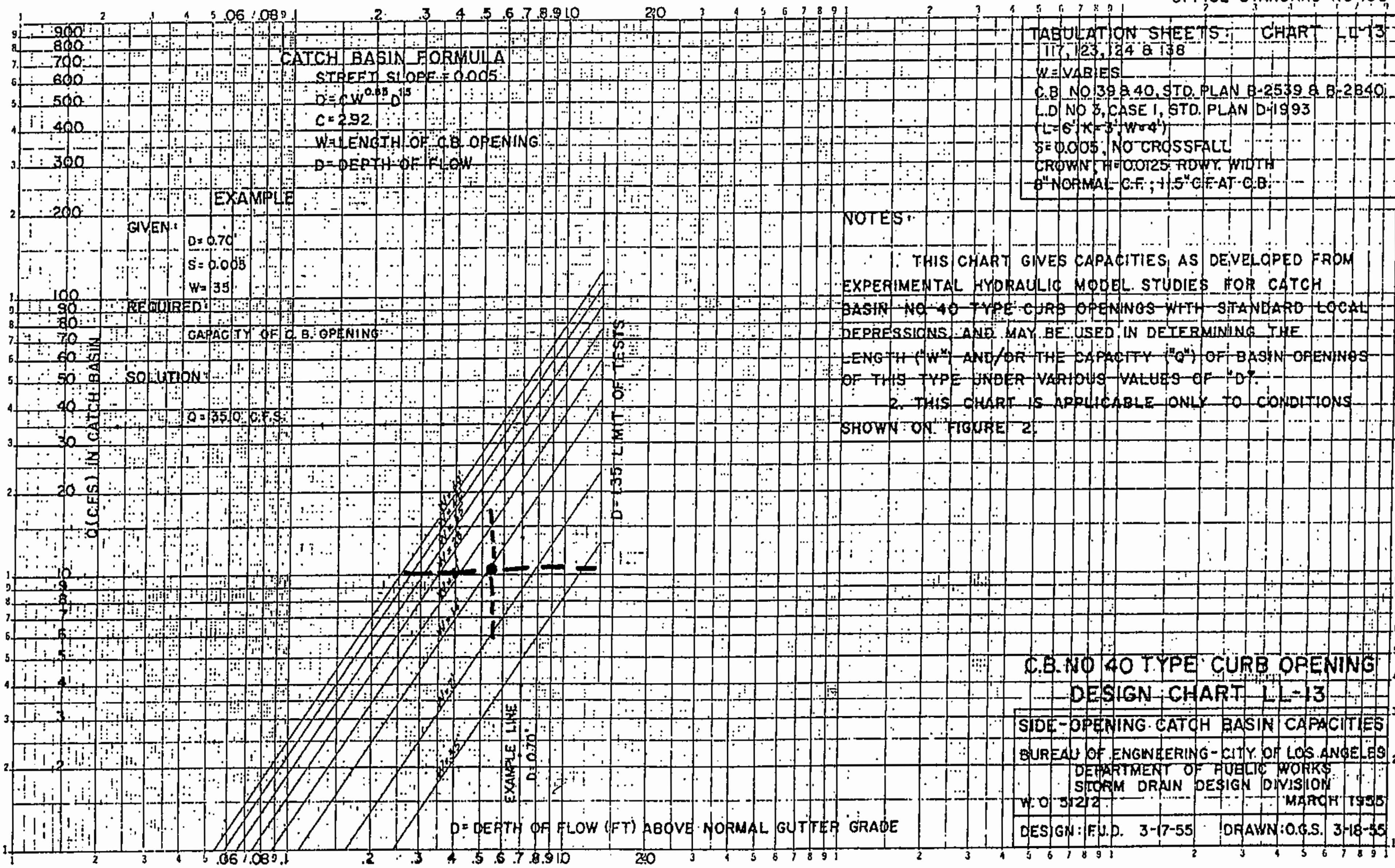
STA: 66+21.30 (N) RIO VISTA DR.

D = 0.55' W = 13.17'

Q = 10.66 USE: W = 14'

LINE: D-5, MH 1

OFFICE STANDARD NO 108



TRACT 28639-1   RIO VISTA VILLAG…

CATCH BASIN CAPACITY CHARTS

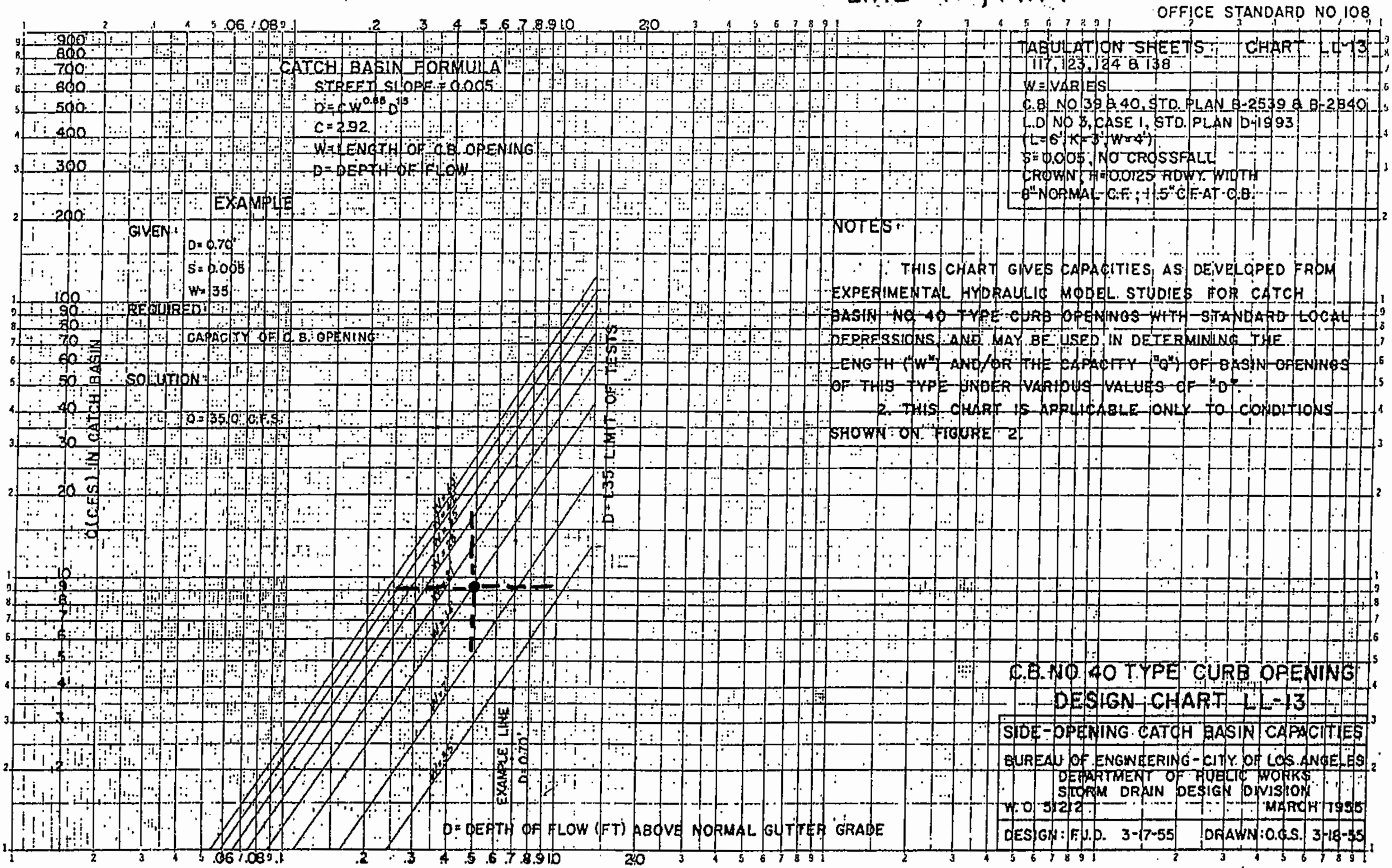
ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

STA: 11+34.81 (W) AVE. QUINTANA

D = 0.51'   W = 12.23'

Q = 8.935   USE: W = 14'

LINE: H1, MH 7



TRACT 28639-1 RIO VISTA VILLA

CATCH BASIN CAPACITY CHARTS

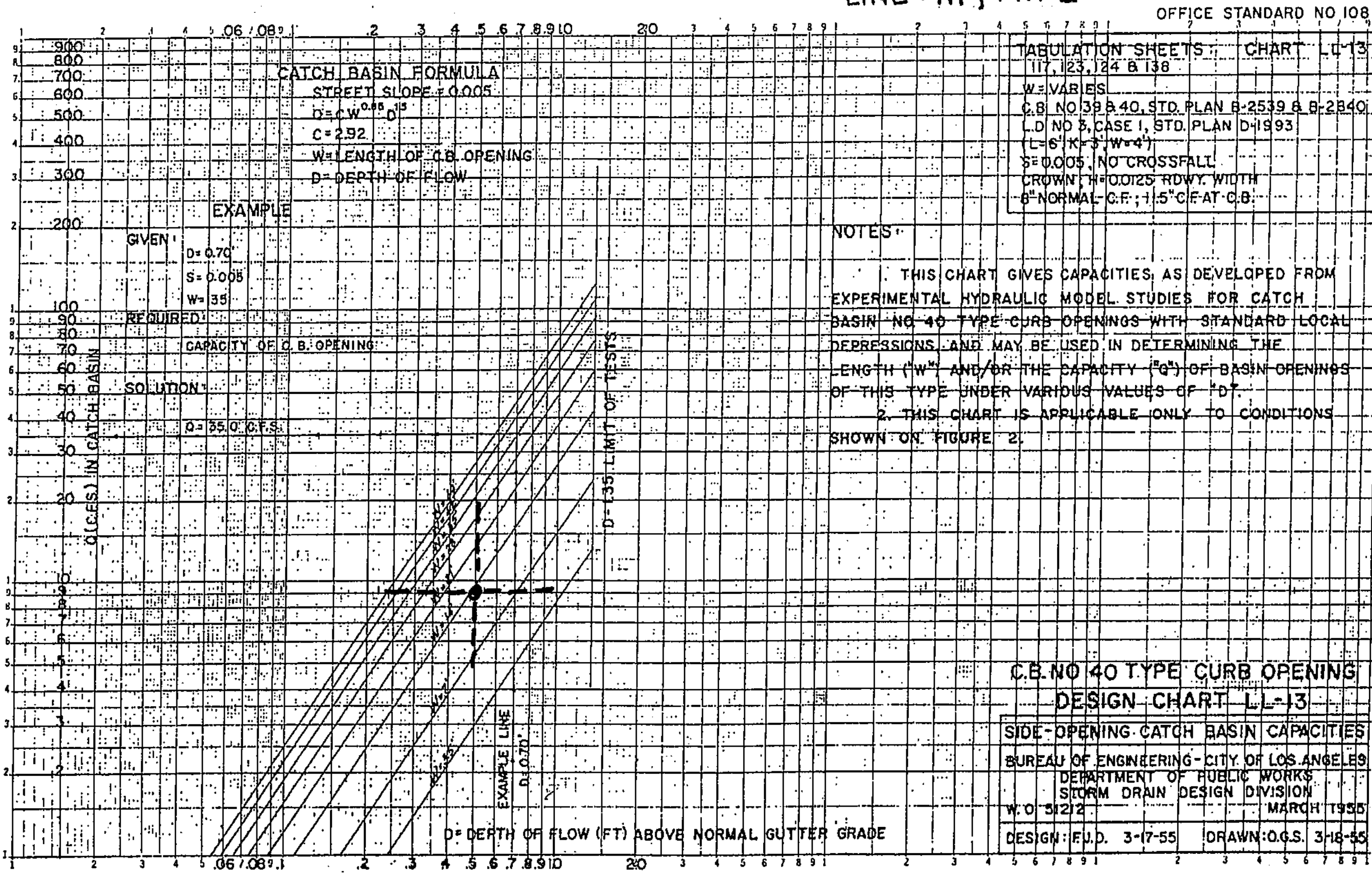
ON-GRADE CONDITION: $W = \left[Q / 2.92\, D^{1.5} \right]^{1.17647}$

STA: 11+34.81 (E) AVE. QUINTANA

D = 0.51' W = 12.23'

Q = 8.935 USE: W = 14'

LINE: H1, MH 2



FILE D.U

RIO VISTA VILLAGE

MASTER PLAN OF DRAINAGE ALTERNATIVE

Prepared by:

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www.aei-casc.com

MARCH 2000

CITY OF CATHEDRAL CITY
ENGINEERING DIVISION
CHECK PRINT
DATE 4-5-00
BY

TABLE OF CONTENTS

SECTION 1: PURPOSE AND SCOPE

Unlike the previous Rio Vista Village Master Plan of Drainage (MPD), this Rio Vista Village Master Plan of Drainage Alternative (MPD-ALT) was prepared based upon the assumption that the 100-year storm flows are allowed to be conveyed within the limits of the public utility easement (PUE). With the exception of Landau Boulevard, the PUE limit extends 9 feet from the right-of-way limit of the proposed streets (see Figure 2).

The extent of the studies establishing this MPD-ALT includes the following:

1. Determination of the flow capacity of the proposed streets at the PUE limit.
2. Preparation of facility map (Exhibit B-1) showing location and sizes of underground facilities and storage capacity of the retention basins.
3. Preparation of the MPD-ALT report, figures, and facility map.

SECTION 2: HYDROLOGY

The hydrology calculations contained in the previous MPD were used in this study.

SECTION 3: CRITERIA

Storm drain facilities are implemented when the 100-year storm flow exceeds the PUE limit. The proposed underground facilities convey storm flows through the site, discharging them into the proposed retention basins. The underground facilities that are proposed in this MPD are located in the proposed right-of-way as shown in the facilities map (Exhibit B-1). Figure 1 shows the street capacity curves based upon varying slopes.

In keeping with the City's requirement of not allowing the 100-year onsite storm flows to leave the project site, retention basins are proposed in this MPD to store storm flows generated onsite.

SECTION 4: PROPOSED FACILITIES

The improvements proposed in the MPD-ALT are shown in the proposed facilities map (see Exhibit B-1). The facility designation corresponds to the stream designation from which the onsite hydrologic data can be obtained. The proposed improvements include underground storm drain facilities and retention basins. For example, the hydrologic data for Facility A1 can be obtained from "Subarea A Hydrology". Similarly, for Basin A, the unit hydrograph volume calculations can be obtained from "Subarea A Hydrograph Calculations". The map shows proposed general alignment and pertinent preliminary size information, as well as the 100-year design flow rates based upon ultimate development condition.

All of the necessary backup hydrological and hydraulics calculations in support of this MPD-ALT was obtained from the previous MPD report entitled, "RIO VISTA VILLAGE MASTER PLAN OF DRAINAGE, February 2000".

The following is a brief description of the proposed MPD-ALT facilities:

- Facility A system, consisting of Lines A-1, A-2, and Basin "A", is proposed to intercept, convey, and retain 100-year storm flows generated by onsite Subarea A. The tributary storm flows are proposed to be discharged into Basin "A". Line A-1 is identified as a 21-inch reinforced concrete pipe (RCP) while Line A-2 is proposed to be a 27-inch RCP. The design flows used to size the proposed underground system are 23 and 33 ft^3/sec (CFS) for Lines A-1 and A-2, respectively. The computed flood volume tributary to Basin "A" is 1.44 Acre-feet (AF). The proposed storage capacity of the retention basin is approximately 2.38 AF. Therefore, no overflow is anticipated from Basin "A".
- Facility B system consists of a continuous underground facility and Basin "B". The underground facility (Line B-1) consists of 36-inch RCP. It is designed to intercept and convey the 100-year tributary storm flow generated by onsite Subarea B of 56 CFS. The computed flood volume tributary to Basin "B" is 1.93 AF. The proposed storage capacity of the retention basin is approximately 3.66 AF. Therefore, no overflow is anticipated from Basin "B".
- Facility C system consists of a continuous underground facility and Basin "C". The underground facility (Lines C-1 and C-2) consists of 33-inch RCP. It is designed to intercept and convey the 100-year tributary storm flow generated by onsite Subarea C of 43 CFS. The computed flood volume tributary to Basin "C" is 1.41 AF. The proposed storage capacity of the retention basin is approximately 1.33 AF. A flood volume of approximately 0.08 AF is proposed to discharge into Basin "D".
- Facility D system consists of Lines D1-1 and D1-2 and Basin "D". The underground facility ranges in size from 36 to 48-inch RCP. It is designed to intercept and convey the 100-year tributary storm flows generated by onsite Subareas D1 and D2, ranging from 43 to 66 CFS. The computed flood volume tributary to Basin "D" is 1.96 AF. By considering the overflow flood volume from Basin "C" of 0.08 AF, the total flood volume discharging into Basin "D" is 2.04 AF. The proposed storage capacity of the retention basin is approximately 2.42 AF. Therefore, no overflow is anticipated from Basin "D".

- Facility E system consists of Lines E1, E2-1, and E2-2 and Basin "E". The underground facility ranges in size from 21 to 33-inch RCP. It is designed to intercept and convey the 100-year tributary storm flows generated by onsite Subareas E1 and E2, ranging from 25 to 54 CFS. The computed flood volume tributary to Basin "E" is 2.09 AF. The proposed storage capacity of the retention basin is approximately 1.80 AF. A flood volume of approximately 0.29 AF is proposed to discharge into Basin "F".

- Facility F system consists of Lines F-1 and Basin "F". The underground facility is proposed to be a 30-inch RCP. It is designed to intercept and convey the 100-year tributary storm flow generated by onsite Subarea F of 38 CFS. The computed flood volume tributary to Basin "F" is 1.51 AF. By considering the overflow flood volume from Basin "E" of 0.29 AF, the total flood volume discharging into Basin "D" is 1.80 AF. The proposed storage capacity of the retention basin is approximately 1.17 AF. A flood volume of approximately 0.63 AF is proposed to discharge into Basin "G".

- Facility G system consists of Lines G-1 and Basin "G". The underground facility is proposed to be a 33-inch RCP. It is designed to intercept and convey the 100-year tributary storm flow of 33 CFS generated by onsite Subarea G. The computed flood volume tributary to Basin "G" is 1.31 AF. By considering the overflow flood volume from Basin "F" of 0.63 AF, the total flood volume discharging into Basin "D" is 1.94 AF. The proposed storage capacity of the retention basin is approximately 3.07 AF. Therefore, no overflow is anticipated from Basin "G".

- Facility H system consists of Lines H1-1, H3, and Basin "H". The underground facility ranges in size from 21 to 30-inch RCP. It is designed to intercept and convey the 100-year tributary storm flows generated by onsite Subareas H1, H2 and H3, ranging from 12 to 57 CFS. The computed flood volume tributary to Basin "H" is 4.21 AF. Basin "H" will be implemented in conjunction with the future development phase associated with Subareas H1, H2, and H3.

- Facility I system, consisting of Lines I-1, I-2, and Basin "I", is proposed to intercept, convey, and retain 100-year storm flows generated by onsite Subarea I. The tributary storm flows are proposed to be discharged into Basin "I". Lines I-1 and I-2 consist of 18-inch RCP. The design flow used to size the proposed underground system is 10 CFS. The computed flood volume tributary to Basin "I" is 0.47 AF. Like Basin "H", Basin "I" will be implemented in conjunction with the future development phase associated with Subarea I.

- Facility J system, consisting of Line J1 and Basins "J1" and "J2", is proposed to intercept, convey, and retain 100-year storm flows generated by onsite Subarea I. Line J1 is proposed to be a 30-inch RCP. It is sized to convey 24 CFS. The computed flood volume tributary to Basins "J1" and "J2" are 3.85 and 1.54 AF, respectively. The proposed basins will be implemented in conjunction with the future development phase associated with Subareas J1 and J2.

- Basins "K1" and "K2" are proposed to retain the 100-year storm flows generated by the onsite Subareas K1 and K2. The computed flood volume tributary to Basins "K1" and "K2" are 0.55 and 0.69 AF, respectively. The proposed basins will be implemented in conjunction with the future development phase associated with Subareas K1 and K2.

SECTION 5: CONCLUSIONS

Based on the study and investigations made for this report, it is concluded that:

1. By utilizing the public utility easement (PUE) for 100-year flow conveyance, the requirement for onsite underground drainage facilities is less than what was proposed in the previous MPD.
2. Based upon the assumption that the 100-year storm flows will be conveyed within the limits of the PUE, implementation of the proposed drainage facilities as presented in this MPD-ALT will provide the Rio Vista Village project with 100-year flood protection from storm flows generated onsite.
3. The onsite 100-year storm flows will be intercepted and conveyed safely through the proposed drainage facilities. Additionally, these storm flows will be retained within the proposed retention basins, with the exception of some minor storm flows that will be allowed to discharge onto Landau Boulevard.
4. In the interim condition, 100-year offsite storm flows emanating from drainage areas to the north may impact the capacity of the proposed MPD-ALT drainage facilities if these flows are allowed to traverse the project site. Similarly, if the existing Morongo Creek Stormwater Channel lacks the flow capacity or structural integrity to convey the tributary storm flows, then the resulting errant flows may impact the capacity of the proposed MPD-ALT facilities.

SECTION 6: RECOMMENDATIONS

It is recommended that:

1. The Rio Vista Village MPD-ALT, as set forth herein, be used as a planning tool for managing the project (onsite) drainage flows.
2. The potential impact of the offsite storm flows to the flow conveyance and storage capacities of the proposed MPD-ALT facilities be evaluated.

BASIN A

FLOOD VOLUME = 1.44 AF
BASIN CAPACITY = 2.38 AF.

BASIN B

FLOOD VOLUME = 1.93 AF
BASIN CAPACITY = 3.66 AF

BASIN C

FLOOD VOLUME = 1.41 AF
BASIN CAPACITY = 1.33 AF
SPILL TO BASIN D = .08 AF

BASIN D

FLOOD VOLUME = 1.96 AF
SPILL FROM BASIN C = .08 AF
TOTAL FLOOD VOLUME= 2.04 AF
BASIN CAPACITY = 2.42 AF

BASIN E

FLOOD VOLUME = 2.09 AF
BASIN CAPACITY = 1.80 AF
SPILL TO BASIN F = .29 AF

BASIN F

FLOOD VOLUME = 1.51 AF
SPILL FROM BASIN F = .29 AF
TOTAL FLOOD VOLUME= 1.80 AF
BASIN CAPACITY = 1.17 AF
SPILL TO BASIN G = .63 AF

BASIN G

FLOOD VOLUME = 1.31 AF
SPILL FROM BASIN F = .63 AF
TOTAL FLOOD VOLUME = 1.94 AF
BASIN CAPACITY = 3.07 AF

BASIN H

FLOOD VOLUME = 4.21 AF

BASIN I

FLOOD VOLUME = .47 AF

BASIN J1

FLOOD VOLUME = 3.85 AF

BASIN J2

FLOOD VOLUME = 1.54 AF

BASIN K1

FLOOD VOLUME = .55 AF

BASIN K2

FLOOD VOLUME = .69 AF

RIO VISTA VILLAGE MASTER PLAN OF DRAINAGE

PROPOSED FACILITIES MAP (ULTIMATE CONDITION)

EXHIBIT "B-1"

AEI·CASC ENGINEERING
937 SOUTH VIA LATA
SUITE # 500
COLTON, CA. 92324
PH. (909) 783-0101 FAX (909) 783-0108

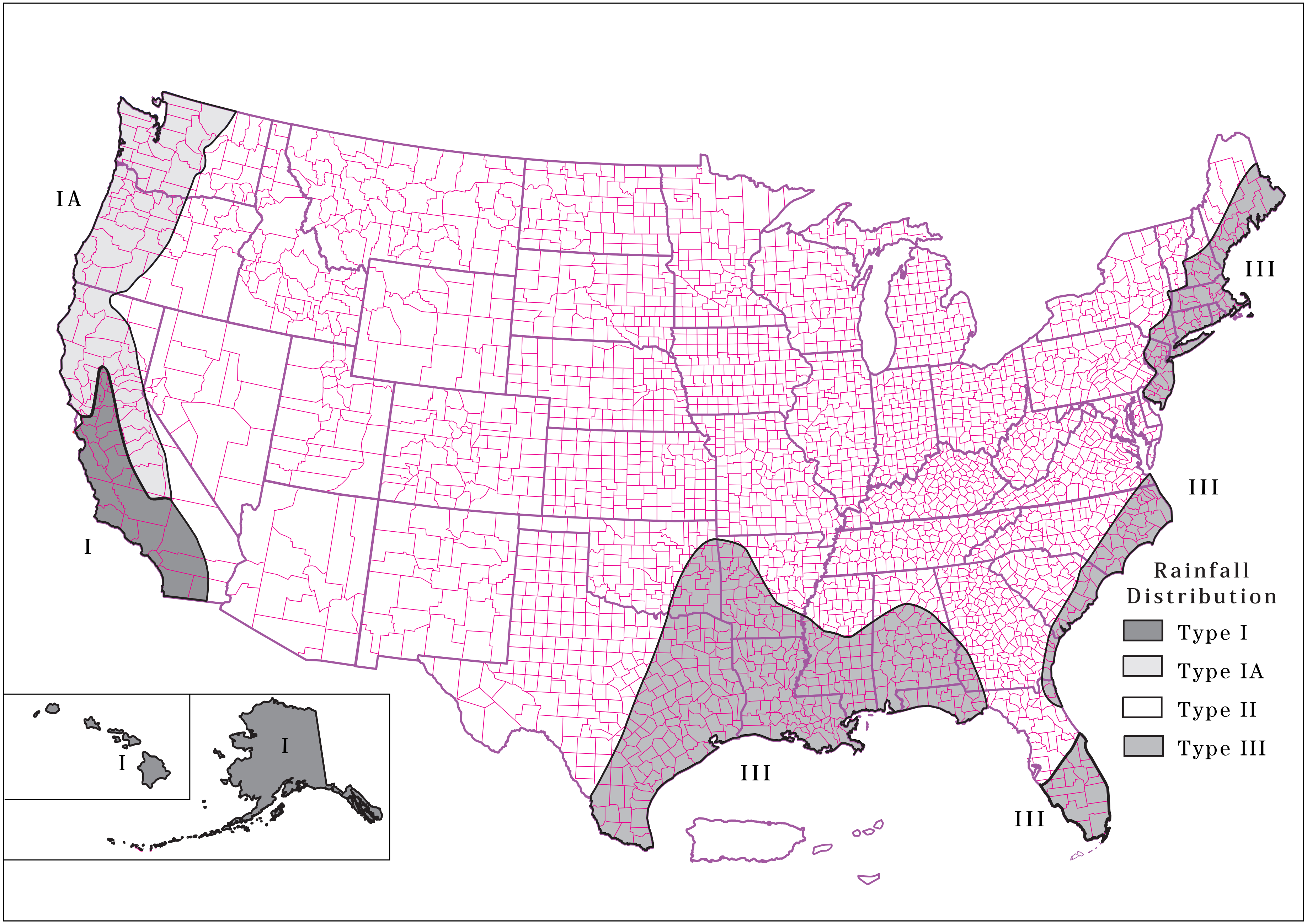
DESIGNED BY:	DRAWN BY:	CHECKED BY:	FILING NO.
JB		CVA	
PLANS PREPARED UNDER THE SUPERVISION OF:			DRAWING NO.
JOHN BURTON R.C.E. 47103		DATE	SHEET 1 OF 1

O:\712_Burnett\ FACILITY_MAP.dwg 02/04/00 14:35

APPENDIX 8

SUPPORTING DOCUMENTS

Figure B-2 Approximate geographic boundaries for NRCS (SCS) rainfall distributions



Runoff Coefficients (C)

Area Description	Coefficient Value	Typical Design
Business:		
Central business	0.70 - 0.95	
District and local	0.50 - 0.70	
Residential:		
Single family	0.35 - 0.45	
Multi-units detached	0.40 - 0.75	
Suburban	0.25 - 0.40	
Apartments	0.50 - 0.70	
Industrial:		
Light	0.50 - 0.80	
Heavy	0.60 - 0.90	
Parks, cemeteries	0.10 - 0.25	
Playgrounds	0.20 - 0.35	
Railroad yards	0.20 - 0.40	
Lawns		
Sandy soil	0.05 - 0.20	
Heavy soil	0.18 - 0.35	0.30
Unimproved	0.10 - 0.30	0.20
Asphaltic	0.70 - 0.95	0.90
Concrete	0.80 - 0.95	0.90
Roofs	0.75 - 0.95	0.90

Source: ASCE

The following table shows SCS curve number values, according to the SCS method for runoff calculations. Please scroll down for a description of the soil groups.

SCS Curve Numbers (CN)

Description of Land Use	Hydrologic Soil Group			
	A	**B**	**C**	**D**
Paved parking lots, roofs, driveways	98	98	98	98
Streets and Roads				
Paved with curbs and storm sewers	98	98	98	98
Gravel	76	85	89	91
Dirt	72	82	87	89
Cultivated (Agricultural Crop) Land				
Without conservation treatment (no terraces)	72	81	88	91
With conservation treatment (terraces, contours)	62	71	78	81
Pasture or Range Land				
Poor (<50% ground cover or heavily grazed)	68	79	86	89
Good (50-75% ground cover; Not heavily grazed)	39	61	74	80
Meadow (grass, no grazing, mowed for hay)	30	58	71	78
Brush (good, >75% ground cover)	30	48	65	73
Woods and Forests				
Poor (small trees/brush destroyed by over-grazing or burning)	45	66	77	83
Fair (grazing but not burned; some brush)	36	60	73	79
Good (no grazing; brush covers ground)	30	55	70	77
Open Spaces (lawns, parks, golf courses, cemeteries, etc.)				
Fair (grass covers 50 – 75% of area)	49	69	79	84
Good (grass covers >75% of area)	39	61	74	80
Commercial and Business Districts (85% impervious)	89	92	94	95
Industrial Districts (72% impervious)	81	88	91	93
Residential Areas				
1/8 acre lots, about 65% impervious	77	85	90	92
1/4 acre lots, about 38% impervious	61	75	83	87
1/2 acre lots, about 25% impervious	54	70	80	85
1 acre lots, about 20% impervious	51	68	79	84

Group A Soils: High infiltration (low runoff). Sand, loamy sand, or sandy loam. Infiltration rate > 0.3 in/hr when wet.

Group B Soils: Moderate infiltration (moderate runoff). Silt loam or loam. Infiltration rate 0.15 – 0.30 in/hr when wet.

Group C Soils: Low infiltration (moderate to high runoff). Sandy clay loam. Infiltration rate 0.05 – 0.150 in/hr when wet.

Group D Soils: Very low infiltration (high runoff). Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 – 0.05 in/hr when wet.