PRELIMINARY HYDROLOGY AND HYDRAULICS STUDY FOR SADDLEBACK INDUSTRIAL

APN 389-220-003 AND 389-220-004

CITY OF LAKE ELSINORE
CALIFORNIA

PREPARED FOR:

SADDLEBACK ASSOCIATES
C/O MARK SEVERSON
27405 PUERTA REAL, SUITE 120
MISSION VIEJO, CA 92691
(949) 635-1970

PREPARED BY:

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552
FAX 951.304.3568

APRIL 2, 2020
REVISED:

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.



Joseph L. Castaneda RCE 59835 Registered Civil Engineer	04/02/2021 Date	Seal

TABLE OF CONTENTS

I. PURPOSE AND SCOPE 1
II. PROJECT SITE AND DRAINAGE AREA OVERVIEW 1
III. HYDROLOGY 2
IV. HYDRAULICS 3
V. WATER QUALITY AND HCOC MITIGATION 4
VI. FINDINGS 6
VII. REFERENCES 6

FIGURES

FIGURE 1: **VICINITY MAP**

TABLES

TABLE 1: **EXISTING CONDITION MIXED LAND USE AREAS WEIGHTED RUNOFF INDEX AND WEIGHTED PERVIOUS FRACTIONS**

APPENDICES

APPENDIX A: **PRE-PROJECT CONDITION RATIONAL METHOD HYDROLOGY**
APPENDIX A.1: AREA "A" – 100-YEAR STORM EVENT
APPENDIX A.3: AREA "B" – 100-YEAR STORM EVENT

APPENDIX B: **POST-PROJECT CONDITION ONISTE RATIONAL METHOD HYDROLOGY**
APPENDIX B.1: AREA "A" – 100-YEAR STORM EVENT
APPENDIX B.2: AREA "A" – 10-YEAR STORM EVENT
APPENDIX B.3: AREA "B" – 100-YEAR STORM EVENT
APPENDIX B.4: AREA "B" – 10-YEAR STORM EVENT
APPENDIX B.5: AREA "C" – 100-YEAR STORM EVENT
APPENDIX B.6: AREA "C" – 10-YEAR STORM EVENT

APPENDIX C: **PRE-PROJECT CONDITION UNIT HYDROGRAPH HYDROLOGY CALCULATIONS**
APPENDIX C.1: AREA "A" – 2-YEAR, 24-HOUR STORM EVENT
APPENDIX C.2: AREA "B" – 2-YEAR, 24-HOUR STORM EVENT
APPENDIX C.3: AREA "C" – 2-YEAR, 24-HOUR STORM EVENT

APPENDIX D: **POST-PROJECT CONDITION UNIT HYDROGRAPH HYDROLOGY CALCULATIONS**
APPENDIX D.1: AREA "A" – 2-YEAR, 24-HOUR STORM EVENT
APPENDIX D.2: AREA "B" – 2-YEAR, 24-HOUR STORM EVENT

APPENDIX D.3: AREA "C" – 2-YEAR, 24-HOUR STORM EVENT

APPENDIX E: HYDRAULIC CALCULATIONS
APPENDIX E.1: GRATE INLET AND CURB INLET NORMAL DEPTH CALCULATIONS
APPENDIX E.2: LINE "A1" NORMAL DEPTH CALCULATION
APPENDIX E.3: LINE "A2" NORMAL DEPTH CALCULATION
APPENDIX E.4: LINE "B1" NORMAL DEPTH CALCULATION
APPENDIX E.5: LINE "B2" NORMAL DEPTH CALCULATION
APPENDIX E.6: LINE "C1" NORMAL DEPTH CALCULATION
APPENDIX E.7: LINE "C2" NORMAL DEPTH CALCULATION
APPENDIX E.8: LINE "1" FRICTION SLOPE CALCULATIONS

APPENDIX F: WATER QUALITY
APPENDIX F.1: 85TH PERCENTILE RAINFALL MAP
APPENDIX F.2: SANTA ANA WATERSHED BMP DESIGN FLOW RATE SPREADSHEETS
APPENDIX F.3: MODULAR WETLANDS REFERENCE MATERIAL

APPENDIX G: SUBSURFACE BASIN VOLUME CALCULATIONS
APPENDIX G.1: SUBSURFACE BASIN "A"
APPENDIX G.2: SUBSURFACE BASIN "B"
APPENDIX G.3: SUBSURFACE BASIN "C"

EXCERPTS

EXCERPT A: STREET IMPROVEMENT PLANS FOR COLLIER AVENUE

EXHIBITS

EXHIBIT A: PRE-PROJECT RATIONAL METHOD HYDROLOGY MAP
EXHIBIT B: POST-PROJECT ONSITE RATIONAL METHOD HYDROLOGY MAP
EXHIBIT C: UNIT HYDROGRAPH WATERSHED MAP
EXHIBIT D: DRAINAGE FACILITIES MAP
EXHIBIT E: HYDROLOGIC SOILS MAP
EXHIBIT F: RAINFALL MAPS

I. PURPOSE AND SCOPE

Saddleback Industrial is a proposed commercial project site located in the City of Lake Elsinore. The project will construct buildings, parking areas, utility infrastructure, four modular wetlands, four subsurface systems, and subsurface storm drain.

The scope of the study includes the following:

1. Determination of the 100-year peak storm flows based upon the pre-project onsite and offsite condition utilizing the Rational Method as outlined in the Riverside County Hydrology Manual.
2. Determination of the 100-year and 10-year peak storm flows based upon the post-project onsite condition utilizing the Rational Method as outlined in the Riverside County Hydrology Manual.
3. Perform pre-project and post-project unit hydrograph hydrology calculations for the areas tributary to the subsurface basins for the 2-year, 24-hour storm duration utilizing the Unit Hydrograph method as outlined in the Riverside County Hydrology Manual.
4. Determine the preliminary storm drain infrastructure to intercept the tributary flows to the north of the project site and convey the flows through the project site.
5. Determine the preliminary onsite storm drain infrastructure to convey the onsite flows.
6. Determine the required water quality flow rate to be treated within the modular wetlands.
7. Determine the required volume to be stored in order to address the hydrologic conditions of concern consistent with the Water Quality Management Plan.
8. Preparation of a preliminary hydrology report, which consists of hydrological and analytical results and exhibits.

II. PROJECT SITE AND DRAINAGE AREA OVERVIEW

Saddleback Industrial is proposing to construct commercial buildings, parking lot area, subsurface storm drain, 4 modular wetlands and 4 subsurface basins that will convey flows and treat flows for water quality purposes. The project is approximately 7.3 acres, and is roughly bounded by Interstate 215 to the north, the Lake Elsinore Outlets to the west, Lake Elsinore Self-Storage to the east, and fronting Collier Avenue to the south. The project is located in Section 36 of Township 5 South, Range 5 West.

Approximately 450 ft^3/s discharges onto the site from the culverts crossing Interstate 15, and the flows will sheet flow across the project site. An existing concrete trapezoidal channel is located adjacent to Collier Avenue to collect these flows, as well as flows from Riverside Drive and Collier Avenue for a total of potentially 550.2 ft^3/s tributary to the channel. These flows are then conveyed to an existing RCB structure that discharges into Temescal Canyon Wash on the opposite site of Collier Avenue. The improvement plans for the RCB Structure and the existing storm drain infrastructure adjacent to Collier Avenue indicate a flow rate of 124.5 ft^3/s, which is approximately 25% of the potentially tributary flow rate to this system.

Due to the lack of capacity for this system, a new RCB structure will be constructed that will collect flows north of the project site discharging from the Interstate 15 Culvert, and convey the flows through the project site to the same downstream terminus within Temescal Canyon Wash. The existing RCB structure will be removed.

Currently, an existing 36" storm drain crosses Riverside Drive at Collier Avenue, and continues north westerly along Collier Avenue and discharges into the existing concrete trapezoidal channel. The project remove the majority of the existing concrete trapezoidal channel, and construct a 36" pipe (or elliptical equivalent where cover is limited) that extends to the project limits. Since this is the size pipe that currently conveys flows across Riverside Drive, and the project is intercepting the bulk of the flow north of the project, the project will not be adversely impacting the flooding along Collier Avenue.

III. HYDROLOGY

The Riverside County Hydrology Manual (Reference 1), was used to develop the hydrological parameters for the hydrology analyses. The rational method calculations were performed using the computer program developed by Civil Cadd/Civil Design.

The existing soil classification for the area consists of Hydrologic Soil Group "A", "B", "C" and "D", as shown in Exhibit E. Exhibit E is a Soils Map obtained from the United States Department of Agriculture's Natural Resources Conservation Service WebSoil Survey. An Antecedent Moisture Condition (AMC) I was utilized for the 2-year storm event, and an AMC II was utilized for the 10-year and 100-year storm event, as recommended by the Riverside County Hydrology Manual.

The rainfall values were obtained from the Riverside County Hydrology Manual's Isohyetal Maps, and are summarized below:

Storm Event	1-hour	3-hour	6-hour	24-hour
2-Year	0.58	1.00	1.40	2.50
100-Year	1.45	2.50	3.50	6.50

The slope of intensity duration curve value is 0.45. The rainfall maps and the Slope of Intensity Duration Curves have been included as Exhibit F.

The pre-project condition was analyzed using several land uses based upon the existing terrain and Google imagery. The following table summarizes the land uses used, and the corresponding runoff index numbers and pervious fractions:

Land Use	Soil "A" Runoff Index	Soil "B" Runoff Index	Soil "C" Runoff Index	Soil "D" Runoff Index	Pervious Fraction
1 Acre Residential	32	56	69	75	0.8
¼ Acre Residential	32	56	69	75	0.40
School	32	56	69	75	0.40
Commercial	32	56	69	75	0.1
Undeveloped	62	76	84	88	0

The existing cemetery that is located on Collier Avenue included in Area B, was analyzed as 1 Acre Residential due to the low pervious area included in the cemetery. The area downstream of the cemetery was analyzed as commercial, which is considered conservative for this area. Area A consists of 1 Acre Residential, ¼ Acre Residential, A high school, commercial, and undeveloped land use. Areas A4, A6, A7, A8 and A15 are mixed land use areas, and a weighted runoff index number and weighted pervious fraction were calculated. These calculations have been included as Table 1 in the report.

The post-project onsite hydrology was analyzed as commercial land use. A total of 7.25 acres was analyzed, and all onsite flows are tributary to the proposed RCB system traversing the project site.

Unit hydrograph calculations were performed for the onsite areas tributary to the subsurface systems for the 2-year, 24-hour storm duration. The calculations were performed for the pre-project and post-project conditions in order to determine the required volume to be stored to address the Hydrologic Conditions of Concern associated with the WQMP requirements.

The pre-project condition rational method hydrology is included in Appendix A, and the pre-project condition rational method hydrology map is included as Exhibit A. The post-project condition rational method hydrology is included in Appendix B, and the post-project condition rational method hydrology map is included as Exhibit B. The pre-project and post-project condition unit hydrograph calculations have been included as Appendix C and D, respectively, and the Unit Hydrograph Watershed Map has been included as Exhibit C.

IV. HYDRAULICS

The project will utilize subsurface storm drain and inlets flood protect the site and convey the tributary flows.

The offsite flows will be intercepted by an 8'W x 5'H RCB (designated as Line 1), which will transition to a double 6'W x 3.5'H RCB due to cover at the downstream portion of the project site. The upstream flow rate is 440.2 ft^3/s, and the downstream flow rate used is the 440.2 ft^3/s plus 12.6 ft^3/s from node 110-115 (without the flow rate of 440.2 at node 110),

51.8 ft^3/s from node 114-115, and 44.4 ft^3/s at node 203 for a total downstream flow rate of 549.0 ft^3/s. This is a conservative flow rate since the likelihood that all of these flows can adequately be conveyed to the downstream reach of the Line 1 system is unlikely. However, during the preliminary stages, this number is used to be conservative. During final engineering, detailed street capacity and existing capacity analyses for the 36" pipe crossing Riverside Drive will be performed to determine the actual flow rate reaching Line 1. An additional catch basin has been provided at the low point of Collier Road fronting the project site. Line 1 was sized using the friction slope, and a detailed Water Surface Profile Gradient Program Calculation will be performed during final engineering.

Inlets #1 and #2 are located within a ribbon gutter on grade down the center isle of the project. These are 3' x 3' grates that are in series, with Inlet #1A being the upstream most inlet and Inlet #1E being the downstream most inlet. Inlet#2 has Inlet #2A as the upstream inlet and Inlet #2D as the downstream inlet. These were modeled as grate inlets Ditch Inlets On Grade, with the bypass flow being the tributary flow rate for the next downstream grate inlet. The bypass for Inlet #1E is added to the flow rate for Inlet #2A. The following table summarizes the flow rates utilized in the Inlet Sizing Calculations:

Inlet	100-Year Flow Rate	Upstream Tributary Bypass	Total Flow Rate for Calculation	Intercepted Flow Rate	Bypass Flow Rate	Downstream Inlet	Storm Drain Flow Rate
1A	6.46 ft^3/s	0	6.46 ft^3/s	1.87 ft^3/s	4.59 ft^3/s	1B	
1B	0	4.59 ft^3/s	4.59 ft^3/s	1.48 ft^3/s	3.11 ft^3/s	1C	
1C	0	3.11 ft^3/s	3.11 ft^3/s	1.13 ft^3/s	1.98 ft^3/s	1D	5.85 ft^3/s
1D	0	1.98 ft^3/s	1.98 ft^3/s	0.82 ft^3/s	1.16 ft^3/s	1E	
1E	0	1.16 ft^3/s	1.16 ft^3/s	0.55 ft^3/s	0.61 ft^3/s	2A	
2A	3.40 ft^3/s	0.61 ft^3/s	4.01 ft^3/s	1.30 ft^3/s	2.71 ft^3/s	2B	
2B	0	2.71 ft^3/s	2.71 ft^3/s	0.99 ft^3/s	1.72 ft^3/s	2C	3.50 ft^3/s
2C	0	1.72 ft^3/s	1.72 ft^3/s	0.72 ft^3/s	1.00 ft^3/s	2D	
2D	0	1.00 ft^3/s	1.00 ft^3/s	0.49 ft^3/s	0.51 ft^3/s	Trench Drain	
3	1.98 ft^3/s	0	1.98 ft^3/s	1.98 ft^3/s	0		1.98 ft^3/s
4	5.25 ft^3/s	0	5.25 ft^3/s	5.25 ft^3/s	0		5.25 ft^3/s
5	5.81 ft^3/s	0	5.81 ft^3/s	5.81 ft^3/s	0		5.81 ft3/s

The flow rates for the storm drain systems immediately downstream of the inlets are based upon the intercepted flow rates shown in the table above. The outlet pipes for the subsurface basins are based upon the total hydrology flow rate for the area, not accounting for bypass. During final engineering, detailed water surface profile gradient program calculations will be performed for the proposed storm drain systems.

The inlet and storm drain sizing calculations have been included in Appendix E, and the Drainage Facilities Map has been included as Exhibit D.

V. WATER QUALITY AND HCOC MITIGATION

The project will treat the required water quality volume via four modular wetlands systems and will address the hydrologic conditions of concern via four subsurface basins.

Water quality flow rates were calculated using the Santa Ana Watershed BMP Design Volume and Design Flow Rate Spreadsheet. These values were then compared to the modular wetlands fact sheets to determine the preliminary sizes required to treat the project site. The rainfall depth for the project site is 0.70 inches.

DMA A will drain to Modular Wetlands "A", which will be located subsurface with the exception of the planted area, which will be located in the landscaped median. Flows will be intercepted by a series of grate inlets located along the ditch in the center isle. Due to the vertical constraint of the site, a subsurface system had to be provided for DMA A, since the subsurface systems for DMA B or C could not provide enough volume for DMA A. Due to the location of Subsurface Basin A, the only feasible treatment mechanics is a subsurface modular wetlands, as a curb opening was not feasible along the center isle ribbon gutter. Flows ultimately discharge into Subsurface Basin A for HCOC mitigation.

DMAs B1 and B2 will drain to Modular Wetlands B1 and B2, respectively. DMA B1 will have two collection points, one within the ribbon gutter (similar to DMA A) and one at a low point in the parking stalls. A curb opening will be provided for the low point, and grate inlets will be provided within the ribbon gutter. The flows from the grate inlets will be conveyed to a side opening within the modular wetlands that will allow the flows to be treated in Modular Wetlands B1. DMA B2 will drain to a low point in the west corner of the project site and enter through a curb opening modular wetlands. Both DMAs B1 and B2 will discharge into Subsurface Basin B for HCOC mitigation.

DMA C drains to a low point in the parking area just south of the main entrance driveway. The flows will enter the Modular Wetlands via a curb opening. The entrance driveway slopes towards Collier Avenue, therefore a trench drain will be constructed at the right-of-way in order to intercept the flows and convey them to Modular Wetlands C. Flows are then conveyed to Subsurface Basin C for HCOC mitigation.

The modular wetlands were sized using the Santa Ana Watershed BMP Design Flow Rate Spreadsheet and the Modular Wetlands Brochure. The design flow rate is based upon a design rainfall intensity of 0.20 in/hr. The DMA's assume 90% impervious for commercial area. During final engineering, a detailed impervious fraction will be calculated using the pervious and impervious areas within the site. However, since this is a preliminary WQMP and the site will likely go through revisions during the entitlement process.

The design flow rate was then compared to the Bioclean Modular Wetlands brochure to determine the size of the modular wetlands needed to address water quality. Based upon the sizing table, the following are the minimum size requirements:

DMA	Area (sq. ft.)	QBMP	MWS Treatment Flow Rate	MWS Model
A	94,525	0.40 cfs	0.577 cfs	MWS-L-8-20
B1	70,132	0.30 cfs	0.346 cfs	MWS-L-8-12
B2	69,696	0.30 cfs	0.346 cfs	MWS-L-8-12
C	81,457	0.30 cfs	0.346 cfs	MWS-L-8-12

During final engineering, the exact model number and design will be determined through coordination with BioClean. The design will ensure that the QBMP treatment flow rate is met

Pre-project and post-project unit hydrograph calculations were performed for DMA's A, B and C to determine the required volume needed to address the hydrologic conditions of concern and mitigate for increased runoff. The flows will be detained in subsurface basins and metered out through a structure that will be designed during final engineering. During the preliminary stages, the existing condition flow rate was used to determine the required volume that must be stored in order to meeting the hydrologic conditions of concern criteria. The existing flow rate was found on the recess limb of the post-project condition unit hydrograph to determine the corresponding volume. This would ensure that if this volume in its totality is stored in the subsurface system, only the existing condition flow rate will discharge from the subsurface systems. The following table summarizes the results:

	2-Year, 24-Hour Storm Duration						
DMA	Pre-Project Flow Rate	Pre-Project Volume (ac-ft)	Post-Project Flow Rate	Post-Project Volume (ac-ft)	Volume on Recess Limb of Hydrograph @ Pre-Project Flow Rate (ac-ft)	Volume on Recess Limb of Hydrograph @ Pre-Project Flow Rate (cu. ft.)	Subsurface System Storage Volume (cu. ft.)
DMA A	0.111 ft^3/s	0.0673	0.610 ft^3/s	0.3707	0.3359	14,632	15,485
DMA B	0.110 ft^3/s	0.0669	0.902 ft^3/s	0.5484	0.5246	22,852	23,105
DMA C	0.064 ft^3/s	0.0390	0.526 ft^3/s	0.3195	0.3056	13,312	13,365

It should be noted that DMA B includes two subsurface systems that will be connected with an equalization pipe, and will have the same invert elevation. This was required as the subsurface basins adjacent to Collier Avenue was not sufficient for HCOC mitigation of DMA B. Therefore the second Subsurface Basin is proposed and will equalize and function as one basin with the basin adjacent to Collier Avenue.

Based upon the preliminary sizing, the subsurface systems will adequate address the hydrologic conditions of concern. During final engineering, detailed basin routing will be

performed for the subsurface basins and their corresponding outlet structures to demonstrate HCOC compliance.

Since the project site is discharging into an existing floodplain, increased runoff mitigation is not required, only the hydrologic conditions of concern mitigation as required by the Water Quality Management Plan.

The water quality calculations have been included in Appendix F, and the subsurface volume calculations have been included in Appendix G.

VII. FINDINGS

The preliminary hydrology and hydraulic analyses evaluated the proposed development to determine the necessary drainage improvements required to flood protect the project site and address HCOC mitigation. It has been concluded that:

1. The storm drain systems will adequately convey the peak 100-year flow rates.
2. The proposed modular wetlands will adequately treat the required BMP Design Flow Rates.
3. The proposed subsurface basins will adequately address the hydrologic conditions of concern consistent with the Water Quality management Plan.

VII. REFERENCES

1. Riverside County Flood Control and Water Conservation District Hydrology Manual, April 1978.
2. Riverside County Flood Control and Water Conservation District Design Handbook for Low Impact Development Best Management Practices, June 2011

FIGURES

FIGURE 1: VICINITY MAP



0 800 1600 Feet

SADDLEBACK INDUSTRIAL
VICINITY MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

FIGURE 1

Drawing Name: O:\292.01.20\Engineering\Hydrology_Plan\Exhibits\Figure 1 - Vicinity Map.dwg
Last Opened: Mar 31, 2021 - 9:53am by jcarver

TABLES

TABLE 1: EXISTING CONDITION MIXED LAND USE AREAS WEIGHTED RUNOFF INDEX AND WEIGHTED PERVIOUS FRACTIONS

AREA A4

AREA (AC)	54.21								
	SOIL A	RI A	SOIL B	RI B	SOIL C	RI C	SOIL D	RI D	AP
1 ACREA	0.116	32	1.935	56	1.428	69	21.951	75	0.8
1/4 ACRE		32	0.45	56	28.099	69	0.231	75	0.4
	0.002		0.04		0.54		0.41		
WEIGHTED RI	70.80								
WEIGHTED AP	0.59								

AREA A6

AREA (AC)	29.2								
	SOIL A	RI A	SOIL B	RI B	SOIL C	RI C	SOIL D	RI D	AP
1 ACREA	2.932	32	4.239	56	0.053	69	5.079	75	0.8
1/4 ACRE	0.303	32	0	56	16.558	69	0.036	75	0.4
	0.111		0.15		0.57		0.18		
WEIGHTED RI	64.06								
WEIGHTED AP	0.57								

AREA A7

AREA (AC)	59.2								
	SOIL A	RI A	SOIL B	RI B	SOIL C	RI C	SOIL D	RI D	AP
1 ACREA	0	32	0	56	8.191	69	19.705	75	0.8
1/4 ACRE		32	1.294	56	28.01	69	2	75	0.4
	0.000		0.02		0.61		0.37		
WEIGHTED RI	70.92								
WEIGHTED AP	0.59								

AREA A8

AREA (AC)	91.99								
	SOIL A	RI A	SOIL B	RI B	SOIL C	RI C	SOIL D	RI D	AP
SCHOOL		32		56	9.654	69		75	0.4
1/4 ACRE		32	4.972	56	77.364	69	0	75	0.4
	0.000		0.05		0.95		0.00		
WEIGHTED RI	68.30								
WEIGHTED AP	0.40								

AREA A15

AREA (AC)	8.27								
	SOIL A	RI A	SOIL B	RI B	SOIL C	RI C	SOIL D	RI D	AP
COMM	0	32	0.084	56	0.821	69		75	0.1
UNDEVELOPED		62	7.286	76	0.079	84		88	0
	0.000		0.89		0.11		0.00		
WEIGHTED RI	75.18								
WEIGHTED AP	0.01								

APPENDICES

APPENDIX A: PRE-PROJECT CONDITION RATIONAL METHOD HYDROLOGY

APPENDIX A.1: AREA "A" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/30/21 File:ARAEX100.out

SADDLEBACK/ELSINORE BUSINESS PARK EXISTING CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 100-YEAR STORM EVENT
AREA TRIBUTARY TO EXISTING TRAPEZOIDAL CHANNEL
FILENAME: ARAEX100

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.450(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 849.000(Ft.)
Top (of initial area) elevation = 1545.000(Ft.)
Bottom (of initial area) elevation = 1454.000(Ft.)
Difference in elevation = 91.000(Ft.)
Slope = 0.10718 s(percent)= 10.72
TC = k(0.480)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.137 min.
Rainfall intensity = 3.094(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.791
Decimal fraction soil group A = 0.100
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.900
RI index for soil(AMC 2) = 70.70
Pervious area fraction = 0.800; Impervious fraction = 0.200
Initial subarea runoff = 22.413(CFS)
Total initial stream area = 9.160(Ac.)
Pervious area fraction = 0.800

++

Process from Point/Station 102.000 to Point/Station 103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 40.995(CFS)
Depth of flow = 0.401(Ft.), Average velocity = 2.684(Ft/s)
******* Irregular Channel Data **********

```
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              1.50
       2             16.92              0.50
       3             56.06              0.00
       4            111.69              0.50
       5            139.71              1.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     40.996(CFS)
  '     '       flow top width =     76.099(Ft.)
  '     '    velocity=    2.684(Ft/s)
  '     '       area =     15.277(Sq.Ft)
  '     '       Froude number =     1.055

Upstream point elevation =  1454.000(Ft.)
Downstream point elevation =  1416.000(Ft.)
Flow length =  1118.000(Ft.)
Travel time  =    6.94 min.
Time of concentration =   18.08 min.
Depth of flow =   0.401(Ft.)
Average velocity =   2.684(Ft/s)
Total irregular channel flow =    40.995(CFS)
Irregular channel normal depth above invert elev. =   0.401(Ft.)
Average velocity of channel(s) =   2.684(Ft/s)
 Adding area flow to channel
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.710
Decimal fraction soil group A = 0.350
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.650
RI index for soil(AMC 2)  =  59.95
Pervious area fraction =  0.800; Impervious fraction =  0.200
Rainfall intensity =      2.488(In/Hr) for a   100.0 year storm
Subarea runoff =     37.099(CFS) for     21.000(Ac.)
Total runoff =     59.512(CFS)        Total area =      30.160(Ac.)
Depth of flow =   0.462(Ft.), Average velocity =   2.946(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =     76.517(CFS)
Depth of flow =   0.593(Ft.), Average velocity =   3.095(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              1.75
       2             36.67              0.75
       3             82.62              0.00
       4            142.04              0.75
       5            179.58              1.75
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     76.517(CFS)
  '     '       flow top width =     83.350(Ft.)
  '     '    velocity=    3.095(Ft/s)
  '     '       area =     24.724(Sq.Ft)
  '     '       Froude number =     1.001

Upstream point elevation =  1416.000(Ft.)
Downstream point elevation =  1372.000(Ft.)
Flow length =  1638.000(Ft.)
Travel time  =    8.82 min.
Time of concentration =   26.90 min.
Depth of flow =   0.593(Ft.)
Average velocity =   3.095(Ft/s)
```

```
Total irregular channel flow =    76.517(CFS)
Irregular channel normal depth above invert elev. =   0.593(Ft.)
Average velocity of channel(s) =   3.095(Ft/s)
 Adding area flow to channel
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.766
Decimal fraction soil group A = 0.030
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.970
RI index for soil(AMC 2)  =  73.71
Pervious area fraction =  0.800; Impervious fraction =  0.200
Rainfall intensity =      2.080(In/Hr) for a   100.0 year storm
Subarea runoff =     33.944(CFS) for     21.300(Ac.)
Total runoff =     93.456(CFS)       Total area =      51.460(Ac.)
Depth of flow =   0.639(Ft.), Average velocity =   3.253(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      108.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =    128.937(CFS)
Depth of flow =   0.588(Ft.), Average velocity =   3.125(Ft/s)
       ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              1.40
       2             39.42              0.40
       3            110.14              0.00
       4            141.80              0.40
       5            191.30              1.40
Manning's 'N' friction factor =   0.035
----------------------------------------------------------------
Sub-Channel flow  =    128.937(CFS)
  '     '       flow top width =    119.067(Ft.)
  '     '    velocity=    3.125(Ft/s)
  '     '       area =     41.255(Sq.Ft)
  '     '       Froude number =     0.936

Upstream point elevation =  1372.000(Ft.)
Downstream point elevation =  1308.000(Ft.)
Flow length =  2874.000(Ft.)
Travel time  =   15.33 min.
Time of concentration =   42.23 min.
Depth of flow =   0.588(Ft.)
Average velocity =   3.125(Ft/s)
Total irregular channel flow =   128.937(CFS)
Irregular channel normal depth above invert elev. =   0.588(Ft.)
Average velocity of channel(s) =   3.125(Ft/s)
 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.770
Decimal fraction soil group A = 0.010
Decimal fraction soil group B = 0.040
Decimal fraction soil group C = 0.540
Decimal fraction soil group D = 0.410
RI index for soil(AMC 2)  =  70.80
Pervious area fraction =  0.590; Impervious fraction =  0.410
Rainfall intensity =      1.698(In/Hr) for a   100.0 year storm
Subarea runoff =     70.901(CFS) for     54.210(Ac.)
Total runoff =    164.357(CFS)       Total area =     105.670(Ac.)
Depth of flow =   0.648(Ft.), Average velocity =   3.384(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      108.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
```

```
Stream flow area =    105.670(Ac.)
Runoff from this stream =    164.357(CFS)
Time of concentration =   42.23 min.
Rainfall intensity =     1.698(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   872.000(Ft.)
Top (of initial area) elevation =  1520.000(Ft.)
Bottom (of initial area) elevation =  1412.000(Ft.)
Difference in elevation =   108.000(Ft.)
Slope =    0.12385  s(percent)=      12.39
TC = k(0.480)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.936 min.
Rainfall intensity =      3.119(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.753
Decimal fraction soil group A = 0.030
Decimal fraction soil group B = 0.590
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.380
RI index for soil(AMC 2)  =  62.50
Pervious area fraction =  0.800; Impervious fraction =  0.200
Initial subarea runoff =     18.486(CFS)
Total initial stream area =        7.870(Ac.)
Pervious area fraction = 0.800


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      107.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =     44.593(CFS)
Depth of flow =   0.469(Ft.), Average velocity =   3.386(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2             27.10              1.00
       3             75.39              0.00
       4             82.61              0.00
       5            123.40              1.00
       6            181.04              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     44.593(CFS)
  '     '       flow top width =     48.971(Ft.)
  '     '    velocity=    3.386(Ft/s)
  '     '       area =     13.168(Sq.Ft)
  '     '       Froude number =     1.151

Upstream point elevation =  1412.000(Ft.)
Downstream point elevation =  1334.000(Ft.)
Flow length =  2127.320(Ft.)
Travel time  =   10.47 min.
Time of concentration =   21.41 min.
Depth of flow =   0.469(Ft.)
Average velocity =   3.386(Ft/s)
Total irregular channel flow =    44.593(CFS)
Irregular channel normal depth above invert elev. =   0.469(Ft.)
Average velocity of channel(s) =   3.386(Ft/s)
 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.774
Decimal fraction soil group A = 0.110
Decimal fraction soil group B = 0.150
Decimal fraction soil group C = 0.570
```

```
Decimal fraction soil group D = 0.170
RI index for soil(AMC 2)  =  64.06
Pervious area fraction =  0.570; Impervious fraction =  0.430
Rainfall intensity =      2.306(In/Hr) for a   100.0 year storm
Subarea runoff =     52.132(CFS) for     29.200(Ac.)
Total runoff =     70.618(CFS)        Total area =      37.070(Ac.)
Depth of flow =   0.570(Ft.), Average velocity =   3.805(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      108.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________________
Estimated mean flow rate at midpoint of channel =    119.976(CFS)
Depth of flow =   0.514(Ft.), Average velocity =   3.765(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2             26.28              1.00
       3             55.38              0.00
       4            104.87              0.00
       5            124.19              1.00
       6            143.11              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =    119.976(CFS)
  '     '       flow top width =     74.398(Ft.)
  '     '    velocity=    3.765(Ft/s)
  '     '       area =     31.866(Sq.Ft)
  '     '       Froude number =     1.014

Upstream point elevation =  1334.000(Ft.)
Downstream point elevation =  1308.000(Ft.)
Flow length =  1067.000(Ft.)
Travel time  =    4.72 min.
Time of concentration =   26.13 min.
Depth of flow =   0.514(Ft.)
Average velocity =   3.765(Ft/s)
Total irregular channel flow =   119.976(CFS)
Irregular channel normal depth above invert elev. =   0.514(Ft.)
Average velocity of channel(s) =   3.765(Ft/s)
 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.791
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.020
Decimal fraction soil group C = 0.610
Decimal fraction soil group D = 0.370
RI index for soil(AMC 2)  =  70.92
Pervious area fraction =  0.590; Impervious fraction =  0.410
Rainfall intensity =      2.108(In/Hr) for a   100.0 year storm
Subarea runoff =     98.657(CFS) for     59.200(Ac.)
Total runoff =    169.275(CFS)        Total area =      96.270(Ac.)
Depth of flow =   0.623(Ft.), Average velocity =   4.204(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      108.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     96.270(Ac.)
Runoff from this stream =    169.275(CFS)
Time of concentration =   26.13 min.
Rainfall intensity =     2.108(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)
```

```
1      164.357     42.23                 1.698
2      169.275     26.13                 2.108
Largest stream flow has longer or shorter time of concentration
Qp =    169.275 + sum of
          Qa          Tb/Ta
         164.357 *    0.619 =    101.698
Qp =    270.972

Total of 2 streams to confluence:
Flow rates before confluence point:
     164.357     169.275
Area of streams before confluence:
      105.670       96.270
Results of confluence:
Total flow rate =    270.972(CFS)
Time of concentration =    26.129 min.
Effective stream area after confluence =    201.940(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =    343.908(CFS)
Depth of flow =   0.958(Ft.), Average velocity =   4.484(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              2.00
       2             13.21              1.00
       3             26.54              0.00
       4             82.89              0.00
       5            119.02              1.00
       6            147.92              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =    343.908(CFS)
  '     '       flow top width =    103.744(Ft.)
  '     '    velocity=    4.484(Ft/s)
  '     '       area =     76.703(Sq.Ft)
  '     '       Froude number =     0.919

Upstream point elevation =  1308.000(Ft.)
Downstream point elevation =  1286.000(Ft.)
Flow length =  1318.000(Ft.)
Travel time  =    4.90 min.
Time of concentration =   31.03 min.
Depth of flow =   0.958(Ft.)
Average velocity =   4.484(Ft/s)
Total irregular channel flow =   343.908(CFS)
Irregular channel normal depth above invert elev. =   0.958(Ft.)
Average velocity of channel(s) =   4.484(Ft/s)
 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.813
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.950
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  68.30
Pervious area fraction =  0.400; Impervious fraction =  0.600
Rainfall intensity =      1.951(In/Hr) for a   100.0 year storm
Subarea runoff =    145.962(CFS) for     91.990(Ac.)
Total runoff =    416.934(CFS)        Total area =     293.930(Ac.)
Depth of flow =   1.061(Ft.), Average velocity =   4.759(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      109.000 to Point/Station      110.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1286.000(Ft.)
Downstream point/station elevation =  1278.000(Ft.)
Pipe length  =   322.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   416.934(CFS)
Nearest computed pipe diameter  =     60.00(In.)
Calculated individual pipe flow  =   416.934(CFS)
Normal flow depth in pipe =   50.06(In.)
Flow top width inside pipe =   44.61(In.)
Critical depth could not be calculated.
Pipe flow velocity =     23.82(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =    31.25 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      110.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.010
Decimal fraction soil group B = 0.150
Decimal fraction soil group C = 0.840
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  66.68
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    31.25 min.
Rainfall intensity =      1.945(In/Hr) for a   100.0 year storm
Subarea runoff =     23.211(CFS) for     13.610(Ac.)
Total runoff =    440.145(CFS)        Total area =     307.540(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      115.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =    446.400(CFS)
Depth of flow =   2.711(Ft.), Average velocity =  10.373(Ft/s)
!!Warning: Water is above left or right bank elevations
       ******* Irregular Channel Data ***********
---------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              1.00
       2              2.81              0.00
       3             13.61              0.00
       4             17.02              1.00
Manning's 'N' friction factor =   0.035
---------------------------------------------------------------
Sub-Channel flow  =    446.400(CFS)
  '     '       flow top width =     17.020(Ft.)
  '     '    velocity=   10.373(Ft/s)
  '     '       area =     43.036(Sq.Ft)
  '     '       Froude number =     1.150

Upstream point elevation =  1278.000(Ft.)
Downstream point elevation =  1262.000(Ft.)
Flow length =   901.000(Ft.)
Travel time  =    1.45 min.
Time of concentration =   32.70 min.
Depth of flow =   2.711(Ft.)
Average velocity =  10.373(Ft/s)
Total irregular channel flow =   446.400(CFS)
Irregular channel normal depth above invert elev. =   2.711(Ft.)
Average velocity of channel(s) =  10.373(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
COMMERCIAL subarea type
```

```
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.840
Decimal fraction soil group C = 0.160
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  58.08
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      1.905(In/Hr) for a   100.0 year storm
Subarea runoff =     12.562(CFS) for      7.580(Ac.)
Total runoff =    452.708(CFS)       Total area =     315.120(Ac.)
Depth of flow =   2.733(Ft.), Average velocity =  10.431(Ft/s)
!!Warning: Water is above left or right bank elevations


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      115.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    315.120(Ac.)
Runoff from this stream =    452.708(CFS)
Time of concentration =   32.70 min.
Rainfall intensity =     1.905(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      112.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   998.000(Ft.)
Top (of initial area) elevation =  1336.000(Ft.)
Bottom (of initial area) elevation =  1310.000(Ft.)
Difference in elevation =    26.000(Ft.)
Slope =    0.02605  s(percent)=       2.61
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.810 min.
Rainfall intensity =      2.905(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.823
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     17.024(CFS)
Total initial stream area =        7.120(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      112.000 to Point/Station      113.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________________
Estimated mean flow rate at midpoint of channel =     25.735(CFS)
Depth of flow =   0.209(Ft.), Average velocity =   2.038(Ft/s)
       ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
       1              0.00              1.00
       2             41.67              0.00
       3             93.14              0.00
       4            138.70              1.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     25.735(CFS)
  '     '       flow top width =     69.661(Ft.)
  '     '    velocity=    2.038(Ft/s)
  '     '       area =     12.631(Sq.Ft)
  '     '       Froude number =     0.843
```

```
Upstream point elevation =  1310.000(Ft.)
Downstream point elevation =  1292.000(Ft.)
Flow length =   802.000(Ft.)
Travel time  =    6.56 min.
Time of concentration =   19.37 min.
Depth of flow =   0.209(Ft.)
Average velocity =   2.038(Ft/s)
Total irregular channel flow =    25.735(CFS)
Irregular channel normal depth above invert elev. =   0.209(Ft.)
Average velocity of channel(s) =   2.038(Ft/s)
 Adding area flow to channel
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.810
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.412(In/Hr) for a   100.0 year storm
Subarea runoff =     17.357(CFS) for      8.880(Ac.)
Total runoff =     34.381(CFS)        Total area =      16.000(Ac.)
Depth of flow =   0.246(Ft.), Average velocity =   2.246(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1292.000(Ft.)
Downstream point/station elevation =  1282.000(Ft.)
Pipe length  =   291.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    34.381(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    34.381(CFS)
Normal flow depth in pipe =   16.55(In.)
Flow top width inside pipe =   22.21(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.90(Ft/s)
Travel time through pipe =    0.33 min.
Time of concentration (TC) =    19.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.882
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    19.70 min.
Rainfall intensity =      2.394(In/Hr) for a   100.0 year storm
Subarea runoff =      6.629(CFS) for      3.140(Ac.)
Total runoff =     41.010(CFS)        Total area =      19.140(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1282.000(Ft.)
End of street segment elevation =  1262.000(Ft.)
Length of street segment  =  1033.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
```

```
Distance from crown to crossfall grade break  =   0.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     46.427(CFS)
Depth of flow =   0.687(Ft.), Average velocity =   5.921(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    9.34(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   5.92(Ft/s)
Travel time =    2.91 min.     TC =   22.60  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.590
Decimal fraction soil group C = 0.410
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  61.33
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.250(In/Hr) for a   100.0 year storm
Subarea runoff =     10.775(CFS) for      5.470(Ac.)
Total runoff =     51.785(CFS)        Total area =      24.610(Ac.)
Street flow at end of street =     51.785(CFS)
Half street flow at end of street =     51.785(CFS)
Depth of flow =   0.709(Ft.), Average velocity =   6.128(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =   10.44(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     24.610(Ac.)
Runoff from this stream =     51.785(CFS)
Time of concentration =   22.60 min.
Rainfall intensity =     2.250(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1      452.708     32.70                1.905
2       51.785     22.60                2.250
Largest stream flow has longer time of concentration
Qp =    452.708 + sum of
          Qb         Ia/Ib
          51.785 *    0.847 =     43.855
Qp =    496.563

Total of 2 streams to confluence:
Flow rates before confluence point:
     452.708      51.785
Area of streams before confluence:
      315.120       24.610
Results of confluence:
Total flow rate =    496.563(CFS)
```

```
Time of concentration =    32.702 min.
Effective stream area after confluence =    339.730(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      116.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1262.000(Ft.)
Downstream point elevation =  1258.000(Ft.)
Channel length thru subarea  =   631.000(Ft.)
Channel base width     =    6.000(Ft.)
Slope or 'Z' of left channel bank =   1.500
Slope or 'Z' of right channel bank =   1.500
Estimated mean flow rate at midpoint of channel =    503.536(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    3.000(Ft.)
Flow(q) thru subarea =    503.536(CFS)
Depth of flow =   3.396(Ft.), Average velocity =  13.449(Ft/s)
!!Warning: Water is above left or right bank elevations
Channel flow top width =   15.000(Ft.)
Flow Velocity =   13.45(Ft/s)
Travel time  =    0.78 min.
Time of concentration =   33.48 min.

Sub-Channel No. 1 Critical depth =      4.188(Ft.)
  '     '       '     Critical flow top width =     15.000(Ft.)
  '     '       '     Critical flow velocity=   10.211(Ft/s)
  '     '       '     Critical flow area =     49.313(Sq.Ft)

ERROR - Channel depth exceeds maximum allowable depth
 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.898
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.890
Decimal fraction soil group C = 0.110
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  75.18
Pervious area fraction =  0.010; Impervious fraction =  0.990
Rainfall intensity =      1.885(In/Hr) for a   100.0 year storm
Subarea runoff =     14.005(CFS) for      8.270(Ac.)
Total runoff =    510.568(CFS)        Total area =     348.000(Ac.)
Depth of flow =   3.417(Ft.), Average velocity =  13.524(Ft/s)
!!Warning: Water is above left or right bank elevations
ERROR - Channel depth exceeds maximum allowable depth

Sub-Channel No. 1 Critical depth =      4.188(Ft.)
  '     '       '     Critical flow top width =     15.000(Ft.)
  '     '       '     Critical flow velocity=   10.354(Ft/s)
  '     '       '     Critical flow area =     49.313(Sq.Ft)

End of computations, total study area =          348.00 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.514
Area averaged RI index number =  68.3
```

APPENDIX A.3: AREA "B" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 11/25/20 File:ARBEX100.out

SADDLEBACK/ELSINORE BUSINESS PARK EXISTING CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 100-YEAR STORM EVENT
AREA TRIBUTARY TO CULVERT AT RIVERSIDE DRIVE
FILENAME: ARBEX100

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.450(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 985.000(Ft.)
Top (of initial area) elevation = 1288.000(Ft.)
Bottom (of initial area) elevation = 1278.000(Ft.)
Difference in elevation = 10.000(Ft.)
Slope = 0.01015 s(percent)= 1.02
TC = k(0.480)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.937 min.
Rainfall intensity = 2.436(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.684
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.800; Impervious fraction = 0.200
Initial subarea runoff = 13.039(CFS)
Total initial stream area = 7.830(Ac.)
Pervious area fraction = 0.800

++

Process from Point/Station 202.000 to Point/Station 203.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1278.000(Ft.)
End of street segment elevation = 1268.000(Ft.)
Length of street segment = 851.000(Ft.)

```
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     28.666(CFS)
Depth of flow =   0.636(Ft.), Average velocity =   4.117(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    6.81(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.000(Ft.)
Flow velocity =   4.12(Ft/s)
Travel time =    3.44 min.     TC =   22.38  min.
 Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.873
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.840
Decimal fraction soil group C = 0.160
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  58.08
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.260(In/Hr) for a   100.0 year storm
Subarea runoff =     31.334(CFS) for     15.880(Ac.)
Total runoff =     44.373(CFS)        Total area =      23.710(Ac.)
Street flow at end of street =     44.373(CFS)
Half street flow at end of street =     44.373(CFS)
Depth of flow =   0.717(Ft.), Average velocity =   4.705(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =   10.83(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)
End of computations, total study area =           23.71 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.331
Area averaged RI index number =  57.4
```

APPENDIX B: POST-PROJECT CONDITION ONISTE RATIONAL METHOD HYDROLOGY

APPENDIX B.1: AREA "A" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/24/21 File:ARAP100.out

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 100-YEAR STORM EVENT
FILENAME: ARAP100

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.450(In/Hr)
Slope of intensity duration curve = 0.4500

++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 574.000(Ft.)
Top (of initial area) elevation = 1273.000(Ft.)
Bottom (of initial area) elevation = 1265.950(Ft.)
Difference in elevation = 7.050(Ft.)
Slope = 0.01228 s(percent)= 1.23
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.180 min.
Rainfall intensity = 3.375(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.660
Decimal fraction soil group C = 0.340
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 60.42
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 6.456(CFS)
Total initial stream area = 2.170(Ac.)
Pervious area fraction = 0.100

++
Process from Point/Station 102.000 to Point/Station 103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1260.500(Ft.)
Downstream point/station elevation = 1260.000(Ft.)
Pipe length = 73.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     6.456(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.456(CFS)
Normal flow depth in pipe =   11.55(In.)
Flow top width inside pipe =   17.26(In.)
Critical Depth =   11.80(In.)
Pipe flow velocity =      5.39(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =     9.41 min.
End of computations, total study area =            2.17 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  60.4
```

APPENDIX B.2: AREA "A" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/24/21 File:ARAP10.out

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 10-YEAR STORM EVENT
FILENAME: ARAP10

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.938(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 574.000(Ft.)
Top (of initial area) elevation = 1273.000(Ft.)
Bottom (of initial area) elevation = 1265.950(Ft.)
Difference in elevation = 7.050(Ft.)
Slope = 0.01228 s(percent)= 1.23
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.180 min.
Rainfall intensity = 2.183(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.660
Decimal fraction soil group C = 0.340
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 60.42
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 4.142(CFS)
Total initial stream area = 2.170(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 102.000 to Point/Station 103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1260.500(Ft.)
Downstream point/station elevation = 1260.000(Ft.)
Pipe length = 73.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     4.142(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     4.142(CFS)
Normal flow depth in pipe =    9.91(In.)
Flow top width inside pipe =   14.20(In.)
Critical Depth =    9.88(In.)
Pipe flow velocity =      4.81(Ft/s)
Travel time through pipe =    0.25 min.
Time of concentration (TC) =     9.43 min.
End of computations, total study area =            2.17 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  60.4
```

APPENDIX B.3: AREA "B" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/26/21 File:ARBP100.out

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 100-YEAR STORM EVENT
FILENAME: ARBP100

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.450(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 344.000(Ft.)
Top (of initial area) elevation = 1268.000(Ft.)
Bottom (of initial area) elevation = 1264.100(Ft.)
Difference in elevation = 3.900(Ft.)
Slope = 0.01134 s(percent)= 1.13
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.601 min.
Rainfall intensity = 3.674(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.880
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 3.395(CFS)
Total initial stream area = 1.050(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 202.000 to Point/Station 204.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1260.000(Ft.)
Downstream point/station elevation = 1259.000(Ft.)
Pipe length = 52.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     3.395(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.395(CFS)
Normal flow depth in pipe =    7.31(In.)
Flow top width inside pipe =   11.71(In.)
Critical Depth =    9.46(In.)
Pipe flow velocity =      6.78(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =     7.73 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      204.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.050(Ac.)
Runoff from this stream =      3.395(CFS)
Time of concentration =    7.73 min.
Rainfall intensity =     3.647(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   222.000(Ft.)
Top (of initial area) elevation =  1265.500(Ft.)
Bottom (of initial area) elevation =  1262.800(Ft.)
Difference in elevation =     2.700(Ft.)
Slope =    0.01216  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.290 min.
Rainfall intensity =      4.001(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.975(CFS)
Total initial stream area =        0.560(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.560(Ac.)
Runoff from this stream =      1.975(CFS)
Time of concentration =    6.29 min.
Rainfall intensity =     4.001(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.395      7.73                 3.647
2        1.975      6.29                 4.001
Largest stream flow has longer time of concentration
Qp =      3.395 + sum of
          Qb         Ia/Ib
           1.975 *    0.912 =      1.800
Qp =      5.195

Total of 2 streams to confluence:
```

```
Flow rates before confluence point:
       3.395       1.975
Area of streams before confluence:
        1.050        0.560
Results of confluence:
Total flow rate =      5.195(CFS)
Time of concentration =     7.728 min.
Effective stream area after confluence =      1.610(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1259.000(Ft.)
Downstream point/station elevation =  1258.900(Ft.)
Pipe length  =     2.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.195(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.195(CFS)
Normal flow depth in pipe =    7.06(In.)
Flow top width inside pipe =   11.81(In.)
Critical Depth =   11.11(In.)
Pipe flow velocity =     10.81(Ft/s)
Travel time through pipe =    0.00 min.
Time of concentration (TC) =     7.73 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      207.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.610(Ac.)
Runoff from this stream =      5.195(CFS)
Time of concentration =    7.73 min.
Rainfall intensity =     3.646(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   465.000(Ft.)
Top (of initial area) elevation =  1274.000(Ft.)
Bottom (of initial area) elevation =  1262.800(Ft.)
Difference in elevation =    11.200(Ft.)
Slope =    0.02409  s(percent)=       2.41
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.375 min.
Rainfall intensity =      3.724(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.870
Decimal fraction soil group C = 0.130
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  57.69
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      5.252(CFS)
Total initial stream area =        1.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1259.000(Ft.)
Downstream point/station elevation =  1258.910(Ft.)
Pipe length  =     3.00(Ft.)   Manning's N = 0.013
```

```
No. of pipes = 1  Required pipe flow  =     5.252(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.252(CFS)
Normal flow depth in pipe =    8.51(In.)
Flow top width inside pipe =   10.90(In.)
Critical Depth =   11.15(In.)
Pipe flow velocity =      8.82(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     7.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      207.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.600(Ac.)
Runoff from this stream =      5.252(CFS)
Time of concentration =    7.38 min.
Rainfall intensity =     3.723(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        5.195      7.73                3.646
2        5.252      7.38                3.723
Largest stream flow has longer or shorter time of concentration
Qp =      5.252 + sum of
          Qa          Tb/Ta
           5.195 *    0.955 =      4.959
Qp =     10.210

Total of 2 streams to confluence:
Flow rates before confluence point:
       5.195       5.252
Area of streams before confluence:
        1.610        1.600
Results of confluence:
Total flow rate =     10.210(CFS)
Time of concentration =     7.380 min.
Effective stream area after confluence =      3.210(Ac.)
End of computations, total study area =            3.21 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.8
```

APPENDIX B.4: AREA "B" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/26/21 File:ARBP10.out

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 10-YEAR STORM EVENT
FILENAME: ARBP10

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.938(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 344.000(Ft.)
Top (of initial area) elevation = 1268.000(Ft.)
Bottom (of initial area) elevation = 1264.100(Ft.)
Difference in elevation = 3.900(Ft.)
Slope = 0.01134 s(percent)= 1.13
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.601 min.
Rainfall intensity = 2.377(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 2.177(CFS)
Total initial stream area = 1.050(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 202.000 to Point/Station 204.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1260.000(Ft.)
Downstream point/station elevation = 1259.000(Ft.)
Pipe length = 52.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     2.177(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.177(CFS)
Normal flow depth in pipe =    7.00(In.)
Flow top width inside pipe =    7.49(In.)
Critical Depth =    7.96(In.)
Pipe flow velocity =      5.91(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =     7.75 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      204.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.050(Ac.)
Runoff from this stream =      2.177(CFS)
Time of concentration =    7.75 min.
Rainfall intensity =     2.356(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   222.000(Ft.)
Top (of initial area) elevation =  1265.500(Ft.)
Bottom (of initial area) elevation =  1262.800(Ft.)
Difference in elevation =     2.700(Ft.)
Slope =    0.01216  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.290 min.
Rainfall intensity =      2.588(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.267(CFS)
Total initial stream area =        0.560(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.560(Ac.)
Runoff from this stream =      1.267(CFS)
Time of concentration =    6.29 min.
Rainfall intensity =     2.588(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        2.177      7.75                2.356
2        1.267      6.29                2.588
Largest stream flow has longer time of concentration
Qp =      2.177 + sum of
          Qb         Ia/Ib
           1.267 *    0.911 =      1.153
Qp =      3.331

Total of 2 streams to confluence:
```

```
Flow rates before confluence point:
       2.177       1.267
Area of streams before confluence:
        1.050        0.560
Results of confluence:
Total flow rate =      3.331(CFS)
Time of concentration =     7.747 min.
Effective stream area after confluence =      1.610(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1259.000(Ft.)
Downstream point/station elevation =  1258.900(Ft.)
Pipe length  =     2.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.331(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     3.331(CFS)
Normal flow depth in pipe =    6.68(In.)
Flow top width inside pipe =    7.87(In.)
Critical depth could not be calculated.
Pipe flow velocity =      9.48(Ft/s)
Travel time through pipe =    0.00 min.
Time of concentration (TC) =     7.75 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      207.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.610(Ac.)
Runoff from this stream =      3.331(CFS)
Time of concentration =    7.75 min.
Rainfall intensity =     2.356(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   465.000(Ft.)
Top (of initial area) elevation =  1274.000(Ft.)
Bottom (of initial area) elevation =  1262.800(Ft.)
Difference in elevation =    11.200(Ft.)
Slope =    0.02409  s(percent)=       2.41
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.375 min.
Rainfall intensity =      2.409(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.870
Decimal fraction soil group C = 0.130
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  57.69
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      3.369(CFS)
Total initial stream area =        1.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1259.000(Ft.)
Downstream point/station elevation =  1258.910(Ft.)
Pipe length  =     3.00(Ft.)   Manning's N = 0.013
```

```
No. of pipes = 1  Required pipe flow  =     3.369(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.369(CFS)
Normal flow depth in pipe =    6.32(In.)
Flow top width inside pipe =   11.98(In.)
Critical Depth =    9.42(In.)
Pipe flow velocity =      8.03(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     7.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      207.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.600(Ac.)
Runoff from this stream =      3.369(CFS)
Time of concentration =    7.38 min.
Rainfall intensity =     2.408(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        3.331      7.75                2.356
2        3.369      7.38                2.408
Largest stream flow has longer or shorter time of concentration
Qp =      3.369 + sum of
          Qa          Tb/Ta
           3.331 *    0.952 =      3.172
Qp =      6.541

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.331       3.369
Area of streams before confluence:
        1.610        1.600
Results of confluence:
Total flow rate =      6.541(CFS)
Time of concentration =     7.381 min.
Effective stream area after confluence =      3.210(Ac.)
End of computations, total study area =            3.21 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.8
```

APPENDIX B.5: AREA "C" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/24/21 File:ARCP100.out

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 100-YEAR STORM EVENT
FILENAME: ARCP100

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.450(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 478.000(Ft.)
Top (of initial area) elevation = 1269.500(Ft.)
Bottom (of initial area) elevation = 1262.740(Ft.)
Difference in elevation = 6.760(Ft.)
Slope = 0.01414 s(percent)= 1.41
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.294 min.
Rainfall intensity = 3.532(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.879
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 5.654(CFS)
Total initial stream area = 1.820(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 301.000 to Point/Station 302.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.879
Decimal fraction soil group A = 0.000

```
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     8.29 min.
Rainfall intensity =      3.532(In/Hr) for a   100.0 year storm
Subarea runoff =      0.155(CFS) for      0.050(Ac.)
Total runoff =      5.809(CFS)        Total area =       1.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1259.000(Ft.)
Downstream point/station elevation =  1258.500(Ft.)
Pipe length  =     6.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.809(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.809(CFS)
Normal flow depth in pipe =    6.46(In.)
Flow top width inside pipe =   11.97(In.)
Critical Depth =   11.39(In.)
Pipe flow velocity =     13.49(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     8.30 min.
End of computations, total study area =            1.87 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

APPENDIX B.6: AREA "C" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 03/24/21 File:ARCP10.out

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS, 10-YEAR STORM EVENT
FILENAME: ARCP10

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6279

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.580(In.)
100 year, 1 hour precipitation = 1.450(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.938(In/Hr)
Slope of intensity duration curve = 0.4500

++

Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 478.000(Ft.)
Top (of initial area) elevation = 1269.500(Ft.)
Bottom (of initial area) elevation = 1262.740(Ft.)
Difference in elevation = 6.760(Ft.)
Slope = 0.01414 s(percent)= 1.41
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.294 min.
Rainfall intensity = 2.285(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 3.625(CFS)
Total initial stream area = 1.820(Ac.)
Pervious area fraction = 0.100

++

Process from Point/Station 301.000 to Point/Station 302.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000

```
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     8.29 min.
Rainfall intensity =      2.285(In/Hr) for a    10.0 year storm
Subarea runoff =      0.100(CFS) for      0.050(Ac.)
Total runoff =      3.725(CFS)        Total area =       1.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1259.000(Ft.)
Downstream point/station elevation =  1258.500(Ft.)
Pipe length  =     6.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.725(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     3.725(CFS)
Normal flow depth in pipe =    5.98(In.)
Flow top width inside pipe =    8.50(In.)
Critical depth could not be calculated.
Pipe flow velocity =     11.95(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     8.30 min.
End of computations, total study area =            1.87 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

APPENDIX C: PRE-PROJECT CONDITION UNIT HYDROGRAPH HYDROLOGY CALCULATIONS

APPENDIX C.1: AREA "A" – 2-YEAR, 24-HOUR STORM EVENT

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 03/26/21 File: ARAEX242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6279

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SADDLEBACK INDUSTRIAL PRE-PROJECT CONDITION HYDROLOGY
UNIT HYDROGRAPH ANALYSIS, 2-YEAR STORM EVENT
FILENAME: ARAEX

Drainage Area = 2.17(Ac.) = 0.003 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 2.17(Ac.) = 0.003 Sq. Mi.
Length along longest watercourse = 574.00(Ft.)
Length along longest watercourse measured to centroid = 326.00(Ft.)
Length along longest watercourse = 0.109 Mi.
Length along longest watercourse measured to centroid = 0.062 Mi.
Difference in elevation = 13.00(Ft.)
Slope along watercourse = 119.5819 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.043 Hr.
Lag time = 2.60 Min.
25% of lag time = 0.65 Min.
40% of lag time = 1.04 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.17	2.50	5.42

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.17	6.50	14.11

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.170	78.76	0.000

Total Area Entered = 2.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.8	61.5	0.454	0.000	0.454	1.000	0.454
					Sum (F) =	0.454

Area averaged mean soil loss (F) (In/Hr) = 0.454
Minimum soil loss rate ((In/Hr)) = 0.227
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	192.325	42.043	0.919
2	0.167	384.650	43.907	0.960
3	0.250	576.974	9.114	0.199
4	0.333	769.299	3.606	0.079
5	0.417	961.624	1.330	0.029
			Sum = 100.000	Sum= 2.187

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.804)	0.018	0.002
2	0.17	0.07	0.020	(0.801)	0.018	0.002
3	0.25	0.07	0.020	(0.798)	0.018	0.002
4	0.33	0.10	0.030	(0.795)	0.027	0.003
5	0.42	0.10	0.030	(0.792)	0.027	0.003
6	0.50	0.10	0.030	(0.789)	0.027	0.003
7	0.58	0.10	0.030	(0.786)	0.027	0.003
8	0.67	0.10	0.030	(0.783)	0.027	0.003
9	0.75	0.10	0.030	(0.780)	0.027	0.003
10	0.83	0.13	0.040	(0.776)	0.036	0.004
11	0.92	0.13	0.040	(0.773)	0.036	0.004
12	1.00	0.13	0.040	(0.770)	0.036	0.004
13	1.08	0.10	0.030	(0.767)	0.027	0.003
14	1.17	0.10	0.030	(0.764)	0.027	0.003
15	1.25	0.10	0.030	(0.761)	0.027	0.003
16	1.33	0.10	0.030	(0.758)	0.027	0.003
17	1.42	0.10	0.030	(0.755)	0.027	0.003
18	1.50	0.10	0.030	(0.752)	0.027	0.003
19	1.58	0.10	0.030	(0.749)	0.027	0.003
20	1.67	0.10	0.030	(0.746)	0.027	0.003
21	1.75	0.10	0.030	(0.743)	0.027	0.003
22	1.83	0.13	0.040	(0.740)	0.036	0.004
23	1.92	0.13	0.040	(0.737)	0.036	0.004
24	2.00	0.13	0.040	(0.734)	0.036	0.004
25	2.08	0.13	0.040	(0.731)	0.036	0.004
26	2.17	0.13	0.040	(0.728)	0.036	0.004
27	2.25	0.13	0.040	(0.725)	0.036	0.004
28	2.33	0.13	0.040	(0.722)	0.036	0.004
29	2.42	0.13	0.040	(0.719)	0.036	0.004
30	2.50	0.13	0.040	(0.717)	0.036	0.004
31	2.58	0.17	0.050	(0.714)	0.045	0.005
32	2.67	0.17	0.050	(0.711)	0.045	0.005
33	2.75	0.17	0.050	(0.708)	0.045	0.005
34	2.83	0.17	0.050	(0.705)	0.045	0.005
35	2.92	0.17	0.050	(0.702)	0.045	0.005
36	3.00	0.17	0.050	(0.699)	0.045	0.005
37	3.08	0.17	0.050	(0.696)	0.045	0.005

38	3.17	0.17	0.050	(0.693)	0.045	0.005
39	3.25	0.17	0.050	(0.690)	0.045	0.005
40	3.33	0.17	0.050	(0.687)	0.045	0.005
41	3.42	0.17	0.050	(0.685)	0.045	0.005
42	3.50	0.17	0.050	(0.682)	0.045	0.005
43	3.58	0.17	0.050	(0.679)	0.045	0.005
44	3.67	0.17	0.050	(0.676)	0.045	0.005
45	3.75	0.17	0.050	(0.673)	0.045	0.005
46	3.83	0.20	0.060	(0.670)	0.054	0.006
47	3.92	0.20	0.060	(0.667)	0.054	0.006
48	4.00	0.20	0.060	(0.665)	0.054	0.006
49	4.08	0.20	0.060	(0.662)	0.054	0.006
50	4.17	0.20	0.060	(0.659)	0.054	0.006
51	4.25	0.20	0.060	(0.656)	0.054	0.006
52	4.33	0.23	0.070	(0.653)	0.063	0.007
53	4.42	0.23	0.070	(0.651)	0.063	0.007
54	4.50	0.23	0.070	(0.648)	0.063	0.007
55	4.58	0.23	0.070	(0.645)	0.063	0.007
56	4.67	0.23	0.070	(0.642)	0.063	0.007
57	4.75	0.23	0.070	(0.640)	0.063	0.007
58	4.83	0.27	0.080	(0.637)	0.072	0.008
59	4.92	0.27	0.080	(0.634)	0.072	0.008
60	5.00	0.27	0.080	(0.631)	0.072	0.008
61	5.08	0.20	0.060	(0.629)	0.054	0.006
62	5.17	0.20	0.060	(0.626)	0.054	0.006
63	5.25	0.20	0.060	(0.623)	0.054	0.006
64	5.33	0.23	0.070	(0.620)	0.063	0.007
65	5.42	0.23	0.070	(0.618)	0.063	0.007
66	5.50	0.23	0.070	(0.615)	0.063	0.007
67	5.58	0.27	0.080	(0.612)	0.072	0.008
68	5.67	0.27	0.080	(0.610)	0.072	0.008
69	5.75	0.27	0.080	(0.607)	0.072	0.008
70	5.83	0.27	0.080	(0.604)	0.072	0.008
71	5.92	0.27	0.080	(0.602)	0.072	0.008
72	6.00	0.27	0.080	(0.599)	0.072	0.008
73	6.08	0.30	0.090	(0.596)	0.081	0.009
74	6.17	0.30	0.090	(0.594)	0.081	0.009
75	6.25	0.30	0.090	(0.591)	0.081	0.009
76	6.33	0.30	0.090	(0.588)	0.081	0.009
77	6.42	0.30	0.090	(0.586)	0.081	0.009
78	6.50	0.30	0.090	(0.583)	0.081	0.009
79	6.58	0.33	0.100	(0.580)	0.090	0.010
80	6.67	0.33	0.100	(0.578)	0.090	0.010
81	6.75	0.33	0.100	(0.575)	0.090	0.010
82	6.83	0.33	0.100	(0.573)	0.090	0.010
83	6.92	0.33	0.100	(0.570)	0.090	0.010
84	7.00	0.33	0.100	(0.567)	0.090	0.010
85	7.08	0.33	0.100	(0.565)	0.090	0.010
86	7.17	0.33	0.100	(0.562)	0.090	0.010
87	7.25	0.33	0.100	(0.560)	0.090	0.010
88	7.33	0.37	0.110	(0.557)	0.099	0.011
89	7.42	0.37	0.110	(0.555)	0.099	0.011
90	7.50	0.37	0.110	(0.552)	0.099	0.011
91	7.58	0.40	0.120	(0.549)	0.108	0.012
92	7.67	0.40	0.120	(0.547)	0.108	0.012
93	7.75	0.40	0.120	(0.544)	0.108	0.012
94	7.83	0.43	0.130	(0.542)	0.117	0.013
95	7.92	0.43	0.130	(0.539)	0.117	0.013
96	8.00	0.43	0.130	(0.537)	0.117	0.013
97	8.08	0.50	0.150	(0.534)	0.135	0.015
98	8.17	0.50	0.150	(0.532)	0.135	0.015
99	8.25	0.50	0.150	(0.529)	0.135	0.015
100	8.33	0.50	0.150	(0.527)	0.135	0.015
101	8.42	0.50	0.150	(0.525)	0.135	0.015
102	8.50	0.50	0.150	(0.522)	0.135	0.015
103	8.58	0.53	0.160	(0.520)	0.144	0.016
104	8.67	0.53	0.160	(0.517)	0.144	0.016
105	8.75	0.53	0.160	(0.515)	0.144	0.016
106	8.83	0.57	0.170	(0.512)	0.153	0.017
107	8.92	0.57	0.170	(0.510)	0.153	0.017
108	9.00	0.57	0.170	(0.507)	0.153	0.017

109	9.08	0.63	0.190	(0.505)	0.171	0.019
110	9.17	0.63	0.190	(0.503)	0.171	0.019
111	9.25	0.63	0.190	(0.500)	0.171	0.019
112	9.33	0.67	0.200	(0.498)	0.180	0.020
113	9.42	0.67	0.200	(0.496)	0.180	0.020
114	9.50	0.67	0.200	(0.493)	0.180	0.020
115	9.58	0.70	0.210	(0.491)	0.189	0.021
116	9.67	0.70	0.210	(0.488)	0.189	0.021
117	9.75	0.70	0.210	(0.486)	0.189	0.021
118	9.83	0.73	0.220	(0.484)	0.198	0.022
119	9.92	0.73	0.220	(0.481)	0.198	0.022
120	10.00	0.73	0.220	(0.479)	0.198	0.022
121	10.08	0.50	0.150	(0.477)	0.135	0.015
122	10.17	0.50	0.150	(0.474)	0.135	0.015
123	10.25	0.50	0.150	(0.472)	0.135	0.015
124	10.33	0.50	0.150	(0.470)	0.135	0.015
125	10.42	0.50	0.150	(0.468)	0.135	0.015
126	10.50	0.50	0.150	(0.465)	0.135	0.015
127	10.58	0.67	0.200	(0.463)	0.180	0.020
128	10.67	0.67	0.200	(0.461)	0.180	0.020
129	10.75	0.67	0.200	(0.459)	0.180	0.020
130	10.83	0.67	0.200	(0.456)	0.180	0.020
131	10.92	0.67	0.200	(0.454)	0.180	0.020
132	11.00	0.67	0.200	(0.452)	0.180	0.020
133	11.08	0.63	0.190	(0.450)	0.171	0.019
134	11.17	0.63	0.190	(0.447)	0.171	0.019
135	11.25	0.63	0.190	(0.445)	0.171	0.019
136	11.33	0.63	0.190	(0.443)	0.171	0.019
137	11.42	0.63	0.190	(0.441)	0.171	0.019
138	11.50	0.63	0.190	(0.439)	0.171	0.019
139	11.58	0.57	0.170	(0.436)	0.153	0.017
140	11.67	0.57	0.170	(0.434)	0.153	0.017
141	11.75	0.57	0.170	(0.432)	0.153	0.017
142	11.83	0.60	0.180	(0.430)	0.162	0.018
143	11.92	0.60	0.180	(0.428)	0.162	0.018
144	12.00	0.60	0.180	(0.426)	0.162	0.018
145	12.08	0.83	0.250	(0.423)	0.225	0.025
146	12.17	0.83	0.250	(0.421)	0.225	0.025
147	12.25	0.83	0.250	(0.419)	0.225	0.025
148	12.33	0.87	0.260	(0.417)	0.234	0.026
149	12.42	0.87	0.260	(0.415)	0.234	0.026
150	12.50	0.87	0.260	(0.413)	0.234	0.026
151	12.58	0.93	0.280	(0.411)	0.252	0.028
152	12.67	0.93	0.280	(0.409)	0.252	0.028
153	12.75	0.93	0.280	(0.407)	0.252	0.028
154	12.83	0.97	0.290	(0.405)	0.261	0.029
155	12.92	0.97	0.290	(0.403)	0.261	0.029
156	13.00	0.97	0.290	(0.401)	0.261	0.029
157	13.08	1.13	0.340	(0.399)	0.306	0.034
158	13.17	1.13	0.340	(0.397)	0.306	0.034
159	13.25	1.13	0.340	(0.395)	0.306	0.034
160	13.33	1.13	0.340	(0.393)	0.306	0.034
161	13.42	1.13	0.340	(0.391)	0.306	0.034
162	13.50	1.13	0.340	(0.389)	0.306	0.034
163	13.58	0.77	0.230	(0.387)	0.207	0.023
164	13.67	0.77	0.230	(0.385)	0.207	0.023
165	13.75	0.77	0.230	(0.383)	0.207	0.023
166	13.83	0.77	0.230	(0.381)	0.207	0.023
167	13.92	0.77	0.230	(0.379)	0.207	0.023
168	14.00	0.77	0.230	(0.377)	0.207	0.023
169	14.08	0.90	0.270	(0.375)	0.243	0.027
170	14.17	0.90	0.270	(0.373)	0.243	0.027
171	14.25	0.90	0.270	(0.371)	0.243	0.027
172	14.33	0.87	0.260	(0.369)	0.234	0.026
173	14.42	0.87	0.260	(0.367)	0.234	0.026
174	14.50	0.87	0.260	(0.365)	0.234	0.026
175	14.58	0.87	0.260	(0.364)	0.234	0.026
176	14.67	0.87	0.260	(0.362)	0.234	0.026
177	14.75	0.87	0.260	(0.360)	0.234	0.026
178	14.83	0.83	0.250	(0.358)	0.225	0.025
179	14.92	0.83	0.250	(0.356)	0.225	0.025

180	15.00	0.83	0.250	(0.354)	0.225	0.025
181	15.08	0.80	0.240	(0.353)	0.216	0.024
182	15.17	0.80	0.240	(0.351)	0.216	0.024
183	15.25	0.80	0.240	(0.349)	0.216	0.024
184	15.33	0.77	0.230	(0.347)	0.207	0.023
185	15.42	0.77	0.230	(0.345)	0.207	0.023
186	15.50	0.77	0.230	(0.344)	0.207	0.023
187	15.58	0.63	0.190	(0.342)	0.171	0.019
188	15.67	0.63	0.190	(0.340)	0.171	0.019
189	15.75	0.63	0.190	(0.338)	0.171	0.019
190	15.83	0.63	0.190	(0.337)	0.171	0.019
191	15.92	0.63	0.190	(0.335)	0.171	0.019
192	16.00	0.63	0.190	(0.333)	0.171	0.019
193	16.08	0.13	0.040	(0.331)	0.036	0.004
194	16.17	0.13	0.040	(0.330)	0.036	0.004
195	16.25	0.13	0.040	(0.328)	0.036	0.004
196	16.33	0.13	0.040	(0.326)	0.036	0.004
197	16.42	0.13	0.040	(0.325)	0.036	0.004
198	16.50	0.13	0.040	(0.323)	0.036	0.004
199	16.58	0.10	0.030	(0.321)	0.027	0.003
200	16.67	0.10	0.030	(0.320)	0.027	0.003
201	16.75	0.10	0.030	(0.318)	0.027	0.003
202	16.83	0.10	0.030	(0.317)	0.027	0.003
203	16.92	0.10	0.030	(0.315)	0.027	0.003
204	17.00	0.10	0.030	(0.313)	0.027	0.003
205	17.08	0.17	0.050	(0.312)	0.045	0.005
206	17.17	0.17	0.050	(0.310)	0.045	0.005
207	17.25	0.17	0.050	(0.309)	0.045	0.005
208	17.33	0.17	0.050	(0.307)	0.045	0.005
209	17.42	0.17	0.050	(0.306)	0.045	0.005
210	17.50	0.17	0.050	(0.304)	0.045	0.005
211	17.58	0.17	0.050	(0.303)	0.045	0.005
212	17.67	0.17	0.050	(0.301)	0.045	0.005
213	17.75	0.17	0.050	(0.300)	0.045	0.005
214	17.83	0.13	0.040	(0.298)	0.036	0.004
215	17.92	0.13	0.040	(0.297)	0.036	0.004
216	18.00	0.13	0.040	(0.295)	0.036	0.004
217	18.08	0.13	0.040	(0.294)	0.036	0.004
218	18.17	0.13	0.040	(0.292)	0.036	0.004
219	18.25	0.13	0.040	(0.291)	0.036	0.004
220	18.33	0.13	0.040	(0.289)	0.036	0.004
221	18.42	0.13	0.040	(0.288)	0.036	0.004
222	18.50	0.13	0.040	(0.287)	0.036	0.004
223	18.58	0.10	0.030	(0.285)	0.027	0.003
224	18.67	0.10	0.030	(0.284)	0.027	0.003
225	18.75	0.10	0.030	(0.282)	0.027	0.003
226	18.83	0.07	0.020	(0.281)	0.018	0.002
227	18.92	0.07	0.020	(0.280)	0.018	0.002
228	19.00	0.07	0.020	(0.278)	0.018	0.002
229	19.08	0.10	0.030	(0.277)	0.027	0.003
230	19.17	0.10	0.030	(0.276)	0.027	0.003
231	19.25	0.10	0.030	(0.274)	0.027	0.003
232	19.33	0.13	0.040	(0.273)	0.036	0.004
233	19.42	0.13	0.040	(0.272)	0.036	0.004
234	19.50	0.13	0.040	(0.271)	0.036	0.004
235	19.58	0.10	0.030	(0.269)	0.027	0.003
236	19.67	0.10	0.030	(0.268)	0.027	0.003
237	19.75	0.10	0.030	(0.267)	0.027	0.003
238	19.83	0.07	0.020	(0.266)	0.018	0.002
239	19.92	0.07	0.020	(0.265)	0.018	0.002
240	20.00	0.07	0.020	(0.263)	0.018	0.002
241	20.08	0.10	0.030	(0.262)	0.027	0.003
242	20.17	0.10	0.030	(0.261)	0.027	0.003
243	20.25	0.10	0.030	(0.260)	0.027	0.003
244	20.33	0.10	0.030	(0.259)	0.027	0.003
245	20.42	0.10	0.030	(0.258)	0.027	0.003
246	20.50	0.10	0.030	(0.257)	0.027	0.003
247	20.58	0.10	0.030	(0.256)	0.027	0.003
248	20.67	0.10	0.030	(0.255)	0.027	0.003
249	20.75	0.10	0.030	(0.253)	0.027	0.003
250	20.83	0.07	0.020	(0.252)	0.018	0.002

```
251  20.92     0.07      0.020       (  0.251)       0.018        0.002
252  21.00     0.07      0.020       (  0.250)       0.018        0.002
253  21.08     0.10      0.030       (  0.249)       0.027        0.003
254  21.17     0.10      0.030       (  0.248)       0.027        0.003
255  21.25     0.10      0.030       (  0.247)       0.027        0.003
256  21.33     0.07      0.020       (  0.247)       0.018        0.002
257  21.42     0.07      0.020       (  0.246)       0.018        0.002
258  21.50     0.07      0.020       (  0.245)       0.018        0.002
259  21.58     0.10      0.030       (  0.244)       0.027        0.003
260  21.67     0.10      0.030       (  0.243)       0.027        0.003
261  21.75     0.10      0.030       (  0.242)       0.027        0.003
262  21.83     0.07      0.020       (  0.241)       0.018        0.002
263  21.92     0.07      0.020       (  0.240)       0.018        0.002
264  22.00     0.07      0.020       (  0.240)       0.018        0.002
265  22.08     0.10      0.030       (  0.239)       0.027        0.003
266  22.17     0.10      0.030       (  0.238)       0.027        0.003
267  22.25     0.10      0.030       (  0.237)       0.027        0.003
268  22.33     0.07      0.020       (  0.236)       0.018        0.002
269  22.42     0.07      0.020       (  0.236)       0.018        0.002
270  22.50     0.07      0.020       (  0.235)       0.018        0.002
271  22.58     0.07      0.020       (  0.234)       0.018        0.002
272  22.67     0.07      0.020       (  0.234)       0.018        0.002
273  22.75     0.07      0.020       (  0.233)       0.018        0.002
274  22.83     0.07      0.020       (  0.232)       0.018        0.002
275  22.92     0.07      0.020       (  0.232)       0.018        0.002
276  23.00     0.07      0.020       (  0.231)       0.018        0.002
277  23.08     0.07      0.020       (  0.231)       0.018        0.002
278  23.17     0.07      0.020       (  0.230)       0.018        0.002
279  23.25     0.07      0.020       (  0.230)       0.018        0.002
280  23.33     0.07      0.020       (  0.229)       0.018        0.002
281  23.42     0.07      0.020       (  0.229)       0.018        0.002
282  23.50     0.07      0.020       (  0.228)       0.018        0.002
283  23.58     0.07      0.020       (  0.228)       0.018        0.002
284  23.67     0.07      0.020       (  0.228)       0.018        0.002
285  23.75     0.07      0.020       (  0.227)       0.018        0.002
286  23.83     0.07      0.020       (  0.227)       0.018        0.002
287  23.92     0.07      0.020       (  0.227)       0.018        0.002
288  24.00     0.07      0.020       (  0.227)       0.018        0.002
              (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     3.0
      Flood volume = Effective rainfall      0.25(In)
       times area       2.2(Ac.)/[(In)/(Ft.)] =       0.0(Ac.Ft)
      Total soil loss =      2.25(In)
      Total soil loss =     0.407(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =        1969.3 Cubic Feet
      Total soil loss =       17723.4 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.074(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0000      0.00  Q         |         |         |         |
   0+10       0.0000      0.00  Q         |         |         |         |
   0+15       0.0001      0.00  Q         |         |         |         |
   0+20       0.0001      0.01  Q         |         |         |         |
   0+25       0.0001      0.01  Q         |         |         |         |
   0+30       0.0002      0.01  Q         |         |         |         |
   0+35       0.0002      0.01  Q         |         |         |         |
   0+40       0.0003      0.01  Q         |         |         |         |
   0+45       0.0003      0.01  Q         |         |         |         |
   0+50       0.0004      0.01  Q         |         |         |         |
   0+55       0.0004      0.01  Q         |         |         |         |
   1+ 0       0.0005      0.01  Q         |         |         |         |
```

1+ 5	0.0005	0.01	Q	|	|	|	|
1+10	0.0006	0.01	Q	|	|	|	|
1+15	0.0006	0.01	Q	|	|	|	|
1+20	0.0007	0.01	Q	|	|	|	|
1+25	0.0007	0.01	Q	|	|	|	|
1+30	0.0008	0.01	Q	|	|	|	|
1+35	0.0008	0.01	Q	|	|	|	|
1+40	0.0009	0.01	Q	|	|	|	|
1+45	0.0009	0.01	Q	|	|	|	|
1+50	0.0010	0.01	Q	|	|	|	|
1+55	0.0010	0.01	Q	|	|	|	|
2+ 0	0.0011	0.01	Q	|	|	|	|
2+ 5	0.0011	0.01	QV	|	|	|	|
2+10	0.0012	0.01	QV	|	|	|	|
2+15	0.0013	0.01	QV	|	|	|	|
2+20	0.0013	0.01	QV	|	|	|	|
2+25	0.0014	0.01	QV	|	|	|	|
2+30	0.0014	0.01	QV	|	|	|	|
2+35	0.0015	0.01	QV	|	|	|	|
2+40	0.0016	0.01	QV	|	|	|	|
2+45	0.0017	0.01	QV	|	|	|	|
2+50	0.0017	0.01	QV	|	|	|	|
2+55	0.0018	0.01	QV	|	|	|	|
3+ 0	0.0019	0.01	QV	|	|	|	|
3+ 5	0.0020	0.01	QV	|	|	|	|
3+10	0.0020	0.01	QV	|	|	|	|
3+15	0.0021	0.01	QV	|	|	|	|
3+20	0.0022	0.01	QV	|	|	|	|
3+25	0.0023	0.01	Q V	|	|	|	|
3+30	0.0023	0.01	Q V	|	|	|	|
3+35	0.0024	0.01	Q V	|	|	|	|
3+40	0.0025	0.01	Q V	|	|	|	|
3+45	0.0026	0.01	Q V	|	|	|	|
3+50	0.0026	0.01	Q V	|	|	|	|
3+55	0.0027	0.01	Q V	|	|	|	|
4+ 0	0.0028	0.01	Q V	|	|	|	|
4+ 5	0.0029	0.01	Q V	|	|	|	|
4+10	0.0030	0.01	Q V	|	|	|	|
4+15	0.0031	0.01	Q V	|	|	|	|
4+20	0.0032	0.01	Q V	|	|	|	|
4+25	0.0033	0.02	Q V	|	|	|	|
4+30	0.0034	0.02	Q V	|	|	|	|
4+35	0.0035	0.02	Q V	|	|	|	|
4+40	0.0036	0.02	Q V	|	|	|	|
4+45	0.0037	0.02	Q V	|	|	|	|
4+50	0.0038	0.02	Q V	|	|	|	|
4+55	0.0039	0.02	Q V	|	|	|	|
5+ 0	0.0041	0.02	Q V	|	|	|	|
5+ 5	0.0042	0.02	Q V	|	|	|	|
5+10	0.0043	0.01	Q V	|	|	|	|
5+15	0.0044	0.01	Q V	|	|	|	|
5+20	0.0045	0.01	Q V	|	|	|	|
5+25	0.0046	0.02	Q V	|	|	|	|
5+30	0.0047	0.02	Q V	|	|	|	|
5+35	0.0048	0.02	Q V	|	|	|	|
5+40	0.0049	0.02	Q V	|	|	|	|
5+45	0.0050	0.02	Q V	|	|	|	|
5+50	0.0051	0.02	Q V	|	|	|	|
5+55	0.0053	0.02	Q V	|	|	|	|
6+ 0	0.0054	0.02	Q V	|	|	|	|
6+ 5	0.0055	0.02	Q V	|	|	|	|
6+10	0.0056	0.02	Q V	|	|	|	|
6+15	0.0058	0.02	Q V	|	|	|	|
6+20	0.0059	0.02	Q V	|	|	|	|
6+25	0.0060	0.02	Q V	|	|	|	|
6+30	0.0062	0.02	Q V	|	|	|	|
6+35	0.0063	0.02	Q V	|	|	|	|
6+40	0.0065	0.02	Q V	|	|	|	|
6+45	0.0066	0.02	Q V	|	|	|	|
6+50	0.0068	0.02	Q V	|	|	|	|
6+55	0.0069	0.02	Q V	|	|	|	|

7+ 0	0.0071	0.02	Q	V	|	|	|	|
7+ 5	0.0072	0.02	Q	V	|	|	|	|
7+10	0.0074	0.02	Q	V	|	|	|	|
7+15	0.0075	0.02	Q	V	|	|	|	|
7+20	0.0077	0.02	Q	V	|	|	|	|
7+25	0.0078	0.02	Q	V	|	|	|	|
7+30	0.0080	0.02	Q	V	|	|	|	|
7+35	0.0082	0.02	Q	V	|	|	|	|
7+40	0.0084	0.03	Q	V	|	|	|	|
7+45	0.0085	0.03	Q	V	|	|	|	|
7+50	0.0087	0.03	Q	V	|	|	|	|
7+55	0.0089	0.03	Q	V	|	|	|	|
8+ 0	0.0091	0.03	Q	V	|	|	|	|
8+ 5	0.0093	0.03	Q	V	|	|	|	|
8+10	0.0095	0.03	Q	V	|	|	|	|
8+15	0.0098	0.03	Q	V	|	|	|	|
8+20	0.0100	0.03	Q	V	|	|	|	|
8+25	0.0102	0.03	Q	V	|	|	|	|
8+30	0.0104	0.03	Q	V	|	|	|	|
8+35	0.0107	0.03	Q	V	|	|	|	|
8+40	0.0109	0.03	Q	V	|	|	|	|
8+45	0.0112	0.03	Q	V	|	|	|	|
8+50	0.0114	0.04	Q	V	|	|	|	|
8+55	0.0117	0.04	Q	V	|	|	|	|
9+ 0	0.0119	0.04	Q	V	|	|	|	|
9+ 5	0.0122	0.04	Q	V	|	|	|	|
9+10	0.0125	0.04	Q	V	|	|	|	|
9+15	0.0128	0.04	Q	V	|	|	|	|
9+20	0.0130	0.04	Q	V	|	|	|	|
9+25	0.0133	0.04	Q	V	|	|	|	|
9+30	0.0136	0.04	Q	V	|	|	|	|
9+35	0.0140	0.04	Q	V	|	|	|	|
9+40	0.0143	0.05	Q	V	|	|	|	|
9+45	0.0146	0.05	Q	V	|	|	|	|
9+50	0.0149	0.05	Q	V	|	|	|	|
9+55	0.0152	0.05	Q	V	|	|	|	|
10+ 0	0.0156	0.05	Q	V	|	|	|	|
10+ 5	0.0159	0.04	Q	V	|	|	|	|
10+10	0.0161	0.03	Q	V	|	|	|	|
10+15	0.0163	0.03	Q	V	|	|	|	|
10+20	0.0166	0.03	Q	V	|	|	|	|
10+25	0.0168	0.03	Q	V	|	|	|	|
10+30	0.0170	0.03	Q	V	|	|	|	|
10+35	0.0173	0.04	Q	V	|	|	|	|
10+40	0.0176	0.04	Q	V	|	|	|	|
10+45	0.0178	0.04	Q	V	|	|	|	|
10+50	0.0181	0.04	Q	V	|	|	|	|
10+55	0.0185	0.04	Q	V	|	|	|	|
11+ 0	0.0188	0.04	Q	V	|	|	|	|
11+ 5	0.0190	0.04	Q	V	|	|	|	|
11+10	0.0193	0.04	Q	V	|	|	|	|
11+15	0.0196	0.04	Q	V	|	|	|	|
11+20	0.0199	0.04	Q	V	|	|	|	|
11+25	0.0202	0.04	Q	V	|	|	|	|
11+30	0.0205	0.04	Q	V	|	|	|	|
11+35	0.0208	0.04	Q	V	|	|	|	|
11+40	0.0210	0.04	Q	V	|	|	|	|
11+45	0.0213	0.04	Q	V	|	|	|	|
11+50	0.0215	0.04	Q	V	|	|	|	|
11+55	0.0218	0.04	Q	V	|	|	|	|
12+ 0	0.0221	0.04	Q	V	|	|	|	|
12+ 5	0.0224	0.05	Q	V	|	|	|	|
12+10	0.0228	0.05	Q	V	|	|	|	|
12+15	0.0231	0.05	Q	V	|	|	|	|
12+20	0.0235	0.06	Q	V	|	|	|	|
12+25	0.0239	0.06	Q	V	|	|	|	|
12+30	0.0243	0.06	Q	V	|	|	|	|
12+35	0.0247	0.06	Q	V	|	|	|	|
12+40	0.0251	0.06	Q	V	|	|	|	|
12+45	0.0255	0.06	Q	V	|	|	|	|
12+50	0.0260	0.06	Q	V	|	|	|	|

| | | |

```
   18+50       0.0429      0.01  Q          |          |          |       V  |
   18+55       0.0429      0.00  Q          |          |          |       V  |
   19+ 0       0.0429      0.00  Q          |          |          |       V  |
   19+ 5       0.0430      0.01  Q          |          |          |        V |
   19+10       0.0430      0.01  Q          |          |          |        V |
   19+15       0.0430      0.01  Q          |          |          |        V |
   19+20       0.0431      0.01  Q          |          |          |        V |
   19+25       0.0432      0.01  Q          |          |          |        V |
   19+30       0.0432      0.01  Q          |          |          |        V |
   19+35       0.0433      0.01  Q          |          |          |        V |
   19+40       0.0433      0.01  Q          |          |          |        V |
   19+45       0.0434      0.01  Q          |          |          |        V |
   19+50       0.0434      0.01  Q          |          |          |        V |
   19+55       0.0434      0.00  Q          |          |          |        V |
   20+ 0       0.0435      0.00  Q          |          |          |        V |
   20+ 5       0.0435      0.01  Q          |          |          |        V |
   20+10       0.0435      0.01  Q          |          |          |        V |
   20+15       0.0436      0.01  Q          |          |          |        V |
   20+20       0.0436      0.01  Q          |          |          |        V |
   20+25       0.0437      0.01  Q          |          |          |        V |
   20+30       0.0437      0.01  Q          |          |          |        V |
   20+35       0.0438      0.01  Q          |          |          |        V |
   20+40       0.0438      0.01  Q          |          |          |        V |
   20+45       0.0439      0.01  Q          |          |          |        V |
   20+50       0.0439      0.01  Q          |          |          |        V |
   20+55       0.0439      0.00  Q          |          |          |        V |
   21+ 0       0.0440      0.00  Q          |          |          |        V |
   21+ 5       0.0440      0.01  Q          |          |          |        V |
   21+10       0.0440      0.01  Q          |          |          |        V |
   21+15       0.0441      0.01  Q          |          |          |         V|
   21+20       0.0441      0.01  Q          |          |          |         V|
   21+25       0.0442      0.00  Q          |          |          |         V|
   21+30       0.0442      0.00  Q          |          |          |         V|
   21+35       0.0442      0.01  Q          |          |          |         V|
   21+40       0.0443      0.01  Q          |          |          |         V|
   21+45       0.0443      0.01  Q          |          |          |         V|
   21+50       0.0444      0.01  Q          |          |          |         V|
   21+55       0.0444      0.00  Q          |          |          |         V|
   22+ 0       0.0444      0.00  Q          |          |          |         V|
   22+ 5       0.0445      0.01  Q          |          |          |         V|
   22+10       0.0445      0.01  Q          |          |          |         V|
   22+15       0.0445      0.01  Q          |          |          |         V|
   22+20       0.0446      0.01  Q          |          |          |         V|
   22+25       0.0446      0.00  Q          |          |          |         V|
   22+30       0.0446      0.00  Q          |          |          |         V|
   22+35       0.0447      0.00  Q          |          |          |         V|
   22+40       0.0447      0.00  Q          |          |          |         V|
   22+45       0.0447      0.00  Q          |          |          |         V|
   22+50       0.0448      0.00  Q          |          |          |         V|
   22+55       0.0448      0.00  Q          |          |          |         V|
   23+ 0       0.0448      0.00  Q          |          |          |         V|
   23+ 5       0.0449      0.00  Q          |          |          |         V|
   23+10       0.0449      0.00  Q          |          |          |         V|
   23+15       0.0449      0.00  Q          |          |          |         V|
   23+20       0.0449      0.00  Q          |          |          |         V|
   23+25       0.0450      0.00  Q          |          |          |         V|
   23+30       0.0450      0.00  Q          |          |          |         V|
   23+35       0.0450      0.00  Q          |          |          |         V|
   23+40       0.0451      0.00  Q          |          |          |         V|
   23+45       0.0451      0.00  Q          |          |          |         V|
   23+50       0.0451      0.00  Q          |          |          |         V|
   23+55       0.0452      0.00  Q          |          |          |         V|
   24+ 0       0.0452      0.00  Q          |          |          |         V|
   24+ 5       0.0452      0.00  Q          |          |          |         V|
   24+10       0.0452      0.00  Q          |          |          |         V|
   24+15       0.0452      0.00  Q          |          |          |         V|
   24+20       0.0452      0.00  Q          |          |          |         V|
-------------------------------------------------------------------------
```

APPENDIX C.2: AREA "B" – 2-YEAR, 24-HOUR STORM EVENT

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 03/26/21 File: ARBEX242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6279

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SADDLEBACK INDUSTRIAL PRE-PROJECT CONDITION HYDROLOGY
UNIT HYDROGRAPH ANALYSIS, 2-YEAR STORM EVENT
FILENAME: ARBEX

Drainage Area = 3.21(Ac.) = 0.005 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.21(Ac.) = 0.005 Sq. Mi.
Length along longest watercourse = 468.00(Ft.)
Length along longest watercourse measured to centroid = 197.00(Ft.)
Length along longest watercourse = 0.089 Mi.
Length along longest watercourse measured to centroid = 0.037 Mi.
Difference in elevation = 11.20(Ft.)
Slope along watercourse = 126.3590 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.033 Hr.
Lag time = 1.97 Min.
25% of lag time = 0.49 Min.
40% of lag time = 0.79 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.21	2.50	8.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.21	6.50	20.86

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.210	76.53	0.000

Total Area Entered = 3.21(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.5	58.8	0.482	0.000	0.482	1.000	0.482
					Sum (F) =	0.482

Area averaged mean soil loss (F) (In/Hr) = 0.482
Minimum soil loss rate ((In/Hr)) = 0.241
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	254.333	51.455	1.665
2	0.167	508.666	39.787	1.287
3	0.250	762.999	6.880	0.223
4	0.333	1017.332	1.878	0.061
			Sum = 100.000	Sum= 3.235

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.854)	0.018	0.002
2	0.17	0.07	0.020	(0.851)	0.018	0.002
3	0.25	0.07	0.020	(0.848)	0.018	0.002
4	0.33	0.10	0.030	(0.844)	0.027	0.003
5	0.42	0.10	0.030	(0.841)	0.027	0.003
6	0.50	0.10	0.030	(0.838)	0.027	0.003
7	0.58	0.10	0.030	(0.835)	0.027	0.003
8	0.67	0.10	0.030	(0.831)	0.027	0.003
9	0.75	0.10	0.030	(0.828)	0.027	0.003
10	0.83	0.13	0.040	(0.825)	0.036	0.004
11	0.92	0.13	0.040	(0.821)	0.036	0.004
12	1.00	0.13	0.040	(0.818)	0.036	0.004
13	1.08	0.10	0.030	(0.815)	0.027	0.003
14	1.17	0.10	0.030	(0.812)	0.027	0.003
15	1.25	0.10	0.030	(0.809)	0.027	0.003
16	1.33	0.10	0.030	(0.805)	0.027	0.003
17	1.42	0.10	0.030	(0.802)	0.027	0.003
18	1.50	0.10	0.030	(0.799)	0.027	0.003
19	1.58	0.10	0.030	(0.796)	0.027	0.003
20	1.67	0.10	0.030	(0.793)	0.027	0.003
21	1.75	0.10	0.030	(0.789)	0.027	0.003
22	1.83	0.13	0.040	(0.786)	0.036	0.004
23	1.92	0.13	0.040	(0.783)	0.036	0.004
24	2.00	0.13	0.040	(0.780)	0.036	0.004
25	2.08	0.13	0.040	(0.777)	0.036	0.004
26	2.17	0.13	0.040	(0.774)	0.036	0.004
27	2.25	0.13	0.040	(0.770)	0.036	0.004
28	2.33	0.13	0.040	(0.767)	0.036	0.004
29	2.42	0.13	0.040	(0.764)	0.036	0.004
30	2.50	0.13	0.040	(0.761)	0.036	0.004
31	2.58	0.17	0.050	(0.758)	0.045	0.005
32	2.67	0.17	0.050	(0.755)	0.045	0.005
33	2.75	0.17	0.050	(0.752)	0.045	0.005
34	2.83	0.17	0.050	(0.749)	0.045	0.005
35	2.92	0.17	0.050	(0.746)	0.045	0.005
36	3.00	0.17	0.050	(0.742)	0.045	0.005
37	3.08	0.17	0.050	(0.739)	0.045	0.005
38	3.17	0.17	0.050	(0.736)	0.045	0.005

39	3.25	0.17	0.050	(0.733)	0.045	0.005
40	3.33	0.17	0.050	(0.730)	0.045	0.005
41	3.42	0.17	0.050	(0.727)	0.045	0.005
42	3.50	0.17	0.050	(0.724)	0.045	0.005
43	3.58	0.17	0.050	(0.721)	0.045	0.005
44	3.67	0.17	0.050	(0.718)	0.045	0.005
45	3.75	0.17	0.050	(0.715)	0.045	0.005
46	3.83	0.20	0.060	(0.712)	0.054	0.006
47	3.92	0.20	0.060	(0.709)	0.054	0.006
48	4.00	0.20	0.060	(0.706)	0.054	0.006
49	4.08	0.20	0.060	(0.703)	0.054	0.006
50	4.17	0.20	0.060	(0.700)	0.054	0.006
51	4.25	0.20	0.060	(0.697)	0.054	0.006
52	4.33	0.23	0.070	(0.694)	0.063	0.007
53	4.42	0.23	0.070	(0.691)	0.063	0.007
54	4.50	0.23	0.070	(0.688)	0.063	0.007
55	4.58	0.23	0.070	(0.685)	0.063	0.007
56	4.67	0.23	0.070	(0.682)	0.063	0.007
57	4.75	0.23	0.070	(0.679)	0.063	0.007
58	4.83	0.27	0.080	(0.676)	0.072	0.008
59	4.92	0.27	0.080	(0.673)	0.072	0.008
60	5.00	0.27	0.080	(0.671)	0.072	0.008
61	5.08	0.20	0.060	(0.668)	0.054	0.006
62	5.17	0.20	0.060	(0.665)	0.054	0.006
63	5.25	0.20	0.060	(0.662)	0.054	0.006
64	5.33	0.23	0.070	(0.659)	0.063	0.007
65	5.42	0.23	0.070	(0.656)	0.063	0.007
66	5.50	0.23	0.070	(0.653)	0.063	0.007
67	5.58	0.27	0.080	(0.650)	0.072	0.008
68	5.67	0.27	0.080	(0.647)	0.072	0.008
69	5.75	0.27	0.080	(0.645)	0.072	0.008
70	5.83	0.27	0.080	(0.642)	0.072	0.008
71	5.92	0.27	0.080	(0.639)	0.072	0.008
72	6.00	0.27	0.080	(0.636)	0.072	0.008
73	6.08	0.30	0.090	(0.633)	0.081	0.009
74	6.17	0.30	0.090	(0.630)	0.081	0.009
75	6.25	0.30	0.090	(0.628)	0.081	0.009
76	6.33	0.30	0.090	(0.625)	0.081	0.009
77	6.42	0.30	0.090	(0.622)	0.081	0.009
78	6.50	0.30	0.090	(0.619)	0.081	0.009
79	6.58	0.33	0.100	(0.616)	0.090	0.010
80	6.67	0.33	0.100	(0.614)	0.090	0.010
81	6.75	0.33	0.100	(0.611)	0.090	0.010
82	6.83	0.33	0.100	(0.608)	0.090	0.010
83	6.92	0.33	0.100	(0.605)	0.090	0.010
84	7.00	0.33	0.100	(0.603)	0.090	0.010
85	7.08	0.33	0.100	(0.600)	0.090	0.010
86	7.17	0.33	0.100	(0.597)	0.090	0.010
87	7.25	0.33	0.100	(0.594)	0.090	0.010
88	7.33	0.37	0.110	(0.592)	0.099	0.011
89	7.42	0.37	0.110	(0.589)	0.099	0.011
90	7.50	0.37	0.110	(0.586)	0.099	0.011
91	7.58	0.40	0.120	(0.584)	0.108	0.012
92	7.67	0.40	0.120	(0.581)	0.108	0.012
93	7.75	0.40	0.120	(0.578)	0.108	0.012
94	7.83	0.43	0.130	(0.576)	0.117	0.013
95	7.92	0.43	0.130	(0.573)	0.117	0.013
96	8.00	0.43	0.130	(0.570)	0.117	0.013
97	8.08	0.50	0.150	(0.568)	0.135	0.015
98	8.17	0.50	0.150	(0.565)	0.135	0.015
99	8.25	0.50	0.150	(0.562)	0.135	0.015
100	8.33	0.50	0.150	(0.560)	0.135	0.015
101	8.42	0.50	0.150	(0.557)	0.135	0.015
102	8.50	0.50	0.150	(0.555)	0.135	0.015
103	8.58	0.53	0.160	(0.552)	0.144	0.016
104	8.67	0.53	0.160	(0.549)	0.144	0.016
105	8.75	0.53	0.160	(0.547)	0.144	0.016
106	8.83	0.57	0.170	(0.544)	0.153	0.017
107	8.92	0.57	0.170	(0.542)	0.153	0.017
108	9.00	0.57	0.170	(0.539)	0.153	0.017
109	9.08	0.63	0.190	(0.536)	0.171	0.019

110	9.17	0.63	0.190	(0.534)	0.171	0.019
111	9.25	0.63	0.190	(0.531)	0.171	0.019
112	9.33	0.67	0.200	(0.529)	0.180	0.020
113	9.42	0.67	0.200	(0.526)	0.180	0.020
114	9.50	0.67	0.200	(0.524)	0.180	0.020
115	9.58	0.70	0.210	(0.521)	0.189	0.021
116	9.67	0.70	0.210	(0.519)	0.189	0.021
117	9.75	0.70	0.210	(0.516)	0.189	0.021
118	9.83	0.73	0.220	(0.514)	0.198	0.022
119	9.92	0.73	0.220	(0.511)	0.198	0.022
120	10.00	0.73	0.220	(0.509)	0.198	0.022
121	10.08	0.50	0.150	(0.506)	0.135	0.015
122	10.17	0.50	0.150	(0.504)	0.135	0.015
123	10.25	0.50	0.150	(0.502)	0.135	0.015
124	10.33	0.50	0.150	(0.499)	0.135	0.015
125	10.42	0.50	0.150	(0.497)	0.135	0.015
126	10.50	0.50	0.150	(0.494)	0.135	0.015
127	10.58	0.67	0.200	(0.492)	0.180	0.020
128	10.67	0.67	0.200	(0.489)	0.180	0.020
129	10.75	0.67	0.200	(0.487)	0.180	0.020
130	10.83	0.67	0.200	(0.485)	0.180	0.020
131	10.92	0.67	0.200	(0.482)	0.180	0.020
132	11.00	0.67	0.200	(0.480)	0.180	0.020
133	11.08	0.63	0.190	(0.478)	0.171	0.019
134	11.17	0.63	0.190	(0.475)	0.171	0.019
135	11.25	0.63	0.190	(0.473)	0.171	0.019
136	11.33	0.63	0.190	(0.470)	0.171	0.019
137	11.42	0.63	0.190	(0.468)	0.171	0.019
138	11.50	0.63	0.190	(0.466)	0.171	0.019
139	11.58	0.57	0.170	(0.464)	0.153	0.017
140	11.67	0.57	0.170	(0.461)	0.153	0.017
141	11.75	0.57	0.170	(0.459)	0.153	0.017
142	11.83	0.60	0.180	(0.457)	0.162	0.018
143	11.92	0.60	0.180	(0.454)	0.162	0.018
144	12.00	0.60	0.180	(0.452)	0.162	0.018
145	12.08	0.83	0.250	(0.450)	0.225	0.025
146	12.17	0.83	0.250	(0.448)	0.225	0.025
147	12.25	0.83	0.250	(0.445)	0.225	0.025
148	12.33	0.87	0.260	(0.443)	0.234	0.026
149	12.42	0.87	0.260	(0.441)	0.234	0.026
150	12.50	0.87	0.260	(0.439)	0.234	0.026
151	12.58	0.93	0.280	(0.436)	0.252	0.028
152	12.67	0.93	0.280	(0.434)	0.252	0.028
153	12.75	0.93	0.280	(0.432)	0.252	0.028
154	12.83	0.97	0.290	(0.430)	0.261	0.029
155	12.92	0.97	0.290	(0.428)	0.261	0.029
156	13.00	0.97	0.290	(0.426)	0.261	0.029
157	13.08	1.13	0.340	(0.423)	0.306	0.034
158	13.17	1.13	0.340	(0.421)	0.306	0.034
159	13.25	1.13	0.340	(0.419)	0.306	0.034
160	13.33	1.13	0.340	(0.417)	0.306	0.034
161	13.42	1.13	0.340	(0.415)	0.306	0.034
162	13.50	1.13	0.340	(0.413)	0.306	0.034
163	13.58	0.77	0.230	(0.411)	0.207	0.023
164	13.67	0.77	0.230	(0.409)	0.207	0.023
165	13.75	0.77	0.230	(0.406)	0.207	0.023
166	13.83	0.77	0.230	(0.404)	0.207	0.023
167	13.92	0.77	0.230	(0.402)	0.207	0.023
168	14.00	0.77	0.230	(0.400)	0.207	0.023
169	14.08	0.90	0.270	(0.398)	0.243	0.027
170	14.17	0.90	0.270	(0.396)	0.243	0.027
171	14.25	0.90	0.270	(0.394)	0.243	0.027
172	14.33	0.87	0.260	(0.392)	0.234	0.026
173	14.42	0.87	0.260	(0.390)	0.234	0.026
174	14.50	0.87	0.260	(0.388)	0.234	0.026
175	14.58	0.87	0.260	(0.386)	0.234	0.026
176	14.67	0.87	0.260	(0.384)	0.234	0.026
177	14.75	0.87	0.260	(0.382)	0.234	0.026
178	14.83	0.83	0.250	(0.380)	0.225	0.025
179	14.92	0.83	0.250	(0.378)	0.225	0.025
180	15.00	0.83	0.250	(0.376)	0.225	0.025

181	15.08	0.80	0.240	(0.374)	0.216	0.024
182	15.17	0.80	0.240	(0.373)	0.216	0.024
183	15.25	0.80	0.240	(0.371)	0.216	0.024
184	15.33	0.77	0.230	(0.369)	0.207	0.023
185	15.42	0.77	0.230	(0.367)	0.207	0.023
186	15.50	0.77	0.230	(0.365)	0.207	0.023
187	15.58	0.63	0.190	(0.363)	0.171	0.019
188	15.67	0.63	0.190	(0.361)	0.171	0.019
189	15.75	0.63	0.190	(0.359)	0.171	0.019
190	15.83	0.63	0.190	(0.358)	0.171	0.019
191	15.92	0.63	0.190	(0.356)	0.171	0.019
192	16.00	0.63	0.190	(0.354)	0.171	0.019
193	16.08	0.13	0.040	(0.352)	0.036	0.004
194	16.17	0.13	0.040	(0.350)	0.036	0.004
195	16.25	0.13	0.040	(0.348)	0.036	0.004
196	16.33	0.13	0.040	(0.347)	0.036	0.004
197	16.42	0.13	0.040	(0.345)	0.036	0.004
198	16.50	0.13	0.040	(0.343)	0.036	0.004
199	16.58	0.10	0.030	(0.341)	0.027	0.003
200	16.67	0.10	0.030	(0.340)	0.027	0.003
201	16.75	0.10	0.030	(0.338)	0.027	0.003
202	16.83	0.10	0.030	(0.336)	0.027	0.003
203	16.92	0.10	0.030	(0.335)	0.027	0.003
204	17.00	0.10	0.030	(0.333)	0.027	0.003
205	17.08	0.17	0.050	(0.331)	0.045	0.005
206	17.17	0.17	0.050	(0.330)	0.045	0.005
207	17.25	0.17	0.050	(0.328)	0.045	0.005
208	17.33	0.17	0.050	(0.326)	0.045	0.005
209	17.42	0.17	0.050	(0.325)	0.045	0.005
210	17.50	0.17	0.050	(0.323)	0.045	0.005
211	17.58	0.17	0.050	(0.321)	0.045	0.005
212	17.67	0.17	0.050	(0.320)	0.045	0.005
213	17.75	0.17	0.050	(0.318)	0.045	0.005
214	17.83	0.13	0.040	(0.317)	0.036	0.004
215	17.92	0.13	0.040	(0.315)	0.036	0.004
216	18.00	0.13	0.040	(0.313)	0.036	0.004
217	18.08	0.13	0.040	(0.312)	0.036	0.004
218	18.17	0.13	0.040	(0.310)	0.036	0.004
219	18.25	0.13	0.040	(0.309)	0.036	0.004
220	18.33	0.13	0.040	(0.307)	0.036	0.004
221	18.42	0.13	0.040	(0.306)	0.036	0.004
222	18.50	0.13	0.040	(0.304)	0.036	0.004
223	18.58	0.10	0.030	(0.303)	0.027	0.003
224	18.67	0.10	0.030	(0.301)	0.027	0.003
225	18.75	0.10	0.030	(0.300)	0.027	0.003
226	18.83	0.07	0.020	(0.299)	0.018	0.002
227	18.92	0.07	0.020	(0.297)	0.018	0.002
228	19.00	0.07	0.020	(0.296)	0.018	0.002
229	19.08	0.10	0.030	(0.294)	0.027	0.003
230	19.17	0.10	0.030	(0.293)	0.027	0.003
231	19.25	0.10	0.030	(0.292)	0.027	0.003
232	19.33	0.13	0.040	(0.290)	0.036	0.004
233	19.42	0.13	0.040	(0.289)	0.036	0.004
234	19.50	0.13	0.040	(0.288)	0.036	0.004
235	19.58	0.10	0.030	(0.286)	0.027	0.003
236	19.67	0.10	0.030	(0.285)	0.027	0.003
237	19.75	0.10	0.030	(0.284)	0.027	0.003
238	19.83	0.07	0.020	(0.282)	0.018	0.002
239	19.92	0.07	0.020	(0.281)	0.018	0.002
240	20.00	0.07	0.020	(0.280)	0.018	0.002
241	20.08	0.10	0.030	(0.279)	0.027	0.003
242	20.17	0.10	0.030	(0.277)	0.027	0.003
243	20.25	0.10	0.030	(0.276)	0.027	0.003
244	20.33	0.10	0.030	(0.275)	0.027	0.003
245	20.42	0.10	0.030	(0.274)	0.027	0.003
246	20.50	0.10	0.030	(0.273)	0.027	0.003
247	20.58	0.10	0.030	(0.271)	0.027	0.003
248	20.67	0.10	0.030	(0.270)	0.027	0.003
249	20.75	0.10	0.030	(0.269)	0.027	0.003
250	20.83	0.07	0.020	(0.268)	0.018	0.002
251	20.92	0.07	0.020	(0.267)	0.018	0.002

```
252  21.00     0.07      0.020       (  0.266)       0.018        0.002
253  21.08     0.10      0.030       (  0.265)       0.027        0.003
254  21.17     0.10      0.030       (  0.264)       0.027        0.003
255  21.25     0.10      0.030       (  0.263)       0.027        0.003
256  21.33     0.07      0.020       (  0.262)       0.018        0.002
257  21.42     0.07      0.020       (  0.261)       0.018        0.002
258  21.50     0.07      0.020       (  0.260)       0.018        0.002
259  21.58     0.10      0.030       (  0.259)       0.027        0.003
260  21.67     0.10      0.030       (  0.258)       0.027        0.003
261  21.75     0.10      0.030       (  0.257)       0.027        0.003
262  21.83     0.07      0.020       (  0.256)       0.018        0.002
263  21.92     0.07      0.020       (  0.255)       0.018        0.002
264  22.00     0.07      0.020       (  0.254)       0.018        0.002
265  22.08     0.10      0.030       (  0.254)       0.027        0.003
266  22.17     0.10      0.030       (  0.253)       0.027        0.003
267  22.25     0.10      0.030       (  0.252)       0.027        0.003
268  22.33     0.07      0.020       (  0.251)       0.018        0.002
269  22.42     0.07      0.020       (  0.250)       0.018        0.002
270  22.50     0.07      0.020       (  0.250)       0.018        0.002
271  22.58     0.07      0.020       (  0.249)       0.018        0.002
272  22.67     0.07      0.020       (  0.248)       0.018        0.002
273  22.75     0.07      0.020       (  0.248)       0.018        0.002
274  22.83     0.07      0.020       (  0.247)       0.018        0.002
275  22.92     0.07      0.020       (  0.246)       0.018        0.002
276  23.00     0.07      0.020       (  0.246)       0.018        0.002
277  23.08     0.07      0.020       (  0.245)       0.018        0.002
278  23.17     0.07      0.020       (  0.245)       0.018        0.002
279  23.25     0.07      0.020       (  0.244)       0.018        0.002
280  23.33     0.07      0.020       (  0.244)       0.018        0.002
281  23.42     0.07      0.020       (  0.243)       0.018        0.002
282  23.50     0.07      0.020       (  0.243)       0.018        0.002
283  23.58     0.07      0.020       (  0.242)       0.018        0.002
284  23.67     0.07      0.020       (  0.242)       0.018        0.002
285  23.75     0.07      0.020       (  0.242)       0.018        0.002
286  23.83     0.07      0.020       (  0.241)       0.018        0.002
287  23.92     0.07      0.020       (  0.241)       0.018        0.002
288  24.00     0.07      0.020       (  0.241)       0.018        0.002
               (Loss Rate Not Used)
    Sum =     100.0                                    Sum =     3.0
      Flood volume = Effective rainfall      0.25(In)
       times area       3.2(Ac.)/[(In)/(Ft.)] =       0.1(Ac.Ft)
      Total soil loss =      2.25(In)
      Total soil loss =     0.602(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =        2913.1 Cubic Feet
      Total soil loss =       26217.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.110(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0000      0.00  Q         |         |         |         |
   0+10       0.0001      0.01  Q         |         |         |         |
   0+15       0.0001      0.01  Q         |         |         |         |
   0+20       0.0002      0.01  Q         |         |         |         |
   0+25       0.0002      0.01  Q         |         |         |         |
   0+30       0.0003      0.01  Q         |         |         |         |
   0+35       0.0004      0.01  Q         |         |         |         |
   0+40       0.0004      0.01  Q         |         |         |         |
   0+45       0.0005      0.01  Q         |         |         |         |
   0+50       0.0006      0.01  Q         |         |         |         |
   0+55       0.0007      0.01  Q         |         |         |         |
   1+ 0       0.0007      0.01  Q         |         |         |         |
   1+ 5       0.0008      0.01  Q         |         |         |         |
```

1+10	0.0009	0.01	Q				
1+15	0.0010	0.01	Q				
1+20	0.0010	0.01	Q				
1+25	0.0011	0.01	Q				
1+30	0.0012	0.01	Q				
1+35	0.0012	0.01	Q				
1+40	0.0013	0.01	Q				
1+45	0.0014	0.01	Q				
1+50	0.0014	0.01	Q				
1+55	0.0015	0.01	Q				
2+ 0	0.0016	0.01	Q				
2+ 5	0.0017	0.01	QV				
2+10	0.0018	0.01	QV				
2+15	0.0019	0.01	QV				
2+20	0.0020	0.01	QV				
2+25	0.0021	0.01	QV				
2+30	0.0022	0.01	QV				
2+35	0.0023	0.01	QV				
2+40	0.0024	0.02	QV				
2+45	0.0025	0.02	QV				
2+50	0.0026	0.02	QV				
2+55	0.0027	0.02	QV				
3+ 0	0.0028	0.02	QV				
3+ 5	0.0029	0.02	QV				
3+10	0.0030	0.02	QV				
3+15	0.0031	0.02	QV				
3+20	0.0033	0.02	QV				
3+25	0.0034	0.02	Q V				
3+30	0.0035	0.02	Q V				
3+35	0.0036	0.02	Q V				
3+40	0.0037	0.02	Q V				
3+45	0.0038	0.02	Q V				
3+50	0.0039	0.02	Q V				
3+55	0.0041	0.02	Q V				
4+ 0	0.0042	0.02	Q V				
4+ 5	0.0043	0.02	Q V				
4+10	0.0045	0.02	Q V				
4+15	0.0046	0.02	Q V				
4+20	0.0047	0.02	Q V				
4+25	0.0049	0.02	Q V				
4+30	0.0051	0.02	Q V				
4+35	0.0052	0.02	Q V				
4+40	0.0054	0.02	Q V				
4+45	0.0055	0.02	Q V				
4+50	0.0057	0.02	Q V				
4+55	0.0059	0.03	Q V				
5+ 0	0.0060	0.03	Q V				
5+ 5	0.0062	0.02	Q V				
5+10	0.0063	0.02	Q V				
5+15	0.0065	0.02	Q V				
5+20	0.0066	0.02	Q V				
5+25	0.0068	0.02	Q V				
5+30	0.0069	0.02	Q V				
5+35	0.0071	0.02	Q V				
5+40	0.0073	0.03	Q V				
5+45	0.0075	0.03	Q V				
5+50	0.0076	0.03	Q V				
5+55	0.0078	0.03	Q V				
6+ 0	0.0080	0.03	Q V				
6+ 5	0.0082	0.03	Q V				
6+10	0.0084	0.03	Q V				
6+15	0.0086	0.03	Q V				
6+20	0.0088	0.03	Q V				
6+25	0.0090	0.03	Q V				
6+30	0.0092	0.03	Q V				
6+35	0.0094	0.03	Q V				
6+40	0.0096	0.03	Q V				
6+45	0.0098	0.03	Q V				
6+50	0.0101	0.03	Q V				
6+55	0.0103	0.03	Q V				
7+ 0	0.0105	0.03	Q V				

7+ 5	0.0107	0.03	Q	V	|	|	|	|
7+10	0.0109	0.03	Q	V	|	|	|	|
7+15	0.0112	0.03	Q	V	|	|	|	|
7+20	0.0114	0.03	Q	V	|	|	|	|
7+25	0.0116	0.04	Q	V	|	|	|	|
7+30	0.0119	0.04	Q	V	|	|	|	|
7+35	0.0121	0.04	Q	V	|	|	|	|
7+40	0.0124	0.04	Q	V	|	|	|	|
7+45	0.0127	0.04	Q	V	|	|	|	|
7+50	0.0130	0.04	Q	V	|	|	|	|
7+55	0.0132	0.04	Q	V	|	|	|	|
8+ 0	0.0135	0.04	Q	V	|	|	|	|
8+ 5	0.0139	0.05	Q	V	|	|	|	|
8+10	0.0142	0.05	Q	V	|	|	|	|
8+15	0.0145	0.05	Q	V	|	|	|	|
8+20	0.0148	0.05	Q	V	|	|	|	|
8+25	0.0152	0.05	Q	V	|	|	|	|
8+30	0.0155	0.05	Q	V	|	|	|	|
8+35	0.0159	0.05	Q	V	|	|	|	|
8+40	0.0162	0.05	Q	V	|	|	|	|
8+45	0.0166	0.05	Q	V	|	|	|	|
8+50	0.0169	0.05	Q	V	|	|	|	|
8+55	0.0173	0.05	Q	V	|	|	|	|
9+ 0	0.0177	0.05	Q	V	|	|	|	|
9+ 5	0.0181	0.06	Q	V	|	|	|	|
9+10	0.0185	0.06	Q	V	|	|	|	|
9+15	0.0189	0.06	Q	V	|	|	|	|
9+20	0.0194	0.06	Q	V	|	|	|	|
9+25	0.0198	0.06	Q	V	|	|	|	|
9+30	0.0203	0.06	Q	V	|	|	|	|
9+35	0.0207	0.07	Q	V	|	|	|	|
9+40	0.0212	0.07	Q	V	|	|	|	|
9+45	0.0217	0.07	Q	V	|	|	|	|
9+50	0.0221	0.07	Q	V	|	|	|	|
9+55	0.0226	0.07	Q	V	|	|	|	|
10+ 0	0.0231	0.07	Q	V	|	|	|	|
10+ 5	0.0235	0.06	Q	V	|	|	|	|
10+10	0.0239	0.05	Q	V	|	|	|	|
10+15	0.0242	0.05	Q	V	|	|	|	|
10+20	0.0245	0.05	Q	V	|	|	|	|
10+25	0.0249	0.05	Q	V	|	|	|	|
10+30	0.0252	0.05	Q	V	|	|	|	|
10+35	0.0256	0.06	Q	V	|	|	|	|
10+40	0.0260	0.06	Q	V	|	|	|	|
10+45	0.0265	0.06	Q	V	|	|	|	|
10+50	0.0269	0.06	Q	V	|	|	|	|
10+55	0.0274	0.06	Q	V	|	|	|	|
11+ 0	0.0278	0.06	Q	V	|	|	|	|
11+ 5	0.0283	0.06	Q	V	|	|	|	|
11+10	0.0287	0.06	Q	V	|	|	|	|
11+15	0.0291	0.06	Q	V	|	|	|	|
11+20	0.0295	0.06	Q	V	|	|	|	|
11+25	0.0300	0.06	Q	V	|	|	|	|
11+30	0.0304	0.06	Q	V	|	|	|	|
11+35	0.0308	0.06	Q	V	|	|	|	|
11+40	0.0312	0.06	Q	V	|	|	|	|
11+45	0.0315	0.06	Q	V	|	|	|	|
11+50	0.0319	0.06	Q	V	|	|	|	|
11+55	0.0323	0.06	Q	V	|	|	|	|
12+ 0	0.0327	0.06	Q	V	|	|	|	|
12+ 5	0.0332	0.07	Q	V	|	|	|	|
12+10	0.0338	0.08	Q	V	|	|	|	|
12+15	0.0343	0.08	Q	V	|	|	|	|
12+20	0.0349	0.08	Q	V	|	|	|	|
12+25	0.0355	0.08	Q	V	|	|	|	|
12+30	0.0360	0.08	Q	V	|	|	|	|
12+35	0.0366	0.09	Q	V	|	|	|	|
12+40	0.0373	0.09	Q	V	|	|	|	|
12+45	0.0379	0.09	Q	V	|	|	|	|
12+50	0.0385	0.09	Q	V	|	|	|	|
12+55	0.0392	0.09	Q	V	|	|	|	|

13+ 0	0.0398	0.09	Q		V	
13+ 5	0.0405	0.10	Q		V	
13+10	0.0413	0.11	Q		V	
13+15	0.0420	0.11	Q		V	
13+20	0.0428	0.11	Q		V	
13+25	0.0435	0.11	Q		V	
13+30	0.0443	0.11	Q		V	
13+35	0.0449	0.09	Q		V	
13+40	0.0455	0.08	Q		V	
13+45	0.0460	0.08	Q		V	
13+50	0.0465	0.07	Q		V	
13+55	0.0470	0.07	Q		V	
14+ 0	0.0475	0.07	Q		V	
14+ 5	0.0481	0.08	Q		V	
14+10	0.0487	0.09	Q		V	
14+15	0.0493	0.09	Q		V	
14+20	0.0499	0.09	Q		V	
14+25	0.0504	0.08	Q		V	
14+30	0.0510	0.08	Q		V	
14+35	0.0516	0.08	Q		V	
14+40	0.0522	0.08	Q		V	
14+45	0.0528	0.08	Q		V	
14+50	0.0533	0.08	Q		V	
14+55	0.0539	0.08	Q		V	
15+ 0	0.0544	0.08	Q		V	
15+ 5	0.0550	0.08	Q		V	
15+10	0.0555	0.08	Q		V	
15+15	0.0561	0.08	Q		V	
15+20	0.0566	0.08	Q		V	
15+25	0.0571	0.07	Q		V	
15+30	0.0576	0.07	Q		V	
15+35	0.0581	0.07	Q		V	
15+40	0.0585	0.06	Q		V	
15+45	0.0589	0.06	Q		V	
15+50	0.0594	0.06	Q		V	
15+55	0.0598	0.06	Q		V	
16+ 0	0.0602	0.06	Q		V	
16+ 5	0.0605	0.04	Q		V	
16+10	0.0606	0.02	Q		V	
16+15	0.0607	0.01	Q		V	
16+20	0.0608	0.01	Q		V	
16+25	0.0608	0.01	Q		V	
16+30	0.0609	0.01	Q		V	
16+35	0.0610	0.01	Q		V	
16+40	0.0611	0.01	Q		V	
16+45	0.0612	0.01	Q		V	
16+50	0.0612	0.01	Q		V	
16+55	0.0613	0.01	Q		V	
17+ 0	0.0614	0.01	Q		V	
17+ 5	0.0614	0.01	Q		V	
17+10	0.0615	0.02	Q		V	
17+15	0.0617	0.02	Q		V	
17+20	0.0618	0.02	Q		V	
17+25	0.0619	0.02	Q		V	
17+30	0.0620	0.02	Q		V	
17+35	0.0621	0.02	Q		V	
17+40	0.0622	0.02	Q		V	
17+45	0.0623	0.02	Q		V	
17+50	0.0624	0.01	Q		V	
17+55	0.0625	0.01	Q		V	
18+ 0	0.0626	0.01	Q		V	
18+ 5	0.0627	0.01	Q		V	
18+10	0.0628	0.01	Q		V	
18+15	0.0629	0.01	Q		V	
18+20	0.0630	0.01	Q		V	
18+25	0.0631	0.01	Q		V	
18+30	0.0631	0.01	Q		V	
18+35	0.0632	0.01	Q		V	
18+40	0.0633	0.01	Q		V	
18+45	0.0634	0.01	Q		V	
18+50	0.0634	0.01	Q		V	

18+55	0.0635	0.01	Q				V
19+ 0	0.0635	0.01	Q				V
19+ 5	0.0636	0.01	Q				V
19+10	0.0636	0.01	Q				V
19+15	0.0637	0.01	Q				V
19+20	0.0638	0.01	Q				V
19+25	0.0639	0.01	Q				V
19+30	0.0639	0.01	Q				V
19+35	0.0640	0.01	Q				V
19+40	0.0641	0.01	Q				V
19+45	0.0642	0.01	Q				V
19+50	0.0642	0.01	Q				V
19+55	0.0643	0.01	Q				V
20+ 0	0.0643	0.01	Q				V
20+ 5	0.0644	0.01	Q				V
20+10	0.0644	0.01	Q				V
20+15	0.0645	0.01	Q				V
20+20	0.0646	0.01	Q				V
20+25	0.0646	0.01	Q				V
20+30	0.0647	0.01	Q				V
20+35	0.0648	0.01	Q				V
20+40	0.0648	0.01	Q				V
20+45	0.0649	0.01	Q				V
20+50	0.0650	0.01	Q				V
20+55	0.0650	0.01	Q				V
21+ 0	0.0650	0.01	Q				V
21+ 5	0.0651	0.01	Q				V
21+10	0.0652	0.01	Q				V
21+15	0.0652	0.01	Q				V
21+20	0.0653	0.01	Q				V
21+25	0.0653	0.01	Q				V
21+30	0.0654	0.01	Q				V
21+35	0.0654	0.01	Q				V
21+40	0.0655	0.01	Q				V
21+45	0.0656	0.01	Q				V
21+50	0.0656	0.01	Q				V
21+55	0.0657	0.01	Q				V
22+ 0	0.0657	0.01	Q				V
22+ 5	0.0658	0.01	Q				V
22+10	0.0658	0.01	Q				V
22+15	0.0659	0.01	Q				V
22+20	0.0660	0.01	Q				V
22+25	0.0660	0.01	Q				V
22+30	0.0660	0.01	Q				V
22+35	0.0661	0.01	Q				V
22+40	0.0661	0.01	Q				V
22+45	0.0662	0.01	Q				V
22+50	0.0662	0.01	Q				V
22+55	0.0663	0.01	Q				V
23+ 0	0.0663	0.01	Q				V
23+ 5	0.0664	0.01	Q				V
23+10	0.0664	0.01	Q				V
23+15	0.0664	0.01	Q				V
23+20	0.0665	0.01	Q				V
23+25	0.0665	0.01	Q				V
23+30	0.0666	0.01	Q				V
23+35	0.0666	0.01	Q				V
23+40	0.0667	0.01	Q				V
23+45	0.0667	0.01	Q				V
23+50	0.0668	0.01	Q				V
23+55	0.0668	0.01	Q				V
24+ 0	0.0668	0.01	Q				V
24+ 5	0.0669	0.00	Q				V
24+10	0.0669	0.00	Q				V
24+15	0.0669	0.00	Q				V

APPENDIX C.3: AREA "C" – 2-YEAR, 24-HOUR STORM EVENT

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 03/26/21 File: ARCEX242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6279

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SADDLEBACK INDUSTRIAL PRE-PROJECT CONDITION HYDROLOGY
UNIT HYDROGRAPH ANALYSIS, 2-YEAR STORM EVENT
FILENAME: ARCEX

Drainage Area = 1.87(Ac.) = 0.003 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.87(Ac.) = 0.003 Sq. Mi.
Length along longest watercourse = 478.00(Ft.)
Length along longest watercourse measured to centroid = 257.00(Ft.)
Length along longest watercourse = 0.091 Mi.
Length along longest watercourse measured to centroid = 0.049 Mi.
Difference in elevation = 6.76(Ft.)
Slope along watercourse = 74.6711 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.040 Hr.
Lag time = 2.42 Min.
25% of lag time = 0.61 Min.
40% of lag time = 0.97 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.87	2.50	4.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.87	6.50	12.16

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.870	76.00	0.000

Total Area Entered = 1.87(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	58.2	0.488	0.000	0.488	1.000	0.488
					Sum (F) =	0.488

Area averaged mean soil loss (F) (In/Hr) = 0.488
Minimum soil loss rate ((In/Hr)) = 0.244
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	206.362	44.480	0.838
2	0.167	412.724	42.926	0.809
3	0.250	619.086	8.540	0.161
4	0.333	825.448	4.054	0.076
			Sum = 100.000 Sum=	1.885

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.866)	0.018	0.002
2	0.17	0.07	0.020	(0.862)	0.018	0.002
3	0.25	0.07	0.020	(0.859)	0.018	0.002
4	0.33	0.10	0.030	(0.856)	0.027	0.003
5	0.42	0.10	0.030	(0.852)	0.027	0.003
6	0.50	0.10	0.030	(0.849)	0.027	0.003
7	0.58	0.10	0.030	(0.846)	0.027	0.003
8	0.67	0.10	0.030	(0.842)	0.027	0.003
9	0.75	0.10	0.030	(0.839)	0.027	0.003
10	0.83	0.13	0.040	(0.836)	0.036	0.004
11	0.92	0.13	0.040	(0.833)	0.036	0.004
12	1.00	0.13	0.040	(0.829)	0.036	0.004
13	1.08	0.10	0.030	(0.826)	0.027	0.003
14	1.17	0.10	0.030	(0.823)	0.027	0.003
15	1.25	0.10	0.030	(0.819)	0.027	0.003
16	1.33	0.10	0.030	(0.816)	0.027	0.003
17	1.42	0.10	0.030	(0.813)	0.027	0.003
18	1.50	0.10	0.030	(0.810)	0.027	0.003
19	1.58	0.10	0.030	(0.806)	0.027	0.003
20	1.67	0.10	0.030	(0.803)	0.027	0.003
21	1.75	0.10	0.030	(0.800)	0.027	0.003
22	1.83	0.13	0.040	(0.797)	0.036	0.004
23	1.92	0.13	0.040	(0.794)	0.036	0.004
24	2.00	0.13	0.040	(0.790)	0.036	0.004
25	2.08	0.13	0.040	(0.787)	0.036	0.004
26	2.17	0.13	0.040	(0.784)	0.036	0.004
27	2.25	0.13	0.040	(0.781)	0.036	0.004
28	2.33	0.13	0.040	(0.778)	0.036	0.004
29	2.42	0.13	0.040	(0.774)	0.036	0.004
30	2.50	0.13	0.040	(0.771)	0.036	0.004
31	2.58	0.17	0.050	(0.768)	0.045	0.005
32	2.67	0.17	0.050	(0.765)	0.045	0.005
33	2.75	0.17	0.050	(0.762)	0.045	0.005
34	2.83	0.17	0.050	(0.759)	0.045	0.005
35	2.92	0.17	0.050	(0.756)	0.045	0.005
36	3.00	0.17	0.050	(0.752)	0.045	0.005
37	3.08	0.17	0.050	(0.749)	0.045	0.005
38	3.17	0.17	0.050	(0.746)	0.045	0.005

39	3.25	0.17	0.050	(0.743)	0.045	0.005
40	3.33	0.17	0.050	(0.740)	0.045	0.005
41	3.42	0.17	0.050	(0.737)	0.045	0.005
42	3.50	0.17	0.050	(0.734)	0.045	0.005
43	3.58	0.17	0.050	(0.731)	0.045	0.005
44	3.67	0.17	0.050	(0.728)	0.045	0.005
45	3.75	0.17	0.050	(0.725)	0.045	0.005
46	3.83	0.20	0.060	(0.722)	0.054	0.006
47	3.92	0.20	0.060	(0.719)	0.054	0.006
48	4.00	0.20	0.060	(0.715)	0.054	0.006
49	4.08	0.20	0.060	(0.712)	0.054	0.006
50	4.17	0.20	0.060	(0.709)	0.054	0.006
51	4.25	0.20	0.060	(0.706)	0.054	0.006
52	4.33	0.23	0.070	(0.703)	0.063	0.007
53	4.42	0.23	0.070	(0.700)	0.063	0.007
54	4.50	0.23	0.070	(0.697)	0.063	0.007
55	4.58	0.23	0.070	(0.694)	0.063	0.007
56	4.67	0.23	0.070	(0.691)	0.063	0.007
57	4.75	0.23	0.070	(0.688)	0.063	0.007
58	4.83	0.27	0.080	(0.685)	0.072	0.008
59	4.92	0.27	0.080	(0.683)	0.072	0.008
60	5.00	0.27	0.080	(0.680)	0.072	0.008
61	5.08	0.20	0.060	(0.677)	0.054	0.006
62	5.17	0.20	0.060	(0.674)	0.054	0.006
63	5.25	0.20	0.060	(0.671)	0.054	0.006
64	5.33	0.23	0.070	(0.668)	0.063	0.007
65	5.42	0.23	0.070	(0.665)	0.063	0.007
66	5.50	0.23	0.070	(0.662)	0.063	0.007
67	5.58	0.27	0.080	(0.659)	0.072	0.008
68	5.67	0.27	0.080	(0.656)	0.072	0.008
69	5.75	0.27	0.080	(0.653)	0.072	0.008
70	5.83	0.27	0.080	(0.650)	0.072	0.008
71	5.92	0.27	0.080	(0.647)	0.072	0.008
72	6.00	0.27	0.080	(0.645)	0.072	0.008
73	6.08	0.30	0.090	(0.642)	0.081	0.009
74	6.17	0.30	0.090	(0.639)	0.081	0.009
75	6.25	0.30	0.090	(0.636)	0.081	0.009
76	6.33	0.30	0.090	(0.633)	0.081	0.009
77	6.42	0.30	0.090	(0.630)	0.081	0.009
78	6.50	0.30	0.090	(0.628)	0.081	0.009
79	6.58	0.33	0.100	(0.625)	0.090	0.010
80	6.67	0.33	0.100	(0.622)	0.090	0.010
81	6.75	0.33	0.100	(0.619)	0.090	0.010
82	6.83	0.33	0.100	(0.616)	0.090	0.010
83	6.92	0.33	0.100	(0.614)	0.090	0.010
84	7.00	0.33	0.100	(0.611)	0.090	0.010
85	7.08	0.33	0.100	(0.608)	0.090	0.010
86	7.17	0.33	0.100	(0.605)	0.090	0.010
87	7.25	0.33	0.100	(0.602)	0.090	0.010
88	7.33	0.37	0.110	(0.600)	0.099	0.011
89	7.42	0.37	0.110	(0.597)	0.099	0.011
90	7.50	0.37	0.110	(0.594)	0.099	0.011
91	7.58	0.40	0.120	(0.591)	0.108	0.012
92	7.67	0.40	0.120	(0.589)	0.108	0.012
93	7.75	0.40	0.120	(0.586)	0.108	0.012
94	7.83	0.43	0.130	(0.583)	0.117	0.013
95	7.92	0.43	0.130	(0.581)	0.117	0.013
96	8.00	0.43	0.130	(0.578)	0.117	0.013
97	8.08	0.50	0.150	(0.575)	0.135	0.015
98	8.17	0.50	0.150	(0.573)	0.135	0.015
99	8.25	0.50	0.150	(0.570)	0.135	0.015
100	8.33	0.50	0.150	(0.567)	0.135	0.015
101	8.42	0.50	0.150	(0.565)	0.135	0.015
102	8.50	0.50	0.150	(0.562)	0.135	0.015
103	8.58	0.53	0.160	(0.559)	0.144	0.016
104	8.67	0.53	0.160	(0.557)	0.144	0.016
105	8.75	0.53	0.160	(0.554)	0.144	0.016
106	8.83	0.57	0.170	(0.551)	0.153	0.017
107	8.92	0.57	0.170	(0.549)	0.153	0.017
108	9.00	0.57	0.170	(0.546)	0.153	0.017
109	9.08	0.63	0.190	(0.544)	0.171	0.019

110	9.17	0.63	0.190	(0.541)	0.171	0.019
111	9.25	0.63	0.190	(0.539)	0.171	0.019
112	9.33	0.67	0.200	(0.536)	0.180	0.020
113	9.42	0.67	0.200	(0.533)	0.180	0.020
114	9.50	0.67	0.200	(0.531)	0.180	0.020
115	9.58	0.70	0.210	(0.528)	0.189	0.021
116	9.67	0.70	0.210	(0.526)	0.189	0.021
117	9.75	0.70	0.210	(0.523)	0.189	0.021
118	9.83	0.73	0.220	(0.521)	0.198	0.022
119	9.92	0.73	0.220	(0.518)	0.198	0.022
120	10.00	0.73	0.220	(0.516)	0.198	0.022
121	10.08	0.50	0.150	(0.513)	0.135	0.015
122	10.17	0.50	0.150	(0.511)	0.135	0.015
123	10.25	0.50	0.150	(0.508)	0.135	0.015
124	10.33	0.50	0.150	(0.506)	0.135	0.015
125	10.42	0.50	0.150	(0.503)	0.135	0.015
126	10.50	0.50	0.150	(0.501)	0.135	0.015
127	10.58	0.67	0.200	(0.498)	0.180	0.020
128	10.67	0.67	0.200	(0.496)	0.180	0.020
129	10.75	0.67	0.200	(0.494)	0.180	0.020
130	10.83	0.67	0.200	(0.491)	0.180	0.020
131	10.92	0.67	0.200	(0.489)	0.180	0.020
132	11.00	0.67	0.200	(0.486)	0.180	0.020
133	11.08	0.63	0.190	(0.484)	0.171	0.019
134	11.17	0.63	0.190	(0.482)	0.171	0.019
135	11.25	0.63	0.190	(0.479)	0.171	0.019
136	11.33	0.63	0.190	(0.477)	0.171	0.019
137	11.42	0.63	0.190	(0.474)	0.171	0.019
138	11.50	0.63	0.190	(0.472)	0.171	0.019
139	11.58	0.57	0.170	(0.470)	0.153	0.017
140	11.67	0.57	0.170	(0.467)	0.153	0.017
141	11.75	0.57	0.170	(0.465)	0.153	0.017
142	11.83	0.60	0.180	(0.463)	0.162	0.018
143	11.92	0.60	0.180	(0.460)	0.162	0.018
144	12.00	0.60	0.180	(0.458)	0.162	0.018
145	12.08	0.83	0.250	(0.456)	0.225	0.025
146	12.17	0.83	0.250	(0.454)	0.225	0.025
147	12.25	0.83	0.250	(0.451)	0.225	0.025
148	12.33	0.87	0.260	(0.449)	0.234	0.026
149	12.42	0.87	0.260	(0.447)	0.234	0.026
150	12.50	0.87	0.260	(0.445)	0.234	0.026
151	12.58	0.93	0.280	(0.442)	0.252	0.028
152	12.67	0.93	0.280	(0.440)	0.252	0.028
153	12.75	0.93	0.280	(0.438)	0.252	0.028
154	12.83	0.97	0.290	(0.436)	0.261	0.029
155	12.92	0.97	0.290	(0.433)	0.261	0.029
156	13.00	0.97	0.290	(0.431)	0.261	0.029
157	13.08	1.13	0.340	(0.429)	0.306	0.034
158	13.17	1.13	0.340	(0.427)	0.306	0.034
159	13.25	1.13	0.340	(0.425)	0.306	0.034
160	13.33	1.13	0.340	(0.423)	0.306	0.034
161	13.42	1.13	0.340	(0.420)	0.306	0.034
162	13.50	1.13	0.340	(0.418)	0.306	0.034
163	13.58	0.77	0.230	(0.416)	0.207	0.023
164	13.67	0.77	0.230	(0.414)	0.207	0.023
165	13.75	0.77	0.230	(0.412)	0.207	0.023
166	13.83	0.77	0.230	(0.410)	0.207	0.023
167	13.92	0.77	0.230	(0.408)	0.207	0.023
168	14.00	0.77	0.230	(0.406)	0.207	0.023
169	14.08	0.90	0.270	(0.404)	0.243	0.027
170	14.17	0.90	0.270	(0.402)	0.243	0.027
171	14.25	0.90	0.270	(0.399)	0.243	0.027
172	14.33	0.87	0.260	(0.397)	0.234	0.026
173	14.42	0.87	0.260	(0.395)	0.234	0.026
174	14.50	0.87	0.260	(0.393)	0.234	0.026
175	14.58	0.87	0.260	(0.391)	0.234	0.026
176	14.67	0.87	0.260	(0.389)	0.234	0.026
177	14.75	0.87	0.260	(0.387)	0.234	0.026
178	14.83	0.83	0.250	(0.385)	0.225	0.025
179	14.92	0.83	0.250	(0.383)	0.225	0.025
180	15.00	0.83	0.250	(0.381)	0.225	0.025

181	15.08	0.80	0.240	(0.379)	0.216	0.024
182	15.17	0.80	0.240	(0.378)	0.216	0.024
183	15.25	0.80	0.240	(0.376)	0.216	0.024
184	15.33	0.77	0.230	(0.374)	0.207	0.023
185	15.42	0.77	0.230	(0.372)	0.207	0.023
186	15.50	0.77	0.230	(0.370)	0.207	0.023
187	15.58	0.63	0.190	(0.368)	0.171	0.019
188	15.67	0.63	0.190	(0.366)	0.171	0.019
189	15.75	0.63	0.190	(0.364)	0.171	0.019
190	15.83	0.63	0.190	(0.362)	0.171	0.019
191	15.92	0.63	0.190	(0.360)	0.171	0.019
192	16.00	0.63	0.190	(0.359)	0.171	0.019
193	16.08	0.13	0.040	(0.357)	0.036	0.004
194	16.17	0.13	0.040	(0.355)	0.036	0.004
195	16.25	0.13	0.040	(0.353)	0.036	0.004
196	16.33	0.13	0.040	(0.351)	0.036	0.004
197	16.42	0.13	0.040	(0.350)	0.036	0.004
198	16.50	0.13	0.040	(0.348)	0.036	0.004
199	16.58	0.10	0.030	(0.346)	0.027	0.003
200	16.67	0.10	0.030	(0.344)	0.027	0.003
201	16.75	0.10	0.030	(0.343)	0.027	0.003
202	16.83	0.10	0.030	(0.341)	0.027	0.003
203	16.92	0.10	0.030	(0.339)	0.027	0.003
204	17.00	0.10	0.030	(0.337)	0.027	0.003
205	17.08	0.17	0.050	(0.336)	0.045	0.005
206	17.17	0.17	0.050	(0.334)	0.045	0.005
207	17.25	0.17	0.050	(0.332)	0.045	0.005
208	17.33	0.17	0.050	(0.331)	0.045	0.005
209	17.42	0.17	0.050	(0.329)	0.045	0.005
210	17.50	0.17	0.050	(0.327)	0.045	0.005
211	17.58	0.17	0.050	(0.326)	0.045	0.005
212	17.67	0.17	0.050	(0.324)	0.045	0.005
213	17.75	0.17	0.050	(0.322)	0.045	0.005
214	17.83	0.13	0.040	(0.321)	0.036	0.004
215	17.92	0.13	0.040	(0.319)	0.036	0.004
216	18.00	0.13	0.040	(0.318)	0.036	0.004
217	18.08	0.13	0.040	(0.316)	0.036	0.004
218	18.17	0.13	0.040	(0.315)	0.036	0.004
219	18.25	0.13	0.040	(0.313)	0.036	0.004
220	18.33	0.13	0.040	(0.311)	0.036	0.004
221	18.42	0.13	0.040	(0.310)	0.036	0.004
222	18.50	0.13	0.040	(0.308)	0.036	0.004
223	18.58	0.10	0.030	(0.307)	0.027	0.003
224	18.67	0.10	0.030	(0.305)	0.027	0.003
225	18.75	0.10	0.030	(0.304)	0.027	0.003
226	18.83	0.07	0.020	(0.303)	0.018	0.002
227	18.92	0.07	0.020	(0.301)	0.018	0.002
228	19.00	0.07	0.020	(0.300)	0.018	0.002
229	19.08	0.10	0.030	(0.298)	0.027	0.003
230	19.17	0.10	0.030	(0.297)	0.027	0.003
231	19.25	0.10	0.030	(0.295)	0.027	0.003
232	19.33	0.13	0.040	(0.294)	0.036	0.004
233	19.42	0.13	0.040	(0.293)	0.036	0.004
234	19.50	0.13	0.040	(0.291)	0.036	0.004
235	19.58	0.10	0.030	(0.290)	0.027	0.003
236	19.67	0.10	0.030	(0.289)	0.027	0.003
237	19.75	0.10	0.030	(0.287)	0.027	0.003
238	19.83	0.07	0.020	(0.286)	0.018	0.002
239	19.92	0.07	0.020	(0.285)	0.018	0.002
240	20.00	0.07	0.020	(0.284)	0.018	0.002
241	20.08	0.10	0.030	(0.282)	0.027	0.003
242	20.17	0.10	0.030	(0.281)	0.027	0.003
243	20.25	0.10	0.030	(0.280)	0.027	0.003
244	20.33	0.10	0.030	(0.279)	0.027	0.003
245	20.42	0.10	0.030	(0.277)	0.027	0.003
246	20.50	0.10	0.030	(0.276)	0.027	0.003
247	20.58	0.10	0.030	(0.275)	0.027	0.003
248	20.67	0.10	0.030	(0.274)	0.027	0.003
249	20.75	0.10	0.030	(0.273)	0.027	0.003
250	20.83	0.07	0.020	(0.272)	0.018	0.002
251	20.92	0.07	0.020	(0.271)	0.018	0.002

```
252  21.00     0.07      0.020       (  0.270)       0.018        0.002
253  21.08     0.10      0.030       (  0.268)       0.027        0.003
254  21.17     0.10      0.030       (  0.267)       0.027        0.003
255  21.25     0.10      0.030       (  0.266)       0.027        0.003
256  21.33     0.07      0.020       (  0.265)       0.018        0.002
257  21.42     0.07      0.020       (  0.264)       0.018        0.002
258  21.50     0.07      0.020       (  0.263)       0.018        0.002
259  21.58     0.10      0.030       (  0.262)       0.027        0.003
260  21.67     0.10      0.030       (  0.261)       0.027        0.003
261  21.75     0.10      0.030       (  0.261)       0.027        0.003
262  21.83     0.07      0.020       (  0.260)       0.018        0.002
263  21.92     0.07      0.020       (  0.259)       0.018        0.002
264  22.00     0.07      0.020       (  0.258)       0.018        0.002
265  22.08     0.10      0.030       (  0.257)       0.027        0.003
266  22.17     0.10      0.030       (  0.256)       0.027        0.003
267  22.25     0.10      0.030       (  0.255)       0.027        0.003
268  22.33     0.07      0.020       (  0.255)       0.018        0.002
269  22.42     0.07      0.020       (  0.254)       0.018        0.002
270  22.50     0.07      0.020       (  0.253)       0.018        0.002
271  22.58     0.07      0.020       (  0.252)       0.018        0.002
272  22.67     0.07      0.020       (  0.252)       0.018        0.002
273  22.75     0.07      0.020       (  0.251)       0.018        0.002
274  22.83     0.07      0.020       (  0.250)       0.018        0.002
275  22.92     0.07      0.020       (  0.250)       0.018        0.002
276  23.00     0.07      0.020       (  0.249)       0.018        0.002
277  23.08     0.07      0.020       (  0.248)       0.018        0.002
278  23.17     0.07      0.020       (  0.248)       0.018        0.002
279  23.25     0.07      0.020       (  0.247)       0.018        0.002
280  23.33     0.07      0.020       (  0.247)       0.018        0.002
281  23.42     0.07      0.020       (  0.246)       0.018        0.002
282  23.50     0.07      0.020       (  0.246)       0.018        0.002
283  23.58     0.07      0.020       (  0.246)       0.018        0.002
284  23.67     0.07      0.020       (  0.245)       0.018        0.002
285  23.75     0.07      0.020       (  0.245)       0.018        0.002
286  23.83     0.07      0.020       (  0.245)       0.018        0.002
287  23.92     0.07      0.020       (  0.244)       0.018        0.002
288  24.00     0.07      0.020       (  0.244)       0.018        0.002
               (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     3.0
      Flood volume = Effective rainfall      0.25(In)
       times area       1.9(Ac.)/[(In)/(Ft.)] =       0.0(Ac.Ft)
      Total soil loss =      2.25(In)
      Total soil loss =     0.351(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =        1697.0 Cubic Feet
      Total soil loss =       15273.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.064(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0000      0.00  Q         |         |         |         |
   0+10       0.0000      0.00  Q         |         |         |         |
   0+15       0.0001      0.00  Q         |         |         |         |
   0+20       0.0001      0.00  Q         |         |         |         |
   0+25       0.0001      0.01  Q         |         |         |         |
   0+30       0.0002      0.01  Q         |         |         |         |
   0+35       0.0002      0.01  Q         |         |         |         |
   0+40       0.0002      0.01  Q         |         |         |         |
   0+45       0.0003      0.01  Q         |         |         |         |
   0+50       0.0003      0.01  Q         |         |         |         |
   0+55       0.0004      0.01  Q         |         |         |         |
   1+ 0       0.0004      0.01  Q         |         |         |         |
   1+ 5       0.0005      0.01  Q         |         |         |         |
```

1+10	0.0005	0.01	Q				
1+15	0.0006	0.01	Q				
1+20	0.0006	0.01	Q				
1+25	0.0006	0.01	Q				
1+30	0.0007	0.01	Q				
1+35	0.0007	0.01	Q				
1+40	0.0008	0.01	Q				
1+45	0.0008	0.01	Q				
1+50	0.0008	0.01	Q				
1+55	0.0009	0.01	Q				
2+ 0	0.0009	0.01	Q				
2+ 5	0.0010	0.01	QV				
2+10	0.0010	0.01	QV				
2+15	0.0011	0.01	QV				
2+20	0.0011	0.01	QV				
2+25	0.0012	0.01	QV				
2+30	0.0012	0.01	QV				
2+35	0.0013	0.01	QV				
2+40	0.0014	0.01	QV				
2+45	0.0014	0.01	QV				
2+50	0.0015	0.01	QV				
2+55	0.0016	0.01	QV				
3+ 0	0.0016	0.01	QV				
3+ 5	0.0017	0.01	QV				
3+10	0.0018	0.01	QV				
3+15	0.0018	0.01	QV				
3+20	0.0019	0.01	QV				
3+25	0.0020	0.01	Q V				
3+30	0.0020	0.01	Q V				
3+35	0.0021	0.01	Q V				
3+40	0.0021	0.01	Q V				
3+45	0.0022	0.01	Q V				
3+50	0.0023	0.01	Q V				
3+55	0.0024	0.01	Q V				
4+ 0	0.0024	0.01	Q V				
4+ 5	0.0025	0.01	Q V				
4+10	0.0026	0.01	Q V				
4+15	0.0027	0.01	Q V				
4+20	0.0028	0.01	Q V				
4+25	0.0028	0.01	Q V				
4+30	0.0029	0.01	Q V				
4+35	0.0030	0.01	Q V				
4+40	0.0031	0.01	Q V				
4+45	0.0032	0.01	Q V				
4+50	0.0033	0.01	Q V				
4+55	0.0034	0.01	Q V				
5+ 0	0.0035	0.02	Q V				
5+ 5	0.0036	0.01	Q V				
5+10	0.0037	0.01	Q V				
5+15	0.0038	0.01	Q V				
5+20	0.0038	0.01	Q V				
5+25	0.0039	0.01	Q V				
5+30	0.0040	0.01	Q V				
5+35	0.0041	0.01	Q V				
5+40	0.0042	0.01	Q V				
5+45	0.0043	0.02	Q V				
5+50	0.0044	0.02	Q V				
5+55	0.0045	0.02	Q V				
6+ 0	0.0046	0.02	Q V				
6+ 5	0.0047	0.02	Q V				
6+10	0.0049	0.02	Q V				
6+15	0.0050	0.02	Q V				
6+20	0.0051	0.02	Q V				
6+25	0.0052	0.02	Q V				
6+30	0.0053	0.02	Q V				
6+35	0.0055	0.02	Q V				
6+40	0.0056	0.02	Q V				
6+45	0.0057	0.02	Q V				
6+50	0.0058	0.02	Q V				
6+55	0.0060	0.02	Q V				
7+ 0	0.0061	0.02	Q V				

7+ 5	0.0062	0.02	Q	V	|	|	|	|
7+10	0.0064	0.02	Q	V	|	|	|	|
7+15	0.0065	0.02	Q	V	|	|	|	|
7+20	0.0066	0.02	Q	V	|	|	|	|
7+25	0.0068	0.02	Q	V	|	|	|	|
7+30	0.0069	0.02	Q	V	|	|	|	|
7+35	0.0071	0.02	Q	V	|	|	|	|
7+40	0.0072	0.02	Q	V	|	|	|	|
7+45	0.0074	0.02	Q	V	|	|	|	|
7+50	0.0075	0.02	Q	V	|	|	|	|
7+55	0.0077	0.02	Q	V	|	|	|	|
8+ 0	0.0079	0.02	Q	V	|	|	|	|
8+ 5	0.0080	0.03	Q	V	|	|	|	|
8+10	0.0082	0.03	Q	V	|	|	|	|
8+15	0.0084	0.03	Q	V	|	|	|	|
8+20	0.0086	0.03	Q	V	|	|	|	|
8+25	0.0088	0.03	Q	V	|	|	|	|
8+30	0.0090	0.03	Q	V	|	|	|	|
8+35	0.0092	0.03	Q	V	|	|	|	|
8+40	0.0094	0.03	Q	V	|	|	|	|
8+45	0.0096	0.03	Q	V	|	|	|	|
8+50	0.0098	0.03	Q	V	|	|	|	|
8+55	0.0101	0.03	Q	V	|	|	|	|
9+ 0	0.0103	0.03	Q	V	|	|	|	|
9+ 5	0.0105	0.03	Q	V	|	|	|	|
9+10	0.0108	0.04	Q	V	|	|	|	|
9+15	0.0110	0.04	Q	V	|	|	|	|
9+20	0.0113	0.04	Q	V	|	|	|	|
9+25	0.0115	0.04	Q	V	|	|	|	|
9+30	0.0118	0.04	Q	V	|	|	|	|
9+35	0.0120	0.04	Q	V	|	|	|	|
9+40	0.0123	0.04	Q	V	|	|	|	|
9+45	0.0126	0.04	Q	V	|	|	|	|
9+50	0.0129	0.04	Q	V	|	|	|	|
9+55	0.0131	0.04	Q	V	|	|	|	|
10+ 0	0.0134	0.04	Q	V	|	|	|	|
10+ 5	0.0137	0.04	Q	V	|	|	|	|
10+10	0.0139	0.03	Q	V	|	|	|	|
10+15	0.0141	0.03	Q	V	|	|	|	|
10+20	0.0143	0.03	Q	V	|	|	|	|
10+25	0.0145	0.03	Q	V	|	|	|	|
10+30	0.0147	0.03	Q	V	|	|	|	|
10+35	0.0149	0.03	Q	V	|	|	|	|
10+40	0.0151	0.04	Q	V	|	|	|	|
10+45	0.0154	0.04	Q	V	|	|	|	|
10+50	0.0157	0.04	Q	V	|	|	|	|
10+55	0.0159	0.04	Q	V	|	|	|	|
11+ 0	0.0162	0.04	Q	V	|	|	|	|
11+ 5	0.0164	0.04	Q	V	|	|	|	|
11+10	0.0167	0.04	Q	V	|	|	|	|
11+15	0.0169	0.04	Q	V	|	|	|	|
11+20	0.0172	0.04	Q	V	|	|	|	|
11+25	0.0174	0.04	Q	V	|	|	|	|
11+30	0.0177	0.04	Q	V	|	|	|	|
11+35	0.0179	0.03	Q	V	|	|	|	|
11+40	0.0181	0.03	Q	V	|	|	|	|
11+45	0.0183	0.03	Q	V	|	|	|	|
11+50	0.0186	0.03	Q	V	|	|	|	|
11+55	0.0188	0.03	Q	V	|	|	|	|
12+ 0	0.0190	0.03	Q	V	|	|	|	|
12+ 5	0.0193	0.04	Q	V	|	|	|	|
12+10	0.0196	0.05	Q	V	|	|	|	|
12+15	0.0199	0.05	Q	V	|	|	|	|
12+20	0.0203	0.05	Q	V	|	|	|	|
12+25	0.0206	0.05	Q	V	|	|	|	|
12+30	0.0209	0.05	Q	V	|	|	|	|
12+35	0.0213	0.05	Q	V	|	|	|	|
12+40	0.0217	0.05	Q	V	|	|	|	|
12+45	0.0220	0.05	Q	V	|	|	|	|
12+50	0.0224	0.05	Q	V	|	|	|	|
12+55	0.0228	0.05	Q	V	|	|	|	|

13+ 0	0.0231	0.05	Q			V		
13+ 5	0.0235	0.06	Q			V		
13+10	0.0240	0.06	Q			V		
13+15	0.0244	0.06	Q			V		
13+20	0.0249	0.06	Q			V		
13+25	0.0253	0.06	Q			V		
13+30	0.0257	0.06	Q			V		
13+35	0.0261	0.05	Q			V		
13+40	0.0264	0.05	Q			V		
13+45	0.0267	0.04	Q			V		
13+50	0.0270	0.04	Q			V		
13+55	0.0273	0.04	Q			V		
14+ 0	0.0276	0.04	Q			V		
14+ 5	0.0280	0.05	Q			V		
14+10	0.0283	0.05	Q			V		
14+15	0.0287	0.05	Q			V		
14+20	0.0290	0.05	Q			V		
14+25	0.0293	0.05	Q			V		
14+30	0.0297	0.05	Q			V		
14+35	0.0300	0.05	Q			V		
14+40	0.0304	0.05	Q			V		
14+45	0.0307	0.05	Q			V		
14+50	0.0310	0.05	Q			V		
14+55	0.0313	0.05	Q			V		
15+ 0	0.0317	0.05	Q			V		
15+ 5	0.0320	0.05	Q			V		
15+10	0.0323	0.05	Q			V		
15+15	0.0326	0.05	Q			V		
15+20	0.0329	0.04	Q			V		
15+25	0.0332	0.04	Q			V		
15+30	0.0335	0.04	Q			V		
15+35	0.0338	0.04	Q			V		
15+40	0.0341	0.04	Q			V		
15+45	0.0343	0.04	Q			V		
15+50	0.0345	0.04	Q			V		
15+55	0.0348	0.04	Q			V		
16+ 0	0.0350	0.04	Q			V		
16+ 5	0.0352	0.02	Q			V		
16+10	0.0353	0.01	Q			V		
16+15	0.0353	0.01	Q			V		
16+20	0.0354	0.01	Q			V		
16+25	0.0354	0.01	Q			V		
16+30	0.0355	0.01	Q			V		
16+35	0.0355	0.01	Q			V		
16+40	0.0356	0.01	Q			V		
16+45	0.0356	0.01	Q			V		
16+50	0.0357	0.01	Q			V		
16+55	0.0357	0.01	Q			V		
17+ 0	0.0357	0.01	Q			V		
17+ 5	0.0358	0.01	Q			V		
17+10	0.0358	0.01	Q			V		
17+15	0.0359	0.01	Q			V		
17+20	0.0360	0.01	Q			V		
17+25	0.0360	0.01	Q			V		
17+30	0.0361	0.01	Q			V		
17+35	0.0362	0.01	Q			V		
17+40	0.0362	0.01	Q			V		
17+45	0.0363	0.01	Q			V		
17+50	0.0364	0.01	Q			V		
17+55	0.0364	0.01	Q			V		
18+ 0	0.0365	0.01	Q			V		
18+ 5	0.0365	0.01	Q			V		
18+10	0.0366	0.01	Q			V		
18+15	0.0366	0.01	Q			V		
18+20	0.0367	0.01	Q			V		
18+25	0.0367	0.01	Q			V		
18+30	0.0368	0.01	Q			V		
18+35	0.0368	0.01	Q			V		
18+40	0.0369	0.01	Q			V		
18+45	0.0369	0.01	Q			V		
18+50	0.0369	0.00	Q			V		

```
  18+55       0.0370      0.00  Q          |          |          |      V  |
  19+ 0       0.0370      0.00  Q          |          |          |      V  |
  19+ 5       0.0370      0.00  Q          |          |          |       V |
  19+10       0.0371      0.01  Q          |          |          |       V |
  19+15       0.0371      0.01  Q          |          |          |       V |
  19+20       0.0371      0.01  Q          |          |          |       V |
  19+25       0.0372      0.01  Q          |          |          |       V |
  19+30       0.0372      0.01  Q          |          |          |       V |
  19+35       0.0373      0.01  Q          |          |          |       V |
  19+40       0.0373      0.01  Q          |          |          |       V |
  19+45       0.0374      0.01  Q          |          |          |       V |
  19+50       0.0374      0.00  Q          |          |          |       V |
  19+55       0.0374      0.00  Q          |          |          |       V |
  20+ 0       0.0375      0.00  Q          |          |          |       V |
  20+ 5       0.0375      0.00  Q          |          |          |       V |
  20+10       0.0375      0.01  Q          |          |          |       V |
  20+15       0.0376      0.01  Q          |          |          |       V |
  20+20       0.0376      0.01  Q          |          |          |       V |
  20+25       0.0376      0.01  Q          |          |          |       V |
  20+30       0.0377      0.01  Q          |          |          |       V |
  20+35       0.0377      0.01  Q          |          |          |       V |
  20+40       0.0378      0.01  Q          |          |          |       V |
  20+45       0.0378      0.01  Q          |          |          |       V |
  20+50       0.0378      0.00  Q          |          |          |       V |
  20+55       0.0379      0.00  Q          |          |          |       V |
  21+ 0       0.0379      0.00  Q          |          |          |       V |
  21+ 5       0.0379      0.00  Q          |          |          |       V |
  21+10       0.0380      0.01  Q          |          |          |       V |
  21+15       0.0380      0.01  Q          |          |          |        V|
  21+20       0.0380      0.00  Q          |          |          |        V|
  21+25       0.0381      0.00  Q          |          |          |        V|
  21+30       0.0381      0.00  Q          |          |          |        V|
  21+35       0.0381      0.00  Q          |          |          |        V|
  21+40       0.0382      0.01  Q          |          |          |        V|
  21+45       0.0382      0.01  Q          |          |          |        V|
  21+50       0.0382      0.00  Q          |          |          |        V|
  21+55       0.0383      0.00  Q          |          |          |        V|
  22+ 0       0.0383      0.00  Q          |          |          |        V|
  22+ 5       0.0383      0.00  Q          |          |          |        V|
  22+10       0.0383      0.01  Q          |          |          |        V|
  22+15       0.0384      0.01  Q          |          |          |        V|
  22+20       0.0384      0.00  Q          |          |          |        V|
  22+25       0.0384      0.00  Q          |          |          |        V|
  22+30       0.0385      0.00  Q          |          |          |        V|
  22+35       0.0385      0.00  Q          |          |          |        V|
  22+40       0.0385      0.00  Q          |          |          |        V|
  22+45       0.0385      0.00  Q          |          |          |        V|
  22+50       0.0386      0.00  Q          |          |          |        V|
  22+55       0.0386      0.00  Q          |          |          |        V|
  23+ 0       0.0386      0.00  Q          |          |          |        V|
  23+ 5       0.0387      0.00  Q          |          |          |        V|
  23+10       0.0387      0.00  Q          |          |          |        V|
  23+15       0.0387      0.00  Q          |          |          |        V|
  23+20       0.0387      0.00  Q          |          |          |        V|
  23+25       0.0388      0.00  Q          |          |          |        V|
  23+30       0.0388      0.00  Q          |          |          |        V|
  23+35       0.0388      0.00  Q          |          |          |        V|
  23+40       0.0388      0.00  Q          |          |          |        V|
  23+45       0.0389      0.00  Q          |          |          |        V|
  23+50       0.0389      0.00  Q          |          |          |        V|
  23+55       0.0389      0.00  Q          |          |          |        V|
  24+ 0       0.0389      0.00  Q          |          |          |        V|
  24+ 5       0.0390      0.00  Q          |          |          |        V|
  24+10       0.0390      0.00  Q          |          |          |        V|
  24+15       0.0390      0.00  Q          |          |          |         V
-------------------------------------------------------------------------
```

APPENDIX D: POST-PROJECT CONDITION UNIT HYDROGRAPH HYDROLOGY CALCULATIONS

APPENDIX D.1: AREA "A" – 2-YEAR, 24-HOUR STORM EVENT

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 03/26/21 File: ARAP242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6279

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
UNIT HYDROGRAPH ANALYSIS, 2-YEAR STORM EVENT
FILENAME: ARAP

Drainage Area = 2.17(Ac.) = 0.003 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 2.17(Ac.) = 0.003 Sq. Mi.
Length along longest watercourse = 574.00(Ft.)
Length along longest watercourse measured to centroid = 326.00(Ft.)
Length along longest watercourse = 0.109 Mi.
Length along longest watercourse measured to centroid = 0.062 Mi.
Difference in elevation = 13.00(Ft.)
Slope along watercourse = 119.5819 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.022 Hr.
Lag time = 1.30 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.52 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.17	2.50	5.42

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.17	6.50	14.11

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.170	60.48	0.900

Total Area Entered = 2.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
60.5	40.5	0.665	0.900	0.126	1.000	0.126
					Sum (F) =	0.126

Area averaged mean soil loss (F) (In/Hr) = 0.126
Minimum soil loss rate ((In/Hr)) = 0.063
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	384.650	63.996	1.400
2	0.167	769.299	32.871	0.719
3	0.250	1153.949	3.133	0.069
			Sum = 100.000 Sum=	2.187

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.224)	0.004	0.016
2	0.17	0.07	0.020	(0.223)	0.004	0.016
3	0.25	0.07	0.020	(0.222)	0.004	0.016
4	0.33	0.10	0.030	(0.221)	0.005	0.025
5	0.42	0.10	0.030	(0.221)	0.005	0.025
6	0.50	0.10	0.030	(0.220)	0.005	0.025
7	0.58	0.10	0.030	(0.219)	0.005	0.025
8	0.67	0.10	0.030	(0.218)	0.005	0.025
9	0.75	0.10	0.030	(0.217)	0.005	0.025
10	0.83	0.13	0.040	(0.216)	0.007	0.033
11	0.92	0.13	0.040	(0.215)	0.007	0.033
12	1.00	0.13	0.040	(0.215)	0.007	0.033
13	1.08	0.10	0.030	(0.214)	0.005	0.025
14	1.17	0.10	0.030	(0.213)	0.005	0.025
15	1.25	0.10	0.030	(0.212)	0.005	0.025
16	1.33	0.10	0.030	(0.211)	0.005	0.025
17	1.42	0.10	0.030	(0.210)	0.005	0.025
18	1.50	0.10	0.030	(0.210)	0.005	0.025
19	1.58	0.10	0.030	(0.209)	0.005	0.025
20	1.67	0.10	0.030	(0.208)	0.005	0.025
21	1.75	0.10	0.030	(0.207)	0.005	0.025
22	1.83	0.13	0.040	(0.206)	0.007	0.033
23	1.92	0.13	0.040	(0.205)	0.007	0.033
24	2.00	0.13	0.040	(0.205)	0.007	0.033
25	2.08	0.13	0.040	(0.204)	0.007	0.033
26	2.17	0.13	0.040	(0.203)	0.007	0.033
27	2.25	0.13	0.040	(0.202)	0.007	0.033
28	2.33	0.13	0.040	(0.201)	0.007	0.033
29	2.42	0.13	0.040	(0.200)	0.007	0.033
30	2.50	0.13	0.040	(0.200)	0.007	0.033
31	2.58	0.17	0.050	(0.199)	0.009	0.041
32	2.67	0.17	0.050	(0.198)	0.009	0.041
33	2.75	0.17	0.050	(0.197)	0.009	0.041
34	2.83	0.17	0.050	(0.196)	0.009	0.041
35	2.92	0.17	0.050	(0.196)	0.009	0.041
36	3.00	0.17	0.050	(0.195)	0.009	0.041
37	3.08	0.17	0.050	(0.194)	0.009	0.041
38	3.17	0.17	0.050	(0.193)	0.009	0.041
39	3.25	0.17	0.050	(0.192)	0.009	0.041

40	3.33	0.17	0.050	(0.192)	0.009	0.041
41	3.42	0.17	0.050	(0.191)	0.009	0.041
42	3.50	0.17	0.050	(0.190)	0.009	0.041
43	3.58	0.17	0.050	(0.189)	0.009	0.041
44	3.67	0.17	0.050	(0.188)	0.009	0.041
45	3.75	0.17	0.050	(0.188)	0.009	0.041
46	3.83	0.20	0.060	(0.187)	0.011	0.049
47	3.92	0.20	0.060	(0.186)	0.011	0.049
48	4.00	0.20	0.060	(0.185)	0.011	0.049
49	4.08	0.20	0.060	(0.184)	0.011	0.049
50	4.17	0.20	0.060	(0.184)	0.011	0.049
51	4.25	0.20	0.060	(0.183)	0.011	0.049
52	4.33	0.23	0.070	(0.182)	0.013	0.057
53	4.42	0.23	0.070	(0.181)	0.013	0.057
54	4.50	0.23	0.070	(0.181)	0.013	0.057
55	4.58	0.23	0.070	(0.180)	0.013	0.057
56	4.67	0.23	0.070	(0.179)	0.013	0.057
57	4.75	0.23	0.070	(0.178)	0.013	0.057
58	4.83	0.27	0.080	(0.177)	0.014	0.066
59	4.92	0.27	0.080	(0.177)	0.014	0.066
60	5.00	0.27	0.080	(0.176)	0.014	0.066
61	5.08	0.20	0.060	(0.175)	0.011	0.049
62	5.17	0.20	0.060	(0.174)	0.011	0.049
63	5.25	0.20	0.060	(0.174)	0.011	0.049
64	5.33	0.23	0.070	(0.173)	0.013	0.057
65	5.42	0.23	0.070	(0.172)	0.013	0.057
66	5.50	0.23	0.070	(0.171)	0.013	0.057
67	5.58	0.27	0.080	(0.171)	0.014	0.066
68	5.67	0.27	0.080	(0.170)	0.014	0.066
69	5.75	0.27	0.080	(0.169)	0.014	0.066
70	5.83	0.27	0.080	(0.168)	0.014	0.066
71	5.92	0.27	0.080	(0.168)	0.014	0.066
72	6.00	0.27	0.080	(0.167)	0.014	0.066
73	6.08	0.30	0.090	(0.166)	0.016	0.074
74	6.17	0.30	0.090	(0.165)	0.016	0.074
75	6.25	0.30	0.090	(0.165)	0.016	0.074
76	6.33	0.30	0.090	(0.164)	0.016	0.074
77	6.42	0.30	0.090	(0.163)	0.016	0.074
78	6.50	0.30	0.090	(0.162)	0.016	0.074
79	6.58	0.33	0.100	(0.162)	0.018	0.082
80	6.67	0.33	0.100	(0.161)	0.018	0.082
81	6.75	0.33	0.100	(0.160)	0.018	0.082
82	6.83	0.33	0.100	(0.160)	0.018	0.082
83	6.92	0.33	0.100	(0.159)	0.018	0.082
84	7.00	0.33	0.100	(0.158)	0.018	0.082
85	7.08	0.33	0.100	(0.157)	0.018	0.082
86	7.17	0.33	0.100	(0.157)	0.018	0.082
87	7.25	0.33	0.100	(0.156)	0.018	0.082
88	7.33	0.37	0.110	(0.155)	0.020	0.090
89	7.42	0.37	0.110	(0.155)	0.020	0.090
90	7.50	0.37	0.110	(0.154)	0.020	0.090
91	7.58	0.40	0.120	(0.153)	0.022	0.098
92	7.67	0.40	0.120	(0.152)	0.022	0.098
93	7.75	0.40	0.120	(0.152)	0.022	0.098
94	7.83	0.43	0.130	(0.151)	0.023	0.107
95	7.92	0.43	0.130	(0.150)	0.023	0.107
96	8.00	0.43	0.130	(0.150)	0.023	0.107
97	8.08	0.50	0.150	(0.149)	0.027	0.123
98	8.17	0.50	0.150	(0.148)	0.027	0.123
99	8.25	0.50	0.150	(0.148)	0.027	0.123
100	8.33	0.50	0.150	(0.147)	0.027	0.123
101	8.42	0.50	0.150	(0.146)	0.027	0.123
102	8.50	0.50	0.150	(0.145)	0.027	0.123
103	8.58	0.53	0.160	(0.145)	0.029	0.131
104	8.67	0.53	0.160	(0.144)	0.029	0.131
105	8.75	0.53	0.160	(0.143)	0.029	0.131
106	8.83	0.57	0.170	(0.143)	0.031	0.139
107	8.92	0.57	0.170	(0.142)	0.031	0.139
108	9.00	0.57	0.170	(0.141)	0.031	0.139
109	9.08	0.63	0.190	(0.141)	0.034	0.156
110	9.17	0.63	0.190	(0.140)	0.034	0.156

111	9.25	0.63	0.190	(0.139)	0.034	0.156
112	9.33	0.67	0.200	(0.139)	0.036	0.164
113	9.42	0.67	0.200	(0.138)	0.036	0.164
114	9.50	0.67	0.200	(0.137)	0.036	0.164
115	9.58	0.70	0.210	(0.137)	0.038	0.172
116	9.67	0.70	0.210	(0.136)	0.038	0.172
117	9.75	0.70	0.210	(0.135)	0.038	0.172
118	9.83	0.73	0.220	(0.135)	0.040	0.180
119	9.92	0.73	0.220	(0.134)	0.040	0.180
120	10.00	0.73	0.220	(0.133)	0.040	0.180
121	10.08	0.50	0.150	(0.133)	0.027	0.123
122	10.17	0.50	0.150	(0.132)	0.027	0.123
123	10.25	0.50	0.150	(0.132)	0.027	0.123
124	10.33	0.50	0.150	(0.131)	0.027	0.123
125	10.42	0.50	0.150	(0.130)	0.027	0.123
126	10.50	0.50	0.150	(0.130)	0.027	0.123
127	10.58	0.67	0.200	(0.129)	0.036	0.164
128	10.67	0.67	0.200	(0.128)	0.036	0.164
129	10.75	0.67	0.200	(0.128)	0.036	0.164
130	10.83	0.67	0.200	(0.127)	0.036	0.164
131	10.92	0.67	0.200	(0.127)	0.036	0.164
132	11.00	0.67	0.200	(0.126)	0.036	0.164
133	11.08	0.63	0.190	(0.125)	0.034	0.156
134	11.17	0.63	0.190	(0.125)	0.034	0.156
135	11.25	0.63	0.190	(0.124)	0.034	0.156
136	11.33	0.63	0.190	(0.123)	0.034	0.156
137	11.42	0.63	0.190	(0.123)	0.034	0.156
138	11.50	0.63	0.190	(0.122)	0.034	0.156
139	11.58	0.57	0.170	(0.122)	0.031	0.139
140	11.67	0.57	0.170	(0.121)	0.031	0.139
141	11.75	0.57	0.170	(0.120)	0.031	0.139
142	11.83	0.60	0.180	(0.120)	0.032	0.148
143	11.92	0.60	0.180	(0.119)	0.032	0.148
144	12.00	0.60	0.180	(0.119)	0.032	0.148
145	12.08	0.83	0.250	(0.118)	0.045	0.205
146	12.17	0.83	0.250	(0.117)	0.045	0.205
147	12.25	0.83	0.250	(0.117)	0.045	0.205
148	12.33	0.87	0.260	(0.116)	0.047	0.213
149	12.42	0.87	0.260	(0.116)	0.047	0.213
150	12.50	0.87	0.260	(0.115)	0.047	0.213
151	12.58	0.93	0.280	(0.114)	0.050	0.230
152	12.67	0.93	0.280	(0.114)	0.050	0.230
153	12.75	0.93	0.280	(0.113)	0.050	0.230
154	12.83	0.97	0.290	(0.113)	0.052	0.238
155	12.92	0.97	0.290	(0.112)	0.052	0.238
156	13.00	0.97	0.290	(0.112)	0.052	0.238
157	13.08	1.13	0.340	(0.111)	0.061	0.279
158	13.17	1.13	0.340	(0.110)	0.061	0.279
159	13.25	1.13	0.340	(0.110)	0.061	0.279
160	13.33	1.13	0.340	(0.109)	0.061	0.279
161	13.42	1.13	0.340	(0.109)	0.061	0.279
162	13.50	1.13	0.340	(0.108)	0.061	0.279
163	13.58	0.77	0.230	(0.108)	0.041	0.189
164	13.67	0.77	0.230	(0.107)	0.041	0.189
165	13.75	0.77	0.230	(0.107)	0.041	0.189
166	13.83	0.77	0.230	(0.106)	0.041	0.189
167	13.92	0.77	0.230	(0.106)	0.041	0.189
168	14.00	0.77	0.230	(0.105)	0.041	0.189
169	14.08	0.90	0.270	(0.104)	0.049	0.221
170	14.17	0.90	0.270	(0.104)	0.049	0.221
171	14.25	0.90	0.270	(0.103)	0.049	0.221
172	14.33	0.87	0.260	(0.103)	0.047	0.213
173	14.42	0.87	0.260	(0.102)	0.047	0.213
174	14.50	0.87	0.260	(0.102)	0.047	0.213
175	14.58	0.87	0.260	(0.101)	0.047	0.213
176	14.67	0.87	0.260	(0.101)	0.047	0.213
177	14.75	0.87	0.260	(0.100)	0.047	0.213
178	14.83	0.83	0.250	(0.100)	0.045	0.205
179	14.92	0.83	0.250	(0.099)	0.045	0.205
180	15.00	0.83	0.250	(0.099)	0.045	0.205
181	15.08	0.80	0.240	(0.098)	0.043	0.197

182	15.17	0.80	0.240	(0.098)	0.043	0.197
183	15.25	0.80	0.240	(0.097)	0.043	0.197
184	15.33	0.77	0.230	(0.097)	0.041	0.189
185	15.42	0.77	0.230	(0.096)	0.041	0.189
186	15.50	0.77	0.230	(0.096)	0.041	0.189
187	15.58	0.63	0.190	(0.095)	0.034	0.156
188	15.67	0.63	0.190	(0.095)	0.034	0.156
189	15.75	0.63	0.190	(0.094)	0.034	0.156
190	15.83	0.63	0.190	(0.094)	0.034	0.156
191	15.92	0.63	0.190	(0.093)	0.034	0.156
192	16.00	0.63	0.190	(0.093)	0.034	0.156
193	16.08	0.13	0.040	(0.092)	0.007	0.033
194	16.17	0.13	0.040	(0.092)	0.007	0.033
195	16.25	0.13	0.040	(0.091)	0.007	0.033
196	16.33	0.13	0.040	(0.091)	0.007	0.033
197	16.42	0.13	0.040	(0.090)	0.007	0.033
198	16.50	0.13	0.040	(0.090)	0.007	0.033
199	16.58	0.10	0.030	(0.090)	0.005	0.025
200	16.67	0.10	0.030	(0.089)	0.005	0.025
201	16.75	0.10	0.030	(0.089)	0.005	0.025
202	16.83	0.10	0.030	(0.088)	0.005	0.025
203	16.92	0.10	0.030	(0.088)	0.005	0.025
204	17.00	0.10	0.030	(0.087)	0.005	0.025
205	17.08	0.17	0.050	(0.087)	0.009	0.041
206	17.17	0.17	0.050	(0.086)	0.009	0.041
207	17.25	0.17	0.050	(0.086)	0.009	0.041
208	17.33	0.17	0.050	(0.086)	0.009	0.041
209	17.42	0.17	0.050	(0.085)	0.009	0.041
210	17.50	0.17	0.050	(0.085)	0.009	0.041
211	17.58	0.17	0.050	(0.084)	0.009	0.041
212	17.67	0.17	0.050	(0.084)	0.009	0.041
213	17.75	0.17	0.050	(0.083)	0.009	0.041
214	17.83	0.13	0.040	(0.083)	0.007	0.033
215	17.92	0.13	0.040	(0.083)	0.007	0.033
216	18.00	0.13	0.040	(0.082)	0.007	0.033
217	18.08	0.13	0.040	(0.082)	0.007	0.033
218	18.17	0.13	0.040	(0.081)	0.007	0.033
219	18.25	0.13	0.040	(0.081)	0.007	0.033
220	18.33	0.13	0.040	(0.081)	0.007	0.033
221	18.42	0.13	0.040	(0.080)	0.007	0.033
222	18.50	0.13	0.040	(0.080)	0.007	0.033
223	18.58	0.10	0.030	(0.079)	0.005	0.025
224	18.67	0.10	0.030	(0.079)	0.005	0.025
225	18.75	0.10	0.030	(0.079)	0.005	0.025
226	18.83	0.07	0.020	(0.078)	0.004	0.016
227	18.92	0.07	0.020	(0.078)	0.004	0.016
228	19.00	0.07	0.020	(0.078)	0.004	0.016
229	19.08	0.10	0.030	(0.077)	0.005	0.025
230	19.17	0.10	0.030	(0.077)	0.005	0.025
231	19.25	0.10	0.030	(0.076)	0.005	0.025
232	19.33	0.13	0.040	(0.076)	0.007	0.033
233	19.42	0.13	0.040	(0.076)	0.007	0.033
234	19.50	0.13	0.040	(0.075)	0.007	0.033
235	19.58	0.10	0.030	(0.075)	0.005	0.025
236	19.67	0.10	0.030	(0.075)	0.005	0.025
237	19.75	0.10	0.030	(0.074)	0.005	0.025
238	19.83	0.07	0.020	(0.074)	0.004	0.016
239	19.92	0.07	0.020	(0.074)	0.004	0.016
240	20.00	0.07	0.020	(0.073)	0.004	0.016
241	20.08	0.10	0.030	(0.073)	0.005	0.025
242	20.17	0.10	0.030	(0.073)	0.005	0.025
243	20.25	0.10	0.030	(0.072)	0.005	0.025
244	20.33	0.10	0.030	(0.072)	0.005	0.025
245	20.42	0.10	0.030	(0.072)	0.005	0.025
246	20.50	0.10	0.030	(0.072)	0.005	0.025
247	20.58	0.10	0.030	(0.071)	0.005	0.025
248	20.67	0.10	0.030	(0.071)	0.005	0.025
249	20.75	0.10	0.030	(0.071)	0.005	0.025
250	20.83	0.07	0.020	(0.070)	0.004	0.016
251	20.92	0.07	0.020	(0.070)	0.004	0.016
252	21.00	0.07	0.020	(0.070)	0.004	0.016

```
253  21.08     0.10      0.030       (  0.069)       0.005        0.025
254  21.17     0.10      0.030       (  0.069)       0.005        0.025
255  21.25     0.10      0.030       (  0.069)       0.005        0.025
256  21.33     0.07      0.020       (  0.069)       0.004        0.016
257  21.42     0.07      0.020       (  0.068)       0.004        0.016
258  21.50     0.07      0.020       (  0.068)       0.004        0.016
259  21.58     0.10      0.030       (  0.068)       0.005        0.025
260  21.67     0.10      0.030       (  0.068)       0.005        0.025
261  21.75     0.10      0.030       (  0.067)       0.005        0.025
262  21.83     0.07      0.020       (  0.067)       0.004        0.016
263  21.92     0.07      0.020       (  0.067)       0.004        0.016
264  22.00     0.07      0.020       (  0.067)       0.004        0.016
265  22.08     0.10      0.030       (  0.067)       0.005        0.025
266  22.17     0.10      0.030       (  0.066)       0.005        0.025
267  22.25     0.10      0.030       (  0.066)       0.005        0.025
268  22.33     0.07      0.020       (  0.066)       0.004        0.016
269  22.42     0.07      0.020       (  0.066)       0.004        0.016
270  22.50     0.07      0.020       (  0.065)       0.004        0.016
271  22.58     0.07      0.020       (  0.065)       0.004        0.016
272  22.67     0.07      0.020       (  0.065)       0.004        0.016
273  22.75     0.07      0.020       (  0.065)       0.004        0.016
274  22.83     0.07      0.020       (  0.065)       0.004        0.016
275  22.92     0.07      0.020       (  0.065)       0.004        0.016
276  23.00     0.07      0.020       (  0.064)       0.004        0.016
277  23.08     0.07      0.020       (  0.064)       0.004        0.016
278  23.17     0.07      0.020       (  0.064)       0.004        0.016
279  23.25     0.07      0.020       (  0.064)       0.004        0.016
280  23.33     0.07      0.020       (  0.064)       0.004        0.016
281  23.42     0.07      0.020       (  0.064)       0.004        0.016
282  23.50     0.07      0.020       (  0.064)       0.004        0.016
283  23.58     0.07      0.020       (  0.064)       0.004        0.016
284  23.67     0.07      0.020       (  0.063)       0.004        0.016
285  23.75     0.07      0.020       (  0.063)       0.004        0.016
286  23.83     0.07      0.020       (  0.063)       0.004        0.016
287  23.92     0.07      0.020       (  0.063)       0.004        0.016
288  24.00     0.07      0.020       (  0.063)       0.004        0.016
               (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    24.6
      Flood volume = Effective rainfall      2.05(In)
       times area       2.2(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
      Total soil loss =      0.45(In)
      Total soil loss =     0.081(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =       16148.0 Cubic Feet
      Total soil loss =        3544.7 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.610(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0002      0.02  Q         |         |         |         |
   0+10       0.0004      0.03  Q         |         |         |         |
   0+15       0.0006      0.04  Q         |         |         |         |
   0+20       0.0010      0.05  Q         |         |         |         |
   0+25       0.0013      0.05  Q         |         |         |         |
   0+30       0.0017      0.05  Q         |         |         |         |
   0+35       0.0021      0.05  Q         |         |         |         |
   0+40       0.0024      0.05  Q         |         |         |         |
   0+45       0.0028      0.05  Q         |         |         |         |
   0+50       0.0033      0.07  Q         |         |         |         |
   0+55       0.0038      0.07  Q         |         |         |         |
   1+ 0       0.0043      0.07  Q         |         |         |         |
   1+ 5       0.0047      0.06  Q         |         |         |         |
   1+10       0.0050      0.05  Q         |         |         |         |
```

1+15	0.0054	0.05	Q				
1+20	0.0058	0.05	Q				
1+25	0.0062	0.05	Q				
1+30	0.0065	0.05	Q				
1+35	0.0069	0.05	Q				
1+40	0.0073	0.05	Q				
1+45	0.0076	0.05	Q				
1+50	0.0081	0.07	Q				
1+55	0.0086	0.07	Q				
2+ 0	0.0091	0.07	Q				
2+ 5	0.0096	0.07	QV				
2+10	0.0101	0.07	QV				
2+15	0.0106	0.07	QV				
2+20	0.0111	0.07	QV				
2+25	0.0115	0.07	QV				
2+30	0.0120	0.07	QV				
2+35	0.0126	0.08	QV				
2+40	0.0132	0.09	QV				
2+45	0.0138	0.09	QV				
2+50	0.0145	0.09	QV				
2+55	0.0151	0.09	QV				
3+ 0	0.0157	0.09	QV				
3+ 5	0.0163	0.09	QV				
3+10	0.0169	0.09	QV				
3+15	0.0176	0.09	QV				
3+20	0.0182	0.09	QV				
3+25	0.0188	0.09	Q V				
3+30	0.0194	0.09	Q V				
3+35	0.0200	0.09	Q V				
3+40	0.0206	0.09	Q V				
3+45	0.0213	0.09	Q V				
3+50	0.0220	0.10	Q V				
3+55	0.0227	0.11	Q V				
4+ 0	0.0234	0.11	Q V				
4+ 5	0.0242	0.11	Q V				
4+10	0.0249	0.11	Q V				
4+15	0.0257	0.11	Q V				
4+20	0.0265	0.12	Q V				
4+25	0.0273	0.13	Q V				
4+30	0.0282	0.13	Q V				
4+35	0.0291	0.13	Q V				
4+40	0.0299	0.13	Q V				
4+45	0.0308	0.13	Q V				
4+50	0.0317	0.14	Q V				
4+55	0.0327	0.14	Q V				
5+ 0	0.0337	0.14	Q V				
5+ 5	0.0345	0.12	Q V				
5+10	0.0353	0.11	Q V				
5+15	0.0360	0.11	Q V				
5+20	0.0369	0.12	Q V				
5+25	0.0377	0.13	Q V				
5+30	0.0386	0.13	Q V				
5+35	0.0395	0.14	Q V				
5+40	0.0405	0.14	Q V				
5+45	0.0415	0.14	Q V				
5+50	0.0425	0.14	Q V				
5+55	0.0435	0.14	Q V				
6+ 0	0.0445	0.14	Q V				
6+ 5	0.0455	0.16	Q V				
6+10	0.0466	0.16	Q V				
6+15	0.0478	0.16	Q V				
6+20	0.0489	0.16	Q V				
6+25	0.0500	0.16	Q V				
6+30	0.0511	0.16	Q V				
6+35	0.0523	0.17	Q V				
6+40	0.0535	0.18	Q V				
6+45	0.0548	0.18	Q V				
6+50	0.0560	0.18	Q V				
6+55	0.0572	0.18	Q V				
7+ 0	0.0585	0.18	Q V				
7+ 5	0.0597	0.18	Q V				

```
 7+10       0.0609      0.18  Q     V   |          |          |          |
 7+15       0.0622      0.18  Q     V   |          |          |          |
 7+20       0.0635      0.19  Q     V   |          |          |          |
 7+25       0.0648      0.20  Q     V   |          |          |          |
 7+30       0.0662      0.20  Q      V  |          |          |          |
 7+35       0.0676      0.21  Q      V  |          |          |          |
 7+40       0.0691      0.21  Q      V  |          |          |          |
 7+45       0.0706      0.22  Q      V  |          |          |          |
 7+50       0.0722      0.23  Q      V  |          |          |          |
 7+55       0.0738      0.23  Q      V  |          |          |          |
 8+ 0       0.0754      0.23  Q       V |          |          |          |
 8+ 5       0.0771      0.26  |Q      V |          |          |          |
 8+10       0.0790      0.27  |Q      V |          |          |          |
 8+15       0.0808      0.27  |Q      V |          |          |          |
 8+20       0.0827      0.27  |Q      V |          |          |          |
 8+25       0.0845      0.27  |Q       V|          |          |          |
 8+30       0.0864      0.27  |Q       V|          |          |          |
 8+35       0.0883      0.28  |Q       V|          |          |          |
 8+40       0.0903      0.29  |Q       V|          |          |          |
 8+45       0.0923      0.29  |Q       V|          |          |          |
 8+50       0.0943      0.30  |Q        V          |          |          |
 8+55       0.0964      0.30  |Q        V          |          |          |
 9+ 0       0.0985      0.31  |Q        V          |          |          |
 9+ 5       0.1008      0.33  |Q        V          |          |          |
 9+10       0.1031      0.34  |Q        |V         |          |          |
 9+15       0.1055      0.34  |Q        |V         |          |          |
 9+20       0.1079      0.35  |Q        |V         |          |          |
 9+25       0.1104      0.36  |Q        |V         |          |          |
 9+30       0.1128      0.36  |Q        | V        |          |          |
 9+35       0.1154      0.37  |Q        | V        |          |          |
 9+40       0.1180      0.38  |Q        | V        |          |          |
 9+45       0.1206      0.38  |Q        |  V       |          |          |
 9+50       0.1233      0.39  |Q        |  V       |          |          |
 9+55       0.1260      0.39  |Q        |  V       |          |          |
10+ 0       0.1287      0.39  |Q        |  V       |          |          |
10+ 5       0.1308      0.31  |Q        |   V      |          |          |
10+10       0.1327      0.27  |Q        |   V      |          |          |
10+15       0.1346      0.27  |Q        |   V      |          |          |
10+20       0.1364      0.27  |Q        |   V      |          |          |
10+25       0.1383      0.27  |Q        |   V      |          |          |
10+30       0.1401      0.27  |Q        |    V     |          |          |
10+35       0.1424      0.33  |Q        |    V     |          |          |
10+40       0.1448      0.36  |Q        |    V     |          |          |
10+45       0.1473      0.36  |Q        |    V     |          |          |
10+50       0.1498      0.36  |Q        |     V    |          |          |
10+55       0.1523      0.36  |Q        |     V    |          |          |
11+ 0       0.1547      0.36  |Q        |     V    |          |          |
11+ 5       0.1571      0.35  |Q        |     V    |          |          |
11+10       0.1595      0.34  |Q        |      V   |          |          |
11+15       0.1618      0.34  |Q        |      V   |          |          |
11+20       0.1642      0.34  |Q        |      V   |          |          |
11+25       0.1665      0.34  |Q        |      V   |          |          |
11+30       0.1689      0.34  |Q        |       V  |          |          |
11+35       0.1711      0.32  |Q        |       V  |          |          |
11+40       0.1732      0.31  |Q        |       V  |          |          |
11+45       0.1753      0.31  |Q        |       V  |          |          |
11+50       0.1774      0.32  |Q        |        V |          |          |
11+55       0.1797      0.32  |Q        |        V |          |          |
12+ 0       0.1819      0.32  |Q        |        V |          |          |
12+ 5       0.1847      0.40  |Q        |        V |          |          |
12+10       0.1877      0.44  |Q        |         V          |          |
12+15       0.1908      0.45  |Q        |         V          |          |
12+20       0.1940      0.46  |Q        |         V          |          |
12+25       0.1972      0.47  |Q        |         |V         |          |
12+30       0.2004      0.47  |Q        |         |V         |          |
12+35       0.2038      0.49  |Q        |         |V         |          |
12+40       0.2072      0.50  | Q       |         | V        |          |
12+45       0.2107      0.50  | Q       |         | V        |          |
12+50       0.2142      0.51  | Q       |         |  V       |          |
12+55       0.2178      0.52  | Q       |         |  V       |          |
13+ 0       0.2214      0.52  | Q       |         |  V       |          |
```

13+ 5	0.2254	0.58	Q		V		
13+10	0.2296	0.61	Q		V		
13+15	0.2338	0.61	Q		V		
13+20	0.2380	0.61	Q		V		
13+25	0.2422	0.61	Q		V		
13+30	0.2464	0.61	Q		V		
13+35	0.2497	0.48	Q		V		
13+40	0.2526	0.42	Q		V		
13+45	0.2554	0.41	Q		V		
13+50	0.2583	0.41	Q		V		
13+55	0.2611	0.41	Q		V		
14+ 0	0.2639	0.41	Q		V		
14+ 5	0.2671	0.46	Q		V		
14+10	0.2704	0.48	Q		V		
14+15	0.2738	0.48	Q		V		
14+20	0.2770	0.47	Q		V		
14+25	0.2802	0.47	Q		V		
14+30	0.2834	0.47	Q		V		
14+35	0.2867	0.47	Q		V		
14+40	0.2899	0.47	Q		V		
14+45	0.2931	0.47	Q		V		
14+50	0.2962	0.46	Q		V		
14+55	0.2993	0.45	Q		V		
15+ 0	0.3024	0.45	Q		V		
15+ 5	0.3054	0.44	Q		V		
15+10	0.3084	0.43	Q		V		
15+15	0.3113	0.43	Q		V		
15+20	0.3142	0.42	Q		V		
15+25	0.3171	0.41	Q		V		
15+30	0.3199	0.41	Q		V		
15+35	0.3224	0.37	Q		V		
15+40	0.3248	0.34	Q		V		
15+45	0.3272	0.34	Q		V		
15+50	0.3295	0.34	Q		V		
15+55	0.3319	0.34	Q		V		
16+ 0	0.3342	0.34	Q		V		
16+ 5	0.3354	0.17	Q		V		
16+10	0.3359	0.08	Q		V		
16+15	0.3364	0.07	Q		V		
16+20	0.3369	0.07	Q		V		
16+25	0.3374	0.07	Q		V		
16+30	0.3379	0.07	Q		V		
16+35	0.3383	0.06	Q		V		
16+40	0.3387	0.05	Q		V		
16+45	0.3391	0.05	Q		V		
16+50	0.3394	0.05	Q		V		
16+55	0.3398	0.05	Q		V		
17+ 0	0.3402	0.05	Q		V		
17+ 5	0.3407	0.08	Q		V		
17+10	0.3413	0.09	Q		V		
17+15	0.3419	0.09	Q		V		
17+20	0.3425	0.09	Q		V		
17+25	0.3432	0.09	Q		V		
17+30	0.3438	0.09	Q		V		
17+35	0.3444	0.09	Q		V		
17+40	0.3450	0.09	Q		V		
17+45	0.3456	0.09	Q		V		
17+50	0.3462	0.08	Q		V		
17+55	0.3467	0.07	Q		V		
18+ 0	0.3472	0.07	Q		V		
18+ 5	0.3477	0.07	Q		V		
18+10	0.3481	0.07	Q		V		
18+15	0.3486	0.07	Q		V		
18+20	0.3491	0.07	Q		V		
18+25	0.3496	0.07	Q		V		
18+30	0.3501	0.07	Q		V		
18+35	0.3505	0.06	Q		V		
18+40	0.3509	0.05	Q		V		
18+45	0.3513	0.05	Q		V		
18+50	0.3516	0.04	Q		V		
18+55	0.3518	0.04	Q		V		

19+ 0	0.3521	0.04	Q				V
19+ 5	0.3524	0.05	Q				V
19+10	0.3528	0.05	Q				V
19+15	0.3531	0.05	Q				V
19+20	0.3536	0.07	Q				V
19+25	0.3541	0.07	Q				V
19+30	0.3546	0.07	Q				V
19+35	0.3550	0.06	Q				V
19+40	0.3554	0.05	Q				V
19+45	0.3557	0.05	Q				V
19+50	0.3560	0.04	Q				V
19+55	0.3563	0.04	Q				V
20+ 0	0.3565	0.04	Q				V
20+ 5	0.3568	0.05	Q				V
20+10	0.3572	0.05	Q				V
20+15	0.3576	0.05	Q				V
20+20	0.3580	0.05	Q				V
20+25	0.3583	0.05	Q				V
20+30	0.3587	0.05	Q				V
20+35	0.3591	0.05	Q				V
20+40	0.3594	0.05	Q				V
20+45	0.3598	0.05	Q				V
20+50	0.3601	0.04	Q				V
20+55	0.3604	0.04	Q				V
21+ 0	0.3606	0.04	Q				V
21+ 5	0.3609	0.05	Q				V
21+10	0.3613	0.05	Q				V
21+15	0.3617	0.05	Q				V
21+20	0.3620	0.04	Q				V
21+25	0.3622	0.04	Q				V
21+30	0.3625	0.04	Q				V
21+35	0.3628	0.05	Q				V
21+40	0.3631	0.05	Q				V
21+45	0.3635	0.05	Q				V
21+50	0.3638	0.04	Q				V
21+55	0.3641	0.04	Q				V
22+ 0	0.3643	0.04	Q				V
22+ 5	0.3646	0.05	Q				V
22+10	0.3650	0.05	Q				V
22+15	0.3654	0.05	Q				V
22+20	0.3657	0.04	Q				V
22+25	0.3659	0.04	Q				V
22+30	0.3662	0.04	Q				V
22+35	0.3664	0.04	Q				V
22+40	0.3667	0.04	Q				V
22+45	0.3669	0.04	Q				V
22+50	0.3672	0.04	Q				V
22+55	0.3674	0.04	Q				V
23+ 0	0.3676	0.04	Q				V
23+ 5	0.3679	0.04	Q				V
23+10	0.3681	0.04	Q				V
23+15	0.3684	0.04	Q				V
23+20	0.3686	0.04	Q				V
23+25	0.3689	0.04	Q				V
23+30	0.3691	0.04	Q				V
23+35	0.3694	0.04	Q				V
23+40	0.3696	0.04	Q				V
23+45	0.3699	0.04	Q				V
23+50	0.3701	0.04	Q				V
23+55	0.3704	0.04	Q				V
24+ 0	0.3706	0.04	Q				V
24+ 5	0.3707	0.01	Q				V
24+10	0.3707	0.00	Q				V

APPENDIX D.2: AREA "B" – 2-YEAR, 24-HOUR STORM EVENT

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 03/26/21 File: ARBP242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6279

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
UNIT HYDROGRAPH ANALYSIS, 2-YEAR STORM EVENT
FILENAME: ARBP

Drainage Area = 3.21(Ac.) = 0.005 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.21(Ac.) = 0.005 Sq. Mi.
Length along longest watercourse = 468.00(Ft.)
Length along longest watercourse measured to centroid = 197.00(Ft.)
Length along longest watercourse = 0.089 Mi.
Length along longest watercourse measured to centroid = 0.037 Mi.
Difference in elevation = 11.20(Ft.)
Slope along watercourse = 126.3590 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.016 Hr.
Lag time = 0.98 Min.
25% of lag time = 0.25 Min.
40% of lag time = 0.39 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.21	2.50	8.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.21	6.50	20.86

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.210	56.86	0.900

Total Area Entered = 3.21(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.9	36.9	0.698	0.900	0.133	1.000	0.133
					Sum (F) =	0.133

Area averaged mean soil loss (F) (In/Hr) = 0.133
Minimum soil loss rate ((In/Hr)) = 0.066
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	508.666	71.348	2.308
2	0.167	1017.332	28.652	0.927
			Sum = 100.000 Sum=	3.235

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.235)	0.004	0.016
2	0.17	0.07	0.020	(0.234)	0.004	0.016
3	0.25	0.07	0.020	(0.233)	0.004	0.016
4	0.33	0.10	0.030	(0.232)	0.005	0.025
5	0.42	0.10	0.030	(0.232)	0.005	0.025
6	0.50	0.10	0.030	(0.231)	0.005	0.025
7	0.58	0.10	0.030	(0.230)	0.005	0.025
8	0.67	0.10	0.030	(0.229)	0.005	0.025
9	0.75	0.10	0.030	(0.228)	0.005	0.025
10	0.83	0.13	0.040	(0.227)	0.007	0.033
11	0.92	0.13	0.040	(0.226)	0.007	0.033
12	1.00	0.13	0.040	(0.225)	0.007	0.033
13	1.08	0.10	0.030	(0.224)	0.005	0.025
14	1.17	0.10	0.030	(0.224)	0.005	0.025
15	1.25	0.10	0.030	(0.223)	0.005	0.025
16	1.33	0.10	0.030	(0.222)	0.005	0.025
17	1.42	0.10	0.030	(0.221)	0.005	0.025
18	1.50	0.10	0.030	(0.220)	0.005	0.025
19	1.58	0.10	0.030	(0.219)	0.005	0.025
20	1.67	0.10	0.030	(0.218)	0.005	0.025
21	1.75	0.10	0.030	(0.217)	0.005	0.025
22	1.83	0.13	0.040	(0.216)	0.007	0.033
23	1.92	0.13	0.040	(0.216)	0.007	0.033
24	2.00	0.13	0.040	(0.215)	0.007	0.033
25	2.08	0.13	0.040	(0.214)	0.007	0.033
26	2.17	0.13	0.040	(0.213)	0.007	0.033
27	2.25	0.13	0.040	(0.212)	0.007	0.033
28	2.33	0.13	0.040	(0.211)	0.007	0.033
29	2.42	0.13	0.040	(0.210)	0.007	0.033
30	2.50	0.13	0.040	(0.210)	0.007	0.033
31	2.58	0.17	0.050	(0.209)	0.009	0.041
32	2.67	0.17	0.050	(0.208)	0.009	0.041
33	2.75	0.17	0.050	(0.207)	0.009	0.041
34	2.83	0.17	0.050	(0.206)	0.009	0.041
35	2.92	0.17	0.050	(0.205)	0.009	0.041
36	3.00	0.17	0.050	(0.204)	0.009	0.041
37	3.08	0.17	0.050	(0.204)	0.009	0.041
38	3.17	0.17	0.050	(0.203)	0.009	0.041
39	3.25	0.17	0.050	(0.202)	0.009	0.041
40	3.33	0.17	0.050	(0.201)	0.009	0.041

41	3.42	0.17	0.050	(0.200)	0.009	0.041
42	3.50	0.17	0.050	(0.199)	0.009	0.041
43	3.58	0.17	0.050	(0.199)	0.009	0.041
44	3.67	0.17	0.050	(0.198)	0.009	0.041
45	3.75	0.17	0.050	(0.197)	0.009	0.041
46	3.83	0.20	0.060	(0.196)	0.011	0.049
47	3.92	0.20	0.060	(0.195)	0.011	0.049
48	4.00	0.20	0.060	(0.194)	0.011	0.049
49	4.08	0.20	0.060	(0.194)	0.011	0.049
50	4.17	0.20	0.060	(0.193)	0.011	0.049
51	4.25	0.20	0.060	(0.192)	0.011	0.049
52	4.33	0.23	0.070	(0.191)	0.013	0.057
53	4.42	0.23	0.070	(0.190)	0.013	0.057
54	4.50	0.23	0.070	(0.189)	0.013	0.057
55	4.58	0.23	0.070	(0.189)	0.013	0.057
56	4.67	0.23	0.070	(0.188)	0.013	0.057
57	4.75	0.23	0.070	(0.187)	0.013	0.057
58	4.83	0.27	0.080	(0.186)	0.014	0.066
59	4.92	0.27	0.080	(0.185)	0.014	0.066
60	5.00	0.27	0.080	(0.185)	0.014	0.066
61	5.08	0.20	0.060	(0.184)	0.011	0.049
62	5.17	0.20	0.060	(0.183)	0.011	0.049
63	5.25	0.20	0.060	(0.182)	0.011	0.049
64	5.33	0.23	0.070	(0.181)	0.013	0.057
65	5.42	0.23	0.070	(0.181)	0.013	0.057
66	5.50	0.23	0.070	(0.180)	0.013	0.057
67	5.58	0.27	0.080	(0.179)	0.014	0.066
68	5.67	0.27	0.080	(0.178)	0.014	0.066
69	5.75	0.27	0.080	(0.177)	0.014	0.066
70	5.83	0.27	0.080	(0.177)	0.014	0.066
71	5.92	0.27	0.080	(0.176)	0.014	0.066
72	6.00	0.27	0.080	(0.175)	0.014	0.066
73	6.08	0.30	0.090	(0.174)	0.016	0.074
74	6.17	0.30	0.090	(0.174)	0.016	0.074
75	6.25	0.30	0.090	(0.173)	0.016	0.074
76	6.33	0.30	0.090	(0.172)	0.016	0.074
77	6.42	0.30	0.090	(0.171)	0.016	0.074
78	6.50	0.30	0.090	(0.170)	0.016	0.074
79	6.58	0.33	0.100	(0.170)	0.018	0.082
80	6.67	0.33	0.100	(0.169)	0.018	0.082
81	6.75	0.33	0.100	(0.168)	0.018	0.082
82	6.83	0.33	0.100	(0.167)	0.018	0.082
83	6.92	0.33	0.100	(0.167)	0.018	0.082
84	7.00	0.33	0.100	(0.166)	0.018	0.082
85	7.08	0.33	0.100	(0.165)	0.018	0.082
86	7.17	0.33	0.100	(0.164)	0.018	0.082
87	7.25	0.33	0.100	(0.164)	0.018	0.082
88	7.33	0.37	0.110	(0.163)	0.020	0.090
89	7.42	0.37	0.110	(0.162)	0.020	0.090
90	7.50	0.37	0.110	(0.161)	0.020	0.090
91	7.58	0.40	0.120	(0.161)	0.022	0.098
92	7.67	0.40	0.120	(0.160)	0.022	0.098
93	7.75	0.40	0.120	(0.159)	0.022	0.098
94	7.83	0.43	0.130	(0.158)	0.023	0.107
95	7.92	0.43	0.130	(0.158)	0.023	0.107
96	8.00	0.43	0.130	(0.157)	0.023	0.107
97	8.08	0.50	0.150	(0.156)	0.027	0.123
98	8.17	0.50	0.150	(0.156)	0.027	0.123
99	8.25	0.50	0.150	(0.155)	0.027	0.123
100	8.33	0.50	0.150	(0.154)	0.027	0.123
101	8.42	0.50	0.150	(0.153)	0.027	0.123
102	8.50	0.50	0.150	(0.153)	0.027	0.123
103	8.58	0.53	0.160	(0.152)	0.029	0.131
104	8.67	0.53	0.160	(0.151)	0.029	0.131
105	8.75	0.53	0.160	(0.151)	0.029	0.131
106	8.83	0.57	0.170	(0.150)	0.031	0.139
107	8.92	0.57	0.170	(0.149)	0.031	0.139
108	9.00	0.57	0.170	(0.148)	0.031	0.139
109	9.08	0.63	0.190	(0.148)	0.034	0.156
110	9.17	0.63	0.190	(0.147)	0.034	0.156
111	9.25	0.63	0.190	(0.146)	0.034	0.156

112	9.33	0.67	0.200	(0.146)	0.036	0.164
113	9.42	0.67	0.200	(0.145)	0.036	0.164
114	9.50	0.67	0.200	(0.144)	0.036	0.164
115	9.58	0.70	0.210	(0.144)	0.038	0.172
116	9.67	0.70	0.210	(0.143)	0.038	0.172
117	9.75	0.70	0.210	(0.142)	0.038	0.172
118	9.83	0.73	0.220	(0.141)	0.040	0.180
119	9.92	0.73	0.220	(0.141)	0.040	0.180
120	10.00	0.73	0.220	(0.140)	0.040	0.180
121	10.08	0.50	0.150	(0.139)	0.027	0.123
122	10.17	0.50	0.150	(0.139)	0.027	0.123
123	10.25	0.50	0.150	(0.138)	0.027	0.123
124	10.33	0.50	0.150	(0.137)	0.027	0.123
125	10.42	0.50	0.150	(0.137)	0.027	0.123
126	10.50	0.50	0.150	(0.136)	0.027	0.123
127	10.58	0.67	0.200	(0.135)	0.036	0.164
128	10.67	0.67	0.200	(0.135)	0.036	0.164
129	10.75	0.67	0.200	(0.134)	0.036	0.164
130	10.83	0.67	0.200	(0.133)	0.036	0.164
131	10.92	0.67	0.200	(0.133)	0.036	0.164
132	11.00	0.67	0.200	(0.132)	0.036	0.164
133	11.08	0.63	0.190	(0.131)	0.034	0.156
134	11.17	0.63	0.190	(0.131)	0.034	0.156
135	11.25	0.63	0.190	(0.130)	0.034	0.156
136	11.33	0.63	0.190	(0.130)	0.034	0.156
137	11.42	0.63	0.190	(0.129)	0.034	0.156
138	11.50	0.63	0.190	(0.128)	0.034	0.156
139	11.58	0.57	0.170	(0.128)	0.031	0.139
140	11.67	0.57	0.170	(0.127)	0.031	0.139
141	11.75	0.57	0.170	(0.126)	0.031	0.139
142	11.83	0.60	0.180	(0.126)	0.032	0.148
143	11.92	0.60	0.180	(0.125)	0.032	0.148
144	12.00	0.60	0.180	(0.124)	0.032	0.148
145	12.08	0.83	0.250	(0.124)	0.045	0.205
146	12.17	0.83	0.250	(0.123)	0.045	0.205
147	12.25	0.83	0.250	(0.123)	0.045	0.205
148	12.33	0.87	0.260	(0.122)	0.047	0.213
149	12.42	0.87	0.260	(0.121)	0.047	0.213
150	12.50	0.87	0.260	(0.121)	0.047	0.213
151	12.58	0.93	0.280	(0.120)	0.050	0.230
152	12.67	0.93	0.280	(0.120)	0.050	0.230
153	12.75	0.93	0.280	(0.119)	0.050	0.230
154	12.83	0.97	0.290	(0.118)	0.052	0.238
155	12.92	0.97	0.290	(0.118)	0.052	0.238
156	13.00	0.97	0.290	(0.117)	0.052	0.238
157	13.08	1.13	0.340	(0.117)	0.061	0.279
158	13.17	1.13	0.340	(0.116)	0.061	0.279
159	13.25	1.13	0.340	(0.115)	0.061	0.279
160	13.33	1.13	0.340	(0.115)	0.061	0.279
161	13.42	1.13	0.340	(0.114)	0.061	0.279
162	13.50	1.13	0.340	(0.114)	0.061	0.279
163	13.58	0.77	0.230	(0.113)	0.041	0.189
164	13.67	0.77	0.230	(0.112)	0.041	0.189
165	13.75	0.77	0.230	(0.112)	0.041	0.189
166	13.83	0.77	0.230	(0.111)	0.041	0.189
167	13.92	0.77	0.230	(0.111)	0.041	0.189
168	14.00	0.77	0.230	(0.110)	0.041	0.189
169	14.08	0.90	0.270	(0.110)	0.049	0.221
170	14.17	0.90	0.270	(0.109)	0.049	0.221
171	14.25	0.90	0.270	(0.109)	0.049	0.221
172	14.33	0.87	0.260	(0.108)	0.047	0.213
173	14.42	0.87	0.260	(0.107)	0.047	0.213
174	14.50	0.87	0.260	(0.107)	0.047	0.213
175	14.58	0.87	0.260	(0.106)	0.047	0.213
176	14.67	0.87	0.260	(0.106)	0.047	0.213
177	14.75	0.87	0.260	(0.105)	0.047	0.213
178	14.83	0.83	0.250	(0.105)	0.045	0.205
179	14.92	0.83	0.250	(0.104)	0.045	0.205
180	15.00	0.83	0.250	(0.104)	0.045	0.205
181	15.08	0.80	0.240	(0.103)	0.043	0.197
182	15.17	0.80	0.240	(0.103)	0.043	0.197

183	15.25	0.80	0.240	(0.102)	0.043	0.197
184	15.33	0.77	0.230	(0.102)	0.041	0.189
185	15.42	0.77	0.230	(0.101)	0.041	0.189
186	15.50	0.77	0.230	(0.100)	0.041	0.189
187	15.58	0.63	0.190	(0.100)	0.034	0.156
188	15.67	0.63	0.190	(0.099)	0.034	0.156
189	15.75	0.63	0.190	(0.099)	0.034	0.156
190	15.83	0.63	0.190	(0.098)	0.034	0.156
191	15.92	0.63	0.190	(0.098)	0.034	0.156
192	16.00	0.63	0.190	(0.097)	0.034	0.156
193	16.08	0.13	0.040	(0.097)	0.007	0.033
194	16.17	0.13	0.040	(0.096)	0.007	0.033
195	16.25	0.13	0.040	(0.096)	0.007	0.033
196	16.33	0.13	0.040	(0.095)	0.007	0.033
197	16.42	0.13	0.040	(0.095)	0.007	0.033
198	16.50	0.13	0.040	(0.094)	0.007	0.033
199	16.58	0.10	0.030	(0.094)	0.005	0.025
200	16.67	0.10	0.030	(0.094)	0.005	0.025
201	16.75	0.10	0.030	(0.093)	0.005	0.025
202	16.83	0.10	0.030	(0.093)	0.005	0.025
203	16.92	0.10	0.030	(0.092)	0.005	0.025
204	17.00	0.10	0.030	(0.092)	0.005	0.025
205	17.08	0.17	0.050	(0.091)	0.009	0.041
206	17.17	0.17	0.050	(0.091)	0.009	0.041
207	17.25	0.17	0.050	(0.090)	0.009	0.041
208	17.33	0.17	0.050	(0.090)	0.009	0.041
209	17.42	0.17	0.050	(0.089)	0.009	0.041
210	17.50	0.17	0.050	(0.089)	0.009	0.041
211	17.58	0.17	0.050	(0.088)	0.009	0.041
212	17.67	0.17	0.050	(0.088)	0.009	0.041
213	17.75	0.17	0.050	(0.088)	0.009	0.041
214	17.83	0.13	0.040	(0.087)	0.007	0.033
215	17.92	0.13	0.040	(0.087)	0.007	0.033
216	18.00	0.13	0.040	(0.086)	0.007	0.033
217	18.08	0.13	0.040	(0.086)	0.007	0.033
218	18.17	0.13	0.040	(0.085)	0.007	0.033
219	18.25	0.13	0.040	(0.085)	0.007	0.033
220	18.33	0.13	0.040	(0.085)	0.007	0.033
221	18.42	0.13	0.040	(0.084)	0.007	0.033
222	18.50	0.13	0.040	(0.084)	0.007	0.033
223	18.58	0.10	0.030	(0.083)	0.005	0.025
224	18.67	0.10	0.030	(0.083)	0.005	0.025
225	18.75	0.10	0.030	(0.083)	0.005	0.025
226	18.83	0.07	0.020	(0.082)	0.004	0.016
227	18.92	0.07	0.020	(0.082)	0.004	0.016
228	19.00	0.07	0.020	(0.081)	0.004	0.016
229	19.08	0.10	0.030	(0.081)	0.005	0.025
230	19.17	0.10	0.030	(0.081)	0.005	0.025
231	19.25	0.10	0.030	(0.080)	0.005	0.025
232	19.33	0.13	0.040	(0.080)	0.007	0.033
233	19.42	0.13	0.040	(0.080)	0.007	0.033
234	19.50	0.13	0.040	(0.079)	0.007	0.033
235	19.58	0.10	0.030	(0.079)	0.005	0.025
236	19.67	0.10	0.030	(0.078)	0.005	0.025
237	19.75	0.10	0.030	(0.078)	0.005	0.025
238	19.83	0.07	0.020	(0.078)	0.004	0.016
239	19.92	0.07	0.020	(0.077)	0.004	0.016
240	20.00	0.07	0.020	(0.077)	0.004	0.016
241	20.08	0.10	0.030	(0.077)	0.005	0.025
242	20.17	0.10	0.030	(0.076)	0.005	0.025
243	20.25	0.10	0.030	(0.076)	0.005	0.025
244	20.33	0.10	0.030	(0.076)	0.005	0.025
245	20.42	0.10	0.030	(0.075)	0.005	0.025
246	20.50	0.10	0.030	(0.075)	0.005	0.025
247	20.58	0.10	0.030	(0.075)	0.005	0.025
248	20.67	0.10	0.030	(0.074)	0.005	0.025
249	20.75	0.10	0.030	(0.074)	0.005	0.025
250	20.83	0.07	0.020	(0.074)	0.004	0.016
251	20.92	0.07	0.020	(0.074)	0.004	0.016
252	21.00	0.07	0.020	(0.073)	0.004	0.016
253	21.08	0.10	0.030	(0.073)	0.005	0.025

```
254  21.17     0.10      0.030       (  0.073)       0.005        0.025
255  21.25     0.10      0.030       (  0.072)       0.005        0.025
256  21.33     0.07      0.020       (  0.072)       0.004        0.016
257  21.42     0.07      0.020       (  0.072)       0.004        0.016
258  21.50     0.07      0.020       (  0.072)       0.004        0.016
259  21.58     0.10      0.030       (  0.071)       0.005        0.025
260  21.67     0.10      0.030       (  0.071)       0.005        0.025
261  21.75     0.10      0.030       (  0.071)       0.005        0.025
262  21.83     0.07      0.020       (  0.071)       0.004        0.016
263  21.92     0.07      0.020       (  0.070)       0.004        0.016
264  22.00     0.07      0.020       (  0.070)       0.004        0.016
265  22.08     0.10      0.030       (  0.070)       0.005        0.025
266  22.17     0.10      0.030       (  0.070)       0.005        0.025
267  22.25     0.10      0.030       (  0.069)       0.005        0.025
268  22.33     0.07      0.020       (  0.069)       0.004        0.016
269  22.42     0.07      0.020       (  0.069)       0.004        0.016
270  22.50     0.07      0.020       (  0.069)       0.004        0.016
271  22.58     0.07      0.020       (  0.069)       0.004        0.016
272  22.67     0.07      0.020       (  0.068)       0.004        0.016
273  22.75     0.07      0.020       (  0.068)       0.004        0.016
274  22.83     0.07      0.020       (  0.068)       0.004        0.016
275  22.92     0.07      0.020       (  0.068)       0.004        0.016
276  23.00     0.07      0.020       (  0.068)       0.004        0.016
277  23.08     0.07      0.020       (  0.067)       0.004        0.016
278  23.17     0.07      0.020       (  0.067)       0.004        0.016
279  23.25     0.07      0.020       (  0.067)       0.004        0.016
280  23.33     0.07      0.020       (  0.067)       0.004        0.016
281  23.42     0.07      0.020       (  0.067)       0.004        0.016
282  23.50     0.07      0.020       (  0.067)       0.004        0.016
283  23.58     0.07      0.020       (  0.067)       0.004        0.016
284  23.67     0.07      0.020       (  0.067)       0.004        0.016
285  23.75     0.07      0.020       (  0.067)       0.004        0.016
286  23.83     0.07      0.020       (  0.066)       0.004        0.016
287  23.92     0.07      0.020       (  0.066)       0.004        0.016
288  24.00     0.07      0.020       (  0.066)       0.004        0.016
               (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    24.6
      Flood volume = Effective rainfall      2.05(In)
       times area       3.2(Ac.)/[(In)/(Ft.)] =       0.5(Ac.Ft)
      Total soil loss =      0.45(In)
      Total soil loss =     0.120(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =       23887.1 Cubic Feet
      Total soil loss =        5243.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.902(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0003      0.04  Q         |         |         |         |
   0+10       0.0006      0.05  Q         |         |         |         |
   0+15       0.0010      0.05  Q         |         |         |         |
   0+20       0.0015      0.07  Q         |         |         |         |
   0+25       0.0020      0.08  Q         |         |         |         |
   0+30       0.0026      0.08  Q         |         |         |         |
   0+35       0.0031      0.08  Q         |         |         |         |
   0+40       0.0037      0.08  Q         |         |         |         |
   0+45       0.0042      0.08  Q         |         |         |         |
   0+50       0.0049      0.10  Q         |         |         |         |
   0+55       0.0056      0.11  Q         |         |         |         |
   1+ 0       0.0064      0.11  Q         |         |         |         |
   1+ 5       0.0070      0.09  Q         |         |         |         |
   1+10       0.0075      0.08  Q         |         |         |         |
   1+15       0.0081      0.08  Q         |         |         |         |
```

1+20	0.0086	0.08	Q	|	|	|	|
1+25	0.0092	0.08	Q	|	|	|	|
1+30	0.0097	0.08	Q	|	|	|	|
1+35	0.0103	0.08	Q	|	|	|	|
1+40	0.0108	0.08	Q	|	|	|	|
1+45	0.0114	0.08	Q	|	|	|	|
1+50	0.0120	0.10	Q	|	|	|	|
1+55	0.0128	0.11	Q	|	|	|	|
2+ 0	0.0135	0.11	Q	|	|	|	|
2+ 5	0.0142	0.11	QV	|	|	|	|
2+10	0.0150	0.11	QV	|	|	|	|
2+15	0.0157	0.11	QV	|	|	|	|
2+20	0.0164	0.11	QV	|	|	|	|
2+25	0.0172	0.11	QV	|	|	|	|
2+30	0.0179	0.11	QV	|	|	|	|
2+35	0.0187	0.13	QV	|	|	|	|
2+40	0.0197	0.13	QV	|	|	|	|
2+45	0.0206	0.13	QV	|	|	|	|
2+50	0.0215	0.13	QV	|	|	|	|
2+55	0.0224	0.13	QV	|	|	|	|
3+ 0	0.0233	0.13	QV	|	|	|	|
3+ 5	0.0242	0.13	QV	|	|	|	|
3+10	0.0251	0.13	QV	|	|	|	|
3+15	0.0261	0.13	QV	|	|	|	|
3+20	0.0270	0.13	QV	|	|	|	|
3+25	0.0279	0.13	Q V	|	|	|	|
3+30	0.0288	0.13	Q V	|	|	|	|
3+35	0.0297	0.13	Q V	|	|	|	|
3+40	0.0306	0.13	Q V	|	|	|	|
3+45	0.0315	0.13	Q V	|	|	|	|
3+50	0.0326	0.15	Q V	|	|	|	|
3+55	0.0337	0.16	Q V	|	|	|	|
4+ 0	0.0348	0.16	Q V	|	|	|	|
4+ 5	0.0359	0.16	Q V	|	|	|	|
4+10	0.0370	0.16	Q V	|	|	|	|
4+15	0.0381	0.16	Q V	|	|	|	|
4+20	0.0393	0.18	Q V	|	|	|	|
4+25	0.0406	0.19	Q V	|	|	|	|
4+30	0.0419	0.19	Q V	|	|	|	|
4+35	0.0431	0.19	Q V	|	|	|	|
4+40	0.0444	0.19	Q V	|	|	|	|
4+45	0.0457	0.19	Q V	|	|	|	|
4+50	0.0471	0.20	Q V	|	|	|	|
4+55	0.0486	0.21	Q V	|	|	|	|
5+ 0	0.0500	0.21	Q V	|	|	|	|
5+ 5	0.0512	0.17	Q V	|	|	|	|
5+10	0.0523	0.16	Q V	|	|	|	|
5+15	0.0534	0.16	Q V	|	|	|	|
5+20	0.0547	0.18	Q V	|	|	|	|
5+25	0.0559	0.19	Q V	|	|	|	|
5+30	0.0572	0.19	Q V	|	|	|	|
5+35	0.0586	0.20	Q V	|	|	|	|
5+40	0.0601	0.21	Q V	|	|	|	|
5+45	0.0615	0.21	Q V	|	|	|	|
5+50	0.0630	0.21	Q V	|	|	|	|
5+55	0.0645	0.21	Q V	|	|	|	|
6+ 0	0.0659	0.21	Q V	|	|	|	|
6+ 5	0.0675	0.23	Q V	|	|	|	|
6+10	0.0692	0.24	Q V	|	|	|	|
6+15	0.0708	0.24	Q V	|	|	|	|
6+20	0.0725	0.24	Q V	|	|	|	|
6+25	0.0741	0.24	Q V	|	|	|	|
6+30	0.0758	0.24	Q V	|	|	|	|
6+35	0.0775	0.26	|Q V	|	|	|	|
6+40	0.0794	0.27	|Q V	|	|	|	|
6+45	0.0812	0.27	|Q V	|	|	|	|
6+50	0.0830	0.27	|Q V	|	|	|	|
6+55	0.0848	0.27	|Q V	|	|	|	|
7+ 0	0.0867	0.27	|Q V	|	|	|	|
7+ 5	0.0885	0.27	|Q V	|	|	|	|
7+10	0.0903	0.27	|Q V	|	|	|	|

7+15	0.0922	0.27	Q V				
7+20	0.0941	0.28	Q V				
7+25	0.0961	0.29	Q V				
7+30	0.0981	0.29	Q V				
7+35	0.1003	0.31	Q V				
7+40	0.1025	0.32	Q V				
7+45	0.1047	0.32	Q V				
7+50	0.1070	0.34	Q V				
7+55	0.1094	0.35	Q V				
8+ 0	0.1117	0.35	Q V				
8+ 5	0.1144	0.38	Q V				
8+10	0.1171	0.40	Q V				
8+15	0.1199	0.40	Q V				
8+20	0.1226	0.40	Q V				
8+25	0.1253	0.40	Q V				
8+30	0.1281	0.40	Q V				
8+35	0.1310	0.42	Q V				
8+40	0.1339	0.42	Q V				
8+45	0.1368	0.42	Q V				
8+50	0.1399	0.44	Q V				
8+55	0.1430	0.45	Q V				
9+ 0	0.1461	0.45	Q V				
9+ 5	0.1494	0.49	Q V				
9+10	0.1529	0.50	Q V				
9+15	0.1564	0.50	Q V				
9+20	0.1600	0.52	Q V				
9+25	0.1636	0.53	Q V				
9+30	0.1673	0.53	Q V				
9+35	0.1711	0.55	Q V				
9+40	0.1749	0.56	Q V				
9+45	0.1788	0.56	Q V				
9+50	0.1827	0.58	Q V				
9+55	0.1868	0.58	Q V				
10+ 0	0.1908	0.58	Q V				
10+ 5	0.1939	0.45	Q V				
10+10	0.1966	0.40	Q V				
10+15	0.1994	0.40	Q V				
10+20	0.2021	0.40	Q V				
10+25	0.2049	0.40	Q V				
10+30	0.2076	0.40	Q V				
10+35	0.2110	0.49	Q V				
10+40	0.2146	0.53	Q V				
10+45	0.2183	0.53	Q V				
10+50	0.2220	0.53	Q V				
10+55	0.2256	0.53	Q V				
11+ 0	0.2293	0.53	Q V				
11+ 5	0.2328	0.51	Q V				
11+10	0.2363	0.50	Q V				
11+15	0.2397	0.50	Q V				
11+20	0.2432	0.50	Q V				
11+25	0.2467	0.50	Q V				
11+30	0.2502	0.50	Q V				
11+35	0.2534	0.47	Q V				
11+40	0.2565	0.45	Q V				
11+45	0.2596	0.45	Q V				
11+50	0.2628	0.47	Q V				
11+55	0.2661	0.48	Q V				
12+ 0	0.2694	0.48	Q V				
12+ 5	0.2736	0.61	Q V				
12+10	0.2782	0.66	Q V				
12+15	0.2827	0.66	Q V				
12+20	0.2874	0.68	Q V				
12+25	0.2922	0.69	Q V				
12+30	0.2970	0.69	Q V				
12+35	0.3020	0.73	Q V				
12+40	0.3071	0.74	Q V				
12+45	0.3122	0.74	Q V				
12+50	0.3175	0.76	Q V				
12+55	0.3228	0.77	Q V				
13+ 0	0.3281	0.77	Q V				
13+ 5	0.3340	0.86	Q V				

13+10	0.3402	0.90	Q			V			
13+15	0.3464	0.90	Q			V			
13+20	0.3527	0.90	Q			V			
13+25	0.3589	0.90	Q			V			
13+30	0.3651	0.90	Q			V			
13+35	0.3699	0.69	Q			V			
13+40	0.3741	0.61	Q			V			
13+45	0.3783	0.61	Q			V			
13+50	0.3825	0.61	Q			V			
13+55	0.3867	0.61	Q			V			
14+ 0	0.3909	0.61	Q			V			
14+ 5	0.3956	0.69	Q			V			
14+10	0.4005	0.72	Q			V			
14+15	0.4055	0.72	Q			V			
14+20	0.4103	0.70	Q			V			
14+25	0.4150	0.69	Q			V			
14+30	0.4198	0.69	Q			V			
14+35	0.4245	0.69	Q			V			
14+40	0.4293	0.69	Q			V			
14+45	0.4340	0.69	Q			V			
14+50	0.4387	0.67	Q			V			
14+55	0.4432	0.66	Q			V			
15+ 0	0.4478	0.66	Q			V			
15+ 5	0.4522	0.64	Q			V			
15+10	0.4566	0.64	Q			V			
15+15	0.4610	0.64	Q			V			
15+20	0.4653	0.62	Q			V			
15+25	0.4695	0.61	Q			V			
15+30	0.4737	0.61	Q			V			
15+35	0.4774	0.53	Q			V			
15+40	0.4808	0.50	Q			V			
15+45	0.4843	0.50	Q			V			
15+50	0.4878	0.50	Q			V			
15+55	0.4913	0.50	Q			V			
16+ 0	0.4947	0.50	Q			V			
16+ 5	0.4962	0.22	Q			V			
16+10	0.4970	0.11	Q			V			
16+15	0.4977	0.11	Q			V			
16+20	0.4984	0.11	Q			V			
16+25	0.4992	0.11	Q			V			
16+30	0.4999	0.11	Q			V			
16+35	0.5005	0.09	Q			V			
16+40	0.5011	0.08	Q			V			
16+45	0.5016	0.08	Q			V			
16+50	0.5022	0.08	Q			V			
16+55	0.5027	0.08	Q			V			
17+ 0	0.5032	0.08	Q			V			
17+ 5	0.5041	0.12	Q			V			
17+10	0.5050	0.13	Q			V			
17+15	0.5059	0.13	Q			V			
17+20	0.5068	0.13	Q			V			
17+25	0.5077	0.13	Q			V			
17+30	0.5086	0.13	Q			V			
17+35	0.5095	0.13	Q			V			
17+40	0.5105	0.13	Q			V			
17+45	0.5114	0.13	Q			V			
17+50	0.5122	0.11	Q			V			
17+55	0.5129	0.11	Q			V			
18+ 0	0.5136	0.11	Q			V			
18+ 5	0.5143	0.11	Q			V			
18+10	0.5151	0.11	Q			V			
18+15	0.5158	0.11	Q			V			
18+20	0.5165	0.11	Q			V			
18+25	0.5173	0.11	Q			V			
18+30	0.5180	0.11	Q			V			
18+35	0.5186	0.09	Q			V			
18+40	0.5192	0.08	Q			V			
18+45	0.5197	0.08	Q			V			
18+50	0.5201	0.06	Q			V			
18+55	0.5205	0.05	Q			V			
19+ 0	0.5208	0.05	Q			V			

19+ 5	0.5213	0.07	Q	|	|	|	V |
19+10	0.5219	0.08	Q	|	|	|	V |
19+15	0.5224	0.08	Q	|	|	|	V |
19+20	0.5231	0.10	Q	|	|	|	V |
19+25	0.5239	0.11	Q	|	|	|	V |
19+30	0.5246	0.11	Q	|	|	|	V |
19+35	0.5252	0.09	Q	|	|	|	V |
19+40	0.5257	0.08	Q	|	|	|	V |
19+45	0.5263	0.08	Q	|	|	|	V |
19+50	0.5267	0.06	Q	|	|	|	V |
19+55	0.5271	0.05	Q	|	|	|	V |
20+ 0	0.5274	0.05	Q	|	|	|	V |
20+ 5	0.5279	0.07	Q	|	|	|	V |
20+10	0.5285	0.08	Q	|	|	|	V |
20+15	0.5290	0.08	Q	|	|	|	V |
20+20	0.5296	0.08	Q	|	|	|	V |
20+25	0.5301	0.08	Q	|	|	|	V |
20+30	0.5307	0.08	Q	|	|	|	V |
20+35	0.5312	0.08	Q	|	|	|	V |
20+40	0.5318	0.08	Q	|	|	|	V |
20+45	0.5323	0.08	Q	|	|	|	V |
20+50	0.5327	0.06	Q	|	|	|	V |
20+55	0.5331	0.05	Q	|	|	|	V |
21+ 0	0.5335	0.05	Q	|	|	|	V |
21+ 5	0.5340	0.07	Q	|	|	|	V |
21+10	0.5345	0.08	Q	|	|	|	V |
21+15	0.5351	0.08	Q	|	|	|	V|
21+20	0.5355	0.06	Q	|	|	|	V|
21+25	0.5358	0.05	Q	|	|	|	V|
21+30	0.5362	0.05	Q	|	|	|	V|
21+35	0.5367	0.07	Q	|	|	|	V|
21+40	0.5372	0.08	Q	|	|	|	V|
21+45	0.5378	0.08	Q	|	|	|	V|
21+50	0.5382	0.06	Q	|	|	|	V|
21+55	0.5386	0.05	Q	|	|	|	V|
22+ 0	0.5389	0.05	Q	|	|	|	V|
22+ 5	0.5394	0.07	Q	|	|	|	V|
22+10	0.5400	0.08	Q	|	|	|	V|
22+15	0.5405	0.08	Q	|	|	|	V|
22+20	0.5410	0.06	Q	|	|	|	V|
22+25	0.5413	0.05	Q	|	|	|	V|
22+30	0.5417	0.05	Q	|	|	|	V|
22+35	0.5421	0.05	Q	|	|	|	V|
22+40	0.5424	0.05	Q	|	|	|	V|
22+45	0.5428	0.05	Q	|	|	|	V|
22+50	0.5431	0.05	Q	|	|	|	V|
22+55	0.5435	0.05	Q	|	|	|	V|
23+ 0	0.5439	0.05	Q	|	|	|	V|
23+ 5	0.5442	0.05	Q	|	|	|	V|
23+10	0.5446	0.05	Q	|	|	|	V|
23+15	0.5450	0.05	Q	|	|	|	V|
23+20	0.5453	0.05	Q	|	|	|	V|
23+25	0.5457	0.05	Q	|	|	|	V|
23+30	0.5461	0.05	Q	|	|	|	V|
23+35	0.5464	0.05	Q	|	|	|	V|
23+40	0.5468	0.05	Q	|	|	|	V|
23+45	0.5472	0.05	Q	|	|	|	V|
23+50	0.5475	0.05	Q	|	|	|	V|
23+55	0.5479	0.05	Q	|	|	|	V|
24+ 0	0.5483	0.05	Q	|	|	|	V|
24+ 5	0.5484	0.02	Q	|	|	|	V|

APPENDIX D.3: AREA "C" – 2-YEAR, 24-HOUR STORM EVENT

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 03/26/21 File: ARCP242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6279

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

SADDLEBACK INDUSTRIAL POST-PROJECT CONDITION HYDROLOGY
UNIT HYDROGRAPH ANALYSIS, 2-YEAR STORM EVENT
FILENAME: ARCP

Drainage Area = 1.87(Ac.) = 0.003 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.87(Ac.) = 0.003 Sq. Mi.
Length along longest watercourse = 478.00(Ft.)
Length along longest watercourse measured to centroid = 257.00(Ft.)
Length along longest watercourse = 0.091 Mi.
Length along longest watercourse measured to centroid = 0.049 Mi.
Difference in elevation = 6.76(Ft.)
Slope along watercourse = 74.6711 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.87	2.50	4.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.87	6.50	12.16

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.500(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.870	56.00	0.900

Total Area Entered = 1.87(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	412.724	65.943	1.243
2	0.167	825.448	34.057	0.642
			Sum = 100.000 Sum=	1.885

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.238)	0.004	0.016
2	0.17	0.07	0.020	(0.237)	0.004	0.016
3	0.25	0.07	0.020	(0.236)	0.004	0.016
4	0.33	0.10	0.030	(0.235)	0.005	0.025
5	0.42	0.10	0.030	(0.234)	0.005	0.025
6	0.50	0.10	0.030	(0.233)	0.005	0.025
7	0.58	0.10	0.030	(0.232)	0.005	0.025
8	0.67	0.10	0.030	(0.231)	0.005	0.025
9	0.75	0.10	0.030	(0.230)	0.005	0.025
10	0.83	0.13	0.040	(0.230)	0.007	0.033
11	0.92	0.13	0.040	(0.229)	0.007	0.033
12	1.00	0.13	0.040	(0.228)	0.007	0.033
13	1.08	0.10	0.030	(0.227)	0.005	0.025
14	1.17	0.10	0.030	(0.226)	0.005	0.025
15	1.25	0.10	0.030	(0.225)	0.005	0.025
16	1.33	0.10	0.030	(0.224)	0.005	0.025
17	1.42	0.10	0.030	(0.223)	0.005	0.025
18	1.50	0.10	0.030	(0.222)	0.005	0.025
19	1.58	0.10	0.030	(0.222)	0.005	0.025
20	1.67	0.10	0.030	(0.221)	0.005	0.025
21	1.75	0.10	0.030	(0.220)	0.005	0.025
22	1.83	0.13	0.040	(0.219)	0.007	0.033
23	1.92	0.13	0.040	(0.218)	0.007	0.033
24	2.00	0.13	0.040	(0.217)	0.007	0.033
25	2.08	0.13	0.040	(0.216)	0.007	0.033
26	2.17	0.13	0.040	(0.215)	0.007	0.033
27	2.25	0.13	0.040	(0.214)	0.007	0.033
28	2.33	0.13	0.040	(0.214)	0.007	0.033
29	2.42	0.13	0.040	(0.213)	0.007	0.033
30	2.50	0.13	0.040	(0.212)	0.007	0.033
31	2.58	0.17	0.050	(0.211)	0.009	0.041
32	2.67	0.17	0.050	(0.210)	0.009	0.041
33	2.75	0.17	0.050	(0.209)	0.009	0.041
34	2.83	0.17	0.050	(0.208)	0.009	0.041
35	2.92	0.17	0.050	(0.208)	0.009	0.041
36	3.00	0.17	0.050	(0.207)	0.009	0.041
37	3.08	0.17	0.050	(0.206)	0.009	0.041
38	3.17	0.17	0.050	(0.205)	0.009	0.041
39	3.25	0.17	0.050	(0.204)	0.009	0.041
40	3.33	0.17	0.050	(0.203)	0.009	0.041

41	3.42	0.17	0.050	(0.202)	0.009	0.041
42	3.50	0.17	0.050	(0.202)	0.009	0.041
43	3.58	0.17	0.050	(0.201)	0.009	0.041
44	3.67	0.17	0.050	(0.200)	0.009	0.041
45	3.75	0.17	0.050	(0.199)	0.009	0.041
46	3.83	0.20	0.060	(0.198)	0.011	0.049
47	3.92	0.20	0.060	(0.197)	0.011	0.049
48	4.00	0.20	0.060	(0.197)	0.011	0.049
49	4.08	0.20	0.060	(0.196)	0.011	0.049
50	4.17	0.20	0.060	(0.195)	0.011	0.049
51	4.25	0.20	0.060	(0.194)	0.011	0.049
52	4.33	0.23	0.070	(0.193)	0.013	0.057
53	4.42	0.23	0.070	(0.192)	0.013	0.057
54	4.50	0.23	0.070	(0.192)	0.013	0.057
55	4.58	0.23	0.070	(0.191)	0.013	0.057
56	4.67	0.23	0.070	(0.190)	0.013	0.057
57	4.75	0.23	0.070	(0.189)	0.013	0.057
58	4.83	0.27	0.080	(0.188)	0.014	0.066
59	4.92	0.27	0.080	(0.187)	0.014	0.066
60	5.00	0.27	0.080	(0.187)	0.014	0.066
61	5.08	0.20	0.060	(0.186)	0.011	0.049
62	5.17	0.20	0.060	(0.185)	0.011	0.049
63	5.25	0.20	0.060	(0.184)	0.011	0.049
64	5.33	0.23	0.070	(0.183)	0.013	0.057
65	5.42	0.23	0.070	(0.183)	0.013	0.057
66	5.50	0.23	0.070	(0.182)	0.013	0.057
67	5.58	0.27	0.080	(0.181)	0.014	0.066
68	5.67	0.27	0.080	(0.180)	0.014	0.066
69	5.75	0.27	0.080	(0.179)	0.014	0.066
70	5.83	0.27	0.080	(0.179)	0.014	0.066
71	5.92	0.27	0.080	(0.178)	0.014	0.066
72	6.00	0.27	0.080	(0.177)	0.014	0.066
73	6.08	0.30	0.090	(0.176)	0.016	0.074
74	6.17	0.30	0.090	(0.175)	0.016	0.074
75	6.25	0.30	0.090	(0.175)	0.016	0.074
76	6.33	0.30	0.090	(0.174)	0.016	0.074
77	6.42	0.30	0.090	(0.173)	0.016	0.074
78	6.50	0.30	0.090	(0.172)	0.016	0.074
79	6.58	0.33	0.100	(0.172)	0.018	0.082
80	6.67	0.33	0.100	(0.171)	0.018	0.082
81	6.75	0.33	0.100	(0.170)	0.018	0.082
82	6.83	0.33	0.100	(0.169)	0.018	0.082
83	6.92	0.33	0.100	(0.169)	0.018	0.082
84	7.00	0.33	0.100	(0.168)	0.018	0.082
85	7.08	0.33	0.100	(0.167)	0.018	0.082
86	7.17	0.33	0.100	(0.166)	0.018	0.082
87	7.25	0.33	0.100	(0.165)	0.018	0.082
88	7.33	0.37	0.110	(0.165)	0.020	0.090
89	7.42	0.37	0.110	(0.164)	0.020	0.090
90	7.50	0.37	0.110	(0.163)	0.020	0.090
91	7.58	0.40	0.120	(0.162)	0.022	0.098
92	7.67	0.40	0.120	(0.162)	0.022	0.098
93	7.75	0.40	0.120	(0.161)	0.022	0.098
94	7.83	0.43	0.130	(0.160)	0.023	0.107
95	7.92	0.43	0.130	(0.159)	0.023	0.107
96	8.00	0.43	0.130	(0.159)	0.023	0.107
97	8.08	0.50	0.150	(0.158)	0.027	0.123
98	8.17	0.50	0.150	(0.157)	0.027	0.123
99	8.25	0.50	0.150	(0.157)	0.027	0.123
100	8.33	0.50	0.150	(0.156)	0.027	0.123
101	8.42	0.50	0.150	(0.155)	0.027	0.123
102	8.50	0.50	0.150	(0.154)	0.027	0.123
103	8.58	0.53	0.160	(0.154)	0.029	0.131
104	8.67	0.53	0.160	(0.153)	0.029	0.131
105	8.75	0.53	0.160	(0.152)	0.029	0.131
106	8.83	0.57	0.170	(0.151)	0.031	0.139
107	8.92	0.57	0.170	(0.151)	0.031	0.139
108	9.00	0.57	0.170	(0.150)	0.031	0.139
109	9.08	0.63	0.190	(0.149)	0.034	0.156
110	9.17	0.63	0.190	(0.149)	0.034	0.156
111	9.25	0.63	0.190	(0.148)	0.034	0.156

112	9.33	0.67	0.200	(0.147)	0.036	0.164
113	9.42	0.67	0.200	(0.147)	0.036	0.164
114	9.50	0.67	0.200	(0.146)	0.036	0.164
115	9.58	0.70	0.210	(0.145)	0.038	0.172
116	9.67	0.70	0.210	(0.144)	0.038	0.172
117	9.75	0.70	0.210	(0.144)	0.038	0.172
118	9.83	0.73	0.220	(0.143)	0.040	0.180
119	9.92	0.73	0.220	(0.142)	0.040	0.180
120	10.00	0.73	0.220	(0.142)	0.040	0.180
121	10.08	0.50	0.150	(0.141)	0.027	0.123
122	10.17	0.50	0.150	(0.140)	0.027	0.123
123	10.25	0.50	0.150	(0.140)	0.027	0.123
124	10.33	0.50	0.150	(0.139)	0.027	0.123
125	10.42	0.50	0.150	(0.138)	0.027	0.123
126	10.50	0.50	0.150	(0.138)	0.027	0.123
127	10.58	0.67	0.200	(0.137)	0.036	0.164
128	10.67	0.67	0.200	(0.136)	0.036	0.164
129	10.75	0.67	0.200	(0.136)	0.036	0.164
130	10.83	0.67	0.200	(0.135)	0.036	0.164
131	10.92	0.67	0.200	(0.134)	0.036	0.164
132	11.00	0.67	0.200	(0.134)	0.036	0.164
133	11.08	0.63	0.190	(0.133)	0.034	0.156
134	11.17	0.63	0.190	(0.132)	0.034	0.156
135	11.25	0.63	0.190	(0.132)	0.034	0.156
136	11.33	0.63	0.190	(0.131)	0.034	0.156
137	11.42	0.63	0.190	(0.130)	0.034	0.156
138	11.50	0.63	0.190	(0.130)	0.034	0.156
139	11.58	0.57	0.170	(0.129)	0.031	0.139
140	11.67	0.57	0.170	(0.128)	0.031	0.139
141	11.75	0.57	0.170	(0.128)	0.031	0.139
142	11.83	0.60	0.180	(0.127)	0.032	0.148
143	11.92	0.60	0.180	(0.126)	0.032	0.148
144	12.00	0.60	0.180	(0.126)	0.032	0.148
145	12.08	0.83	0.250	(0.125)	0.045	0.205
146	12.17	0.83	0.250	(0.125)	0.045	0.205
147	12.25	0.83	0.250	(0.124)	0.045	0.205
148	12.33	0.87	0.260	(0.123)	0.047	0.213
149	12.42	0.87	0.260	(0.123)	0.047	0.213
150	12.50	0.87	0.260	(0.122)	0.047	0.213
151	12.58	0.93	0.280	(0.121)	0.050	0.230
152	12.67	0.93	0.280	(0.121)	0.050	0.230
153	12.75	0.93	0.280	(0.120)	0.050	0.230
154	12.83	0.97	0.290	(0.120)	0.052	0.238
155	12.92	0.97	0.290	(0.119)	0.052	0.238
156	13.00	0.97	0.290	(0.118)	0.052	0.238
157	13.08	1.13	0.340	(0.118)	0.061	0.279
158	13.17	1.13	0.340	(0.117)	0.061	0.279
159	13.25	1.13	0.340	(0.117)	0.061	0.279
160	13.33	1.13	0.340	(0.116)	0.061	0.279
161	13.42	1.13	0.340	(0.115)	0.061	0.279
162	13.50	1.13	0.340	(0.115)	0.061	0.279
163	13.58	0.77	0.230	(0.114)	0.041	0.189
164	13.67	0.77	0.230	(0.114)	0.041	0.189
165	13.75	0.77	0.230	(0.113)	0.041	0.189
166	13.83	0.77	0.230	(0.113)	0.041	0.189
167	13.92	0.77	0.230	(0.112)	0.041	0.189
168	14.00	0.77	0.230	(0.111)	0.041	0.189
169	14.08	0.90	0.270	(0.111)	0.049	0.221
170	14.17	0.90	0.270	(0.110)	0.049	0.221
171	14.25	0.90	0.270	(0.110)	0.049	0.221
172	14.33	0.87	0.260	(0.109)	0.047	0.213
173	14.42	0.87	0.260	(0.109)	0.047	0.213
174	14.50	0.87	0.260	(0.108)	0.047	0.213
175	14.58	0.87	0.260	(0.107)	0.047	0.213
176	14.67	0.87	0.260	(0.107)	0.047	0.213
177	14.75	0.87	0.260	(0.106)	0.047	0.213
178	14.83	0.83	0.250	(0.106)	0.045	0.205
179	14.92	0.83	0.250	(0.105)	0.045	0.205
180	15.00	0.83	0.250	(0.105)	0.045	0.205
181	15.08	0.80	0.240	(0.104)	0.043	0.197
182	15.17	0.80	0.240	(0.104)	0.043	0.197

183	15.25	0.80	0.240	(0.103)	0.043	0.197
184	15.33	0.77	0.230	(0.103)	0.041	0.189
185	15.42	0.77	0.230	(0.102)	0.041	0.189
186	15.50	0.77	0.230	(0.102)	0.041	0.189
187	15.58	0.63	0.190	(0.101)	0.034	0.156
188	15.67	0.63	0.190	(0.101)	0.034	0.156
189	15.75	0.63	0.190	(0.100)	0.034	0.156
190	15.83	0.63	0.190	(0.100)	0.034	0.156
191	15.92	0.63	0.190	(0.099)	0.034	0.156
192	16.00	0.63	0.190	(0.099)	0.034	0.156
193	16.08	0.13	0.040	(0.098)	0.007	0.033
194	16.17	0.13	0.040	(0.098)	0.007	0.033
195	16.25	0.13	0.040	(0.097)	0.007	0.033
196	16.33	0.13	0.040	(0.097)	0.007	0.033
197	16.42	0.13	0.040	(0.096)	0.007	0.033
198	16.50	0.13	0.040	(0.096)	0.007	0.033
199	16.58	0.10	0.030	(0.095)	0.005	0.025
200	16.67	0.10	0.030	(0.095)	0.005	0.025
201	16.75	0.10	0.030	(0.094)	0.005	0.025
202	16.83	0.10	0.030	(0.094)	0.005	0.025
203	16.92	0.10	0.030	(0.093)	0.005	0.025
204	17.00	0.10	0.030	(0.093)	0.005	0.025
205	17.08	0.17	0.050	(0.092)	0.009	0.041
206	17.17	0.17	0.050	(0.092)	0.009	0.041
207	17.25	0.17	0.050	(0.091)	0.009	0.041
208	17.33	0.17	0.050	(0.091)	0.009	0.041
209	17.42	0.17	0.050	(0.090)	0.009	0.041
210	17.50	0.17	0.050	(0.090)	0.009	0.041
211	17.58	0.17	0.050	(0.089)	0.009	0.041
212	17.67	0.17	0.050	(0.089)	0.009	0.041
213	17.75	0.17	0.050	(0.089)	0.009	0.041
214	17.83	0.13	0.040	(0.088)	0.007	0.033
215	17.92	0.13	0.040	(0.088)	0.007	0.033
216	18.00	0.13	0.040	(0.087)	0.007	0.033
217	18.08	0.13	0.040	(0.087)	0.007	0.033
218	18.17	0.13	0.040	(0.086)	0.007	0.033
219	18.25	0.13	0.040	(0.086)	0.007	0.033
220	18.33	0.13	0.040	(0.086)	0.007	0.033
221	18.42	0.13	0.040	(0.085)	0.007	0.033
222	18.50	0.13	0.040	(0.085)	0.007	0.033
223	18.58	0.10	0.030	(0.084)	0.005	0.025
224	18.67	0.10	0.030	(0.084)	0.005	0.025
225	18.75	0.10	0.030	(0.084)	0.005	0.025
226	18.83	0.07	0.020	(0.083)	0.004	0.016
227	18.92	0.07	0.020	(0.083)	0.004	0.016
228	19.00	0.07	0.020	(0.082)	0.004	0.016
229	19.08	0.10	0.030	(0.082)	0.005	0.025
230	19.17	0.10	0.030	(0.082)	0.005	0.025
231	19.25	0.10	0.030	(0.081)	0.005	0.025
232	19.33	0.13	0.040	(0.081)	0.007	0.033
233	19.42	0.13	0.040	(0.080)	0.007	0.033
234	19.50	0.13	0.040	(0.080)	0.007	0.033
235	19.58	0.10	0.030	(0.080)	0.005	0.025
236	19.67	0.10	0.030	(0.079)	0.005	0.025
237	19.75	0.10	0.030	(0.079)	0.005	0.025
238	19.83	0.07	0.020	(0.079)	0.004	0.016
239	19.92	0.07	0.020	(0.078)	0.004	0.016
240	20.00	0.07	0.020	(0.078)	0.004	0.016
241	20.08	0.10	0.030	(0.078)	0.005	0.025
242	20.17	0.10	0.030	(0.077)	0.005	0.025
243	20.25	0.10	0.030	(0.077)	0.005	0.025
244	20.33	0.10	0.030	(0.077)	0.005	0.025
245	20.42	0.10	0.030	(0.076)	0.005	0.025
246	20.50	0.10	0.030	(0.076)	0.005	0.025
247	20.58	0.10	0.030	(0.076)	0.005	0.025
248	20.67	0.10	0.030	(0.075)	0.005	0.025
249	20.75	0.10	0.030	(0.075)	0.005	0.025
250	20.83	0.07	0.020	(0.075)	0.004	0.016
251	20.92	0.07	0.020	(0.074)	0.004	0.016
252	21.00	0.07	0.020	(0.074)	0.004	0.016
253	21.08	0.10	0.030	(0.074)	0.005	0.025

```
254  21.17     0.10      0.030       (  0.073)       0.005        0.025
255  21.25     0.10      0.030       (  0.073)       0.005        0.025
256  21.33     0.07      0.020       (  0.073)       0.004        0.016
257  21.42     0.07      0.020       (  0.073)       0.004        0.016
258  21.50     0.07      0.020       (  0.072)       0.004        0.016
259  21.58     0.10      0.030       (  0.072)       0.005        0.025
260  21.67     0.10      0.030       (  0.072)       0.005        0.025
261  21.75     0.10      0.030       (  0.072)       0.005        0.025
262  21.83     0.07      0.020       (  0.071)       0.004        0.016
263  21.92     0.07      0.020       (  0.071)       0.004        0.016
264  22.00     0.07      0.020       (  0.071)       0.004        0.016
265  22.08     0.10      0.030       (  0.071)       0.005        0.025
266  22.17     0.10      0.030       (  0.070)       0.005        0.025
267  22.25     0.10      0.030       (  0.070)       0.005        0.025
268  22.33     0.07      0.020       (  0.070)       0.004        0.016
269  22.42     0.07      0.020       (  0.070)       0.004        0.016
270  22.50     0.07      0.020       (  0.069)       0.004        0.016
271  22.58     0.07      0.020       (  0.069)       0.004        0.016
272  22.67     0.07      0.020       (  0.069)       0.004        0.016
273  22.75     0.07      0.020       (  0.069)       0.004        0.016
274  22.83     0.07      0.020       (  0.069)       0.004        0.016
275  22.92     0.07      0.020       (  0.069)       0.004        0.016
276  23.00     0.07      0.020       (  0.068)       0.004        0.016
277  23.08     0.07      0.020       (  0.068)       0.004        0.016
278  23.17     0.07      0.020       (  0.068)       0.004        0.016
279  23.25     0.07      0.020       (  0.068)       0.004        0.016
280  23.33     0.07      0.020       (  0.068)       0.004        0.016
281  23.42     0.07      0.020       (  0.068)       0.004        0.016
282  23.50     0.07      0.020       (  0.068)       0.004        0.016
283  23.58     0.07      0.020       (  0.067)       0.004        0.016
284  23.67     0.07      0.020       (  0.067)       0.004        0.016
285  23.75     0.07      0.020       (  0.067)       0.004        0.016
286  23.83     0.07      0.020       (  0.067)       0.004        0.016
287  23.92     0.07      0.020       (  0.067)       0.004        0.016
288  24.00     0.07      0.020       (  0.067)       0.004        0.016
               (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    24.6
      Flood volume = Effective rainfall      2.05(In)
       times area       1.9(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
      Total soil loss =      0.45(In)
      Total soil loss =     0.070(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =       13915.6 Cubic Feet
      Total soil loss =        3054.6 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.526(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0001      0.02  Q         |         |         |         |
   0+10       0.0004      0.03  Q         |         |         |         |
   0+15       0.0006      0.03  Q         |         |         |         |
   0+20       0.0008      0.04  Q         |         |         |         |
   0+25       0.0012      0.05  Q         |         |         |         |
   0+30       0.0015      0.05  Q         |         |         |         |
   0+35       0.0018      0.05  Q         |         |         |         |
   0+40       0.0021      0.05  Q         |         |         |         |
   0+45       0.0024      0.05  Q         |         |         |         |
   0+50       0.0028      0.06  Q         |         |         |         |
   0+55       0.0033      0.06  Q         |         |         |         |
   1+ 0       0.0037      0.06  Q         |         |         |         |
   1+ 5       0.0040      0.05  Q         |         |         |         |
   1+10       0.0044      0.05  Q         |         |         |         |
   1+15       0.0047      0.05  Q         |         |         |         |
```

1+20	0.0050	0.05	Q	|	|	|	|
1+25	0.0053	0.05	Q	|	|	|	|
1+30	0.0056	0.05	Q	|	|	|	|
1+35	0.0060	0.05	Q	|	|	|	|
1+40	0.0063	0.05	Q	|	|	|	|
1+45	0.0066	0.05	Q	|	|	|	|
1+50	0.0070	0.06	Q	|	|	|	|
1+55	0.0074	0.06	Q	|	|	|	|
2+ 0	0.0078	0.06	Q	|	|	|	|
2+ 5	0.0083	0.06	QV	|	|	|	|
2+10	0.0087	0.06	QV	|	|	|	|
2+15	0.0091	0.06	QV	|	|	|	|
2+20	0.0095	0.06	QV	|	|	|	|
2+25	0.0100	0.06	QV	|	|	|	|
2+30	0.0104	0.06	QV	|	|	|	|
2+35	0.0109	0.07	QV	|	|	|	|
2+40	0.0114	0.08	QV	|	|	|	|
2+45	0.0120	0.08	QV	|	|	|	|
2+50	0.0125	0.08	QV	|	|	|	|
2+55	0.0130	0.08	QV	|	|	|	|
3+ 0	0.0136	0.08	QV	|	|	|	|
3+ 5	0.0141	0.08	QV	|	|	|	|
3+10	0.0146	0.08	QV	|	|	|	|
3+15	0.0152	0.08	QV	|	|	|	|
3+20	0.0157	0.08	QV	|	|	|	|
3+25	0.0162	0.08	Q V	|	|	|	|
3+30	0.0167	0.08	Q V	|	|	|	|
3+35	0.0173	0.08	Q V	|	|	|	|
3+40	0.0178	0.08	Q V	|	|	|	|
3+45	0.0183	0.08	Q V	|	|	|	|
3+50	0.0189	0.09	Q V	|	|	|	|
3+55	0.0196	0.09	Q V	|	|	|	|
4+ 0	0.0202	0.09	Q V	|	|	|	|
4+ 5	0.0209	0.09	Q V	|	|	|	|
4+10	0.0215	0.09	Q V	|	|	|	|
4+15	0.0221	0.09	Q V	|	|	|	|
4+20	0.0229	0.10	Q V	|	|	|	|
4+25	0.0236	0.11	Q V	|	|	|	|
4+30	0.0243	0.11	Q V	|	|	|	|
4+35	0.0251	0.11	Q V	|	|	|	|
4+40	0.0258	0.11	Q V	|	|	|	|
4+45	0.0266	0.11	Q V	|	|	|	|
4+50	0.0274	0.12	Q V	|	|	|	|
4+55	0.0282	0.12	Q V	|	|	|	|
5+ 0	0.0291	0.12	Q V	|	|	|	|
5+ 5	0.0298	0.10	Q V	|	|	|	|
5+10	0.0305	0.09	Q V	|	|	|	|
5+15	0.0311	0.09	Q V	|	|	|	|
5+20	0.0318	0.10	Q V	|	|	|	|
5+25	0.0325	0.11	Q V	|	|	|	|
5+30	0.0333	0.11	Q V	|	|	|	|
5+35	0.0341	0.12	Q V	|	|	|	|
5+40	0.0350	0.12	Q V	|	|	|	|
5+45	0.0358	0.12	Q V	|	|	|	|
5+50	0.0367	0.12	Q V	|	|	|	|
5+55	0.0375	0.12	Q V	|	|	|	|
6+ 0	0.0384	0.12	Q V	|	|	|	|
6+ 5	0.0393	0.13	Q V	|	|	|	|
6+10	0.0402	0.14	Q V	|	|	|	|
6+15	0.0412	0.14	Q V	|	|	|	|
6+20	0.0422	0.14	Q V	|	|	|	|
6+25	0.0431	0.14	Q V	|	|	|	|
6+30	0.0441	0.14	Q V	|	|	|	|
6+35	0.0451	0.15	Q V	|	|	|	|
6+40	0.0462	0.15	Q V	|	|	|	|
6+45	0.0472	0.15	Q V	|	|	|	|
6+50	0.0483	0.15	Q V	|	|	|	|
6+55	0.0494	0.15	Q V	|	|	|	|
7+ 0	0.0504	0.15	Q V	|	|	|	|
7+ 5	0.0515	0.15	Q V	|	|	|	|
7+10	0.0526	0.15	Q V	|	|	|	|

7+15	0.0536	0.15	Q	V	|	|	|
7+20	0.0548	0.16	Q	V	|	|	|
7+25	0.0559	0.17	Q	V	|	|	|
7+30	0.0571	0.17	Q	V	|	|	|
7+35	0.0583	0.18	Q	V	|	|	|
7+40	0.0596	0.19	Q	V	|	|	|
7+45	0.0609	0.19	Q	V	|	|	|
7+50	0.0622	0.20	Q	V	|	|	|
7+55	0.0636	0.20	Q	V	|	|	|
8+ 0	0.0650	0.20	Q	V	|	|	|
8+ 5	0.0665	0.22	Q	V	|	|	|
8+10	0.0681	0.23	Q	V	|	|	|
8+15	0.0697	0.23	Q	V	|	|	|
8+20	0.0713	0.23	Q	V	|	|	|
8+25	0.0729	0.23	Q	V	|	|	|
8+30	0.0745	0.23	Q	V	|	|	|
8+35	0.0762	0.24	Q	V	|	|	|
8+40	0.0779	0.25	Q	V	|	|	|
8+45	0.0796	0.25	Q	V	|	|	|
8+50	0.0814	0.26	|Q	V	|	|	|
8+55	0.0832	0.26	|Q	V	|	|	|
9+ 0	0.0850	0.26	|Q	V	|	|	|
9+ 5	0.0869	0.28	|Q	V	|	|	|
9+10	0.0890	0.29	|Q	|V	|	|	|
9+15	0.0910	0.29	|Q	|V	|	|	|
9+20	0.0931	0.30	|Q	|V	|	|	|
9+25	0.0952	0.31	|Q	|V	|	|	|
9+30	0.0973	0.31	|Q	| V	|	|	|
9+35	0.0995	0.32	|Q	| V	|	|	|
9+40	0.1018	0.32	|Q	| V	|	|	|
9+45	0.1040	0.32	|Q	| V	|	|	|
9+50	0.1063	0.33	|Q	| V	|	|	|
9+55	0.1087	0.34	|Q	| V	|	|	|
10+ 0	0.1110	0.34	|Q	| V	|	|	|
10+ 5	0.1129	0.27	|Q	| V	|	|	|
10+10	0.1145	0.23	Q	| V	|	|	|
10+15	0.1161	0.23	Q	| V	|	|	|
10+20	0.1177	0.23	Q	| V	|	|	|
10+25	0.1193	0.23	Q	| V	|	|	|
10+30	0.1208	0.23	Q	| V	|	|	|
10+35	0.1228	0.28	|Q	| V	|	|	|
10+40	0.1249	0.31	|Q	| V	|	|	|
10+45	0.1271	0.31	|Q	| V	|	|	|
10+50	0.1292	0.31	|Q	| V	|	|	|
10+55	0.1313	0.31	|Q	| V	|	|	|
11+ 0	0.1334	0.31	|Q	| V	|	|	|
11+ 5	0.1355	0.30	|Q	| V	|	|	|
11+10	0.1375	0.29	|Q	| V	|	|	|
11+15	0.1396	0.29	|Q	| V	|	|	|
11+20	0.1416	0.29	|Q	| V	|	|	|
11+25	0.1436	0.29	|Q	| V	|	|	|
11+30	0.1456	0.29	|Q	| V	|	|	|
11+35	0.1475	0.27	|Q	| V	|	|	|
11+40	0.1493	0.26	|Q	| V	|	|	|
11+45	0.1511	0.26	|Q	| V	|	|	|
11+50	0.1530	0.27	|Q	| V	|	|	|
11+55	0.1549	0.28	|Q	| V	|	|	|
12+ 0	0.1568	0.28	|Q	| V	|	|	|
12+ 5	0.1592	0.35	|Q	| V	|	|	|
12+10	0.1619	0.39	|Q	| V	|	|	|
12+15	0.1646	0.39	|Q	| V	|	|	|
12+20	0.1673	0.40	|Q	| V	|	|	|
12+25	0.1701	0.40	|Q	| |V	|	|	|
12+30	0.1728	0.40	|Q	| |V	|	|	|
12+35	0.1758	0.42	|Q	| | V	|	|	|
12+40	0.1787	0.43	|Q	| | V	|	|	|
12+45	0.1817	0.43	|Q	| | V	|	|	|
12+50	0.1848	0.44	|Q	| | V	|	|	|
12+55	0.1879	0.45	|Q	| | V	|	|	|
13+ 0	0.1909	0.45	|Q	| | V	|	|	|
13+ 5	0.1944	0.50	|Q	| | V	|	|	|

```
13+10       0.1980      0.53  | Q       |          |   V     |          |
13+15       0.2016      0.53  | Q       |          |    V    |          |
13+20       0.2052      0.53  | Q       |          |    V    |          |
13+25       0.2089      0.53  | Q       |          |     V   |          |
13+30       0.2125      0.53  | Q       |          |     V   |          |
13+35       0.2153      0.41  |Q        |          |     V   |          |
13+40       0.2178      0.36  |Q        |          |      V  |          |
13+45       0.2202      0.36  |Q        |          |      V  |          |
13+50       0.2227      0.36  |Q        |          |      V  |          |
13+55       0.2251      0.36  |Q        |          |       V |          |
14+ 0       0.2276      0.36  |Q        |          |       V |          |
14+ 5       0.2303      0.40  |Q        |          |       V |          |
14+10       0.2332      0.42  |Q        |          |        V|          |
14+15       0.2361      0.42  |Q        |          |        V|          |
14+20       0.2389      0.41  |Q        |          |        V|          |
14+25       0.2416      0.40  |Q        |          |         V          |
14+30       0.2444      0.40  |Q        |          |         V          |
14+35       0.2472      0.40  |Q        |          |         V          |
14+40       0.2499      0.40  |Q        |          |          |V        |
14+45       0.2527      0.40  |Q        |          |          |V        |
14+50       0.2554      0.39  |Q        |          |          |V        |
14+55       0.2581      0.39  |Q        |          |          | V       |
15+ 0       0.2607      0.39  |Q        |          |          | V       |
15+ 5       0.2633      0.38  |Q        |          |          | V       |
15+10       0.2659      0.37  |Q        |          |          |  V      |
15+15       0.2684      0.37  |Q        |          |          |  V      |
15+20       0.2709      0.36  |Q        |          |          |  V      |
15+25       0.2734      0.36  |Q        |          |          |   V     |
15+30       0.2758      0.36  |Q        |          |          |   V     |
15+35       0.2780      0.31  |Q        |          |          |   V     |
15+40       0.2800      0.29  |Q        |          |          |    V    |
15+45       0.2820      0.29  |Q        |          |          |    V    |
15+50       0.2841      0.29  |Q        |          |          |    V    |
15+55       0.2861      0.29  |Q        |          |          |    V    |
16+ 0       0.2881      0.29  |Q        |          |          |     V   |
16+ 5       0.2891      0.14  Q         |          |          |     V   |
16+10       0.2895      0.06  Q         |          |          |     V   |
16+15       0.2899      0.06  Q         |          |          |     V   |
16+20       0.2903      0.06  Q         |          |          |     V   |
16+25       0.2908      0.06  Q         |          |          |     V   |
16+30       0.2912      0.06  Q         |          |          |     V   |
16+35       0.2916      0.05  Q         |          |          |     V   |
16+40       0.2919      0.05  Q         |          |          |     V   |
16+45       0.2922      0.05  Q         |          |          |     V   |
16+50       0.2925      0.05  Q         |          |          |     V   |
16+55       0.2928      0.05  Q         |          |          |     V   |
17+ 0       0.2932      0.05  Q         |          |          |     V   |
17+ 5       0.2936      0.07  Q         |          |          |     V   |
17+10       0.2941      0.08  Q         |          |          |     V   |
17+15       0.2947      0.08  Q         |          |          |     V   |
17+20       0.2952      0.08  Q         |          |          |     V   |
17+25       0.2957      0.08  Q         |          |          |      V  |
17+30       0.2963      0.08  Q         |          |          |      V  |
17+35       0.2968      0.08  Q         |          |          |      V  |
17+40       0.2973      0.08  Q         |          |          |      V  |
17+45       0.2979      0.08  Q         |          |          |      V  |
17+50       0.2983      0.07  Q         |          |          |      V  |
17+55       0.2988      0.06  Q         |          |          |      V  |
18+ 0       0.2992      0.06  Q         |          |          |      V  |
18+ 5       0.2996      0.06  Q         |          |          |      V  |
18+10       0.3000      0.06  Q         |          |          |      V  |
18+15       0.3005      0.06  Q         |          |          |      V  |
18+20       0.3009      0.06  Q         |          |          |      V  |
18+25       0.3013      0.06  Q         |          |          |      V  |
18+30       0.3017      0.06  Q         |          |          |      V  |
18+35       0.3021      0.05  Q         |          |          |      V  |
18+40       0.3024      0.05  Q         |          |          |      V  |
18+45       0.3027      0.05  Q         |          |          |      V  |
18+50       0.3030      0.04  Q         |          |          |      V  |
18+55       0.3032      0.03  Q         |          |          |      V  |
19+ 0       0.3034      0.03  Q         |          |          |      V  |
```

19+ 5	0.3037	0.04	Q	|	|	|	V |
19+10	0.3040	0.05	Q	|	|	|	V |
19+15	0.3043	0.05	Q	|	|	|	V |
19+20	0.3047	0.06	Q	|	|	|	V |
19+25	0.3051	0.06	Q	|	|	|	V |
19+30	0.3056	0.06	Q	|	|	|	V |
19+35	0.3059	0.05	Q	|	|	|	V |
19+40	0.3063	0.05	Q	|	|	|	V |
19+45	0.3066	0.05	Q	|	|	|	V |
19+50	0.3068	0.04	Q	|	|	|	V |
19+55	0.3070	0.03	Q	|	|	|	V |
20+ 0	0.3072	0.03	Q	|	|	|	V |
20+ 5	0.3075	0.04	Q	|	|	|	V |
20+10	0.3078	0.05	Q	|	|	|	V |
20+15	0.3082	0.05	Q	|	|	|	V |
20+20	0.3085	0.05	Q	|	|	|	V |
20+25	0.3088	0.05	Q	|	|	|	V |
20+30	0.3091	0.05	Q	|	|	|	V |
20+35	0.3094	0.05	Q	|	|	|	V |
20+40	0.3098	0.05	Q	|	|	|	V |
20+45	0.3101	0.05	Q	|	|	|	V |
20+50	0.3103	0.04	Q	|	|	|	V |
20+55	0.3105	0.03	Q	|	|	|	V |
21+ 0	0.3108	0.03	Q	|	|	|	V |
21+ 5	0.3110	0.04	Q	|	|	|	V |
21+10	0.3114	0.05	Q	|	|	|	V |
21+15	0.3117	0.05	Q	|	|	|	V|
21+20	0.3119	0.04	Q	|	|	|	V|
21+25	0.3121	0.03	Q	|	|	|	V|
21+30	0.3124	0.03	Q	|	|	|	V|
21+35	0.3126	0.04	Q	|	|	|	V|
21+40	0.3130	0.05	Q	|	|	|	V|
21+45	0.3133	0.05	Q	|	|	|	V|
21+50	0.3135	0.04	Q	|	|	|	V|
21+55	0.3137	0.03	Q	|	|	|	V|
22+ 0	0.3140	0.03	Q	|	|	|	V|
22+ 5	0.3142	0.04	Q	|	|	|	V|
22+10	0.3146	0.05	Q	|	|	|	V|
22+15	0.3149	0.05	Q	|	|	|	V|
22+20	0.3151	0.04	Q	|	|	|	V|
22+25	0.3153	0.03	Q	|	|	|	V|
22+30	0.3156	0.03	Q	|	|	|	V|
22+35	0.3158	0.03	Q	|	|	|	V|
22+40	0.3160	0.03	Q	|	|	|	V|
22+45	0.3162	0.03	Q	|	|	|	V|
22+50	0.3164	0.03	Q	|	|	|	V|
22+55	0.3166	0.03	Q	|	|	|	V|
23+ 0	0.3168	0.03	Q	|	|	|	V|
23+ 5	0.3170	0.03	Q	|	|	|	V|
23+10	0.3173	0.03	Q	|	|	|	V|
23+15	0.3175	0.03	Q	|	|	|	V|
23+20	0.3177	0.03	Q	|	|	|	V|
23+25	0.3179	0.03	Q	|	|	|	V|
23+30	0.3181	0.03	Q	|	|	|	V|
23+35	0.3183	0.03	Q	|	|	|	V|
23+40	0.3185	0.03	Q	|	|	|	V|
23+45	0.3187	0.03	Q	|	|	|	V|
23+50	0.3190	0.03	Q	|	|	|	V|
23+55	0.3192	0.03	Q	|	|	|	V|
24+ 0	0.3194	0.03	Q	|	|	|	V|
24+ 5	0.3195	0.01	Q	|	|	|	V|

APPENDIX E: HYDRAULIC CALCULATIONS

APPENDIX E.1: GRATE INLET AND CURB INLET NORMAL DEPTH CALCULATIONS

Worksheet for Inlet #1A

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.02490	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		6.46	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		28.90	%
Intercepted Flow		1.87	ft³/s
Bypass Flow		4.59	ft³/s
Flow Area		1.95	ft²
Wetted Perimeter		19.98	ft
Top Width		19.98	ft
Velocity		3.31	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.04	
Grate Flow Ratio		0.26	
Active Grate Length		1.50	ft
Critical Depth		0.23	ft
Critical Slope		0.00654	ft/ft
Froude Number		1.87	
Flow Type	Supercritical		
Specific Energy		0.34	ft
Velocity Head		0.17	ft
Depth		0.17	ft

Worksheet for Inlet #1B

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.02490	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		4.59	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		32.18	%
Intercepted Flow		1.48	ft³/s
Bypass Flow		3.11	ft³/s
Flow Area		1.51	ft²
Wetted Perimeter		17.64	ft
Top Width		17.64	ft
Velocity		3.04	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.04	
Grate Flow Ratio		0.29	
Active Grate Length		1.50	ft
Critical Depth		0.19	ft
Critical Slope		0.00685	ft/ft
Froude Number		1.83	
Flow Type	Supercritical		
Specific Energy		0.29	ft
Velocity Head		0.14	ft
Depth		0.15	ft

Worksheet for Inlet #1C

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient	0.015	
Slope	0.02490	ft/ft
Left Side Slope	50.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Bottom Width	3.00	ft
Discharge	3.11	ft^3/s
Grate Width	3.00	ft
Grate Length	3.00	ft
Grate Type	P-50 mm (P-1-7/8")	
Clogging	50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency	36.21	%
Intercepted Flow	1.13	ft^3/s
Bypass Flow	1.98	ft^3/s
Flow Area	1.13	ft^2
Wetted Perimeter	15.35	ft
Top Width	15.35	ft
Velocity	2.74	ft/s
Splash Over Velocity	6.99	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.05	
Grate Flow Ratio	0.33	
Active Grate Length	1.50	ft
Critical Depth	0.16	ft
Critical Slope	0.00722	ft/ft
Froude Number	1.78	
Flow Type	Supercritical	
Specific Energy	0.24	ft
Velocity Head	0.12	ft
Depth	0.12	ft

Worksheet for Inlet #1D

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.02490	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		1.98	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		41.33	%
Intercepted Flow		0.82	ft³/s
Bypass Flow		1.16	ft³/s
Flow Area		0.81	ft²
Wetted Perimeter		13.06	ft
Top Width		13.05	ft
Velocity		2.45	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.06	
Grate Flow Ratio		0.37	
Active Grate Length		1.50	ft
Critical Depth		0.13	ft
Critical Slope		0.00768	ft/ft
Froude Number		1.74	
Flow Type	Supercritical		
Specific Energy		0.19	ft
Velocity Head		0.09	ft
Depth		0.10	ft

Worksheet for Inlet #1E

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.02490	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		1.16	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		47.83	%
Intercepted Flow		0.55	ft³/s
Bypass Flow		0.61	ft³/s
Flow Area		0.54	ft²
Wetted Perimeter		10.86	ft
Top Width		10.86	ft
Velocity		2.13	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.08	
Grate Flow Ratio		0.43	
Active Grate Length		1.50	ft
Critical Depth		0.10	ft
Critical Slope		0.00827	ft/ft
Froude Number		1.68	
Flow Type	Supercritical		
Specific Energy		0.15	ft
Velocity Head		0.07	ft
Depth		0.08	ft

Worksheet for Inlet #2A

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.00850	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		4.01	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		32.40	%
Intercepted Flow		1.30	ft³/s
Bypass Flow		2.71	ft³/s
Flow Area		2.04	ft²
Wetted Perimeter		20.43	ft
Top Width		20.42	ft
Velocity		1.97	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.09	
Grate Flow Ratio		0.26	
Active Grate Length		1.50	ft
Critical Depth		0.18	ft
Critical Slope		0.00698	ft/ft
Froude Number		1.10	
Flow Type	Supercritical		
Specific Energy		0.23	ft
Velocity Head		0.06	ft
Depth		0.17	ft

Worksheet for Inlet #2B

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.00850	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		2.71	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		36.59	%
Intercepted Flow		0.99	ft³/s
Bypass Flow		1.72	ft³/s
Flow Area		1.52	ft²
Wetted Perimeter		17.71	ft
Top Width		17.71	ft
Velocity		1.78	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.11	
Grate Flow Ratio		0.29	
Active Grate Length		1.50	ft
Critical Depth		0.15	ft
Critical Slope		0.00737	ft/ft
Froude Number		1.07	
Flow Type	Supercritical		
Specific Energy		0.20	ft
Velocity Head		0.05	ft
Depth		0.15	ft

Worksheet for Inlet #2C

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.00850	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		1.72	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		41.87	%
Intercepted Flow		0.72	ft³/s
Bypass Flow		1.00	ft³/s
Flow Area		1.09	ft²
Wetted Perimeter		15.05	ft
Top Width		15.05	ft
Velocity		1.58	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.13	
Grate Flow Ratio		0.33	
Active Grate Length		1.50	ft
Critical Depth		0.12	ft
Critical Slope		0.00784	ft/ft
Froude Number		1.04	
Flow Type	Supercritical		
Specific Energy		0.16	ft
Velocity Head		0.04	ft
Depth		0.12	ft

Worksheet for Inlet #2D

Project Description

Solve For	Efficiency

Input Data

Roughness Coefficient		0.015	
Slope		0.00850	ft/ft
Left Side Slope		50.00	ft/ft (H:V)
Right Side Slope		50.00	ft/ft (H:V)
Bottom Width		3.00	ft
Discharge		1.00	ft³/s
Grate Width		3.00	ft
Grate Length		3.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		48.68	%
Intercepted Flow		0.49	ft³/s
Bypass Flow		0.51	ft³/s
Flow Area		0.73	ft²
Wetted Perimeter		12.42	ft
Top Width		12.41	ft
Velocity		1.38	ft/s
Splash Over Velocity		6.99	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.16	
Grate Flow Ratio		0.39	
Active Grate Length		1.50	ft
Critical Depth		0.09	ft
Critical Slope		0.00850	ft/ft
Froude Number		1.00	
Flow Type	Critical		
Specific Energy		0.12	ft
Velocity Head		0.03	ft
Depth		0.09	ft

Worksheet for Inlet #3

Project Description

Solve For	Spread

Input Data

Discharge		1.98	ft^3/s
Gutter Width		2.00	ft
Gutter Cross Slope		0.07	ft/ft
Road Cross Slope		0.02	ft/ft
Curb Opening Length		3.00	ft
Opening Height		0.50	ft
Curb Throat Type	Horizontal		
Local Depression		4.00	in
Local Depression Width		4.00	ft
Throat Incline Angle		90.00	degrees

Results

Spread	9.62	ft
Depth	0.29	ft
Gutter Depression	0.09	ft
Total Depression	0.43	ft

Worksheet for Inlet #4

Project Description

Solve For	Spread

Input Data

Discharge		5.25	ft^3/s
Gutter Width		2.00	ft
Gutter Cross Slope		0.07	ft/ft
Road Cross Slope		0.02	ft/ft
Curb Opening Length		3.00	ft
Opening Height		0.50	ft
Curb Throat Type	Horizontal		
Local Depression		4.00	in
Local Depression Width		4.00	ft
Throat Incline Angle		90.00	degrees

Results

Spread	18.43	ft
Depth	0.46	ft
Gutter Depression	0.09	ft
Total Depression	0.43	ft

Worksheet for Inlet #5

Project Description

Solve For	Spread

Input Data

Discharge		5.81	ft^3/s
Gutter Width		2.00	ft
Gutter Cross Slope		0.07	ft/ft
Road Cross Slope		0.02	ft/ft
Curb Opening Length		3.00	ft
Opening Height		0.50	ft
Curb Throat Type	Horizontal		
Local Depression		4.00	in
Local Depression Width		4.00	ft
Throat Incline Angle		90.00	degrees

Results

Spread	19.72	ft
Depth	0.49	ft
Gutter Depression	0.09	ft
Total Depression	0.43	ft

APPENDIX E.2: LINE "A1" NORMAL DEPTH CALCULATION

Worksheet for Line A1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	1.50	ft
Discharge	5.85	ft^3/s

Results

Normal Depth	1.00	ft
Flow Area	1.26	ft^2
Wetted Perimeter	2.87	ft
Hydraulic Radius	0.44	ft
Top Width	1.41	ft
Critical Depth	0.93	ft
Percent Full	66.9	%
Critical Slope	0.00615	ft/ft
Velocity	4.66	ft/s
Velocity Head	0.34	ft
Specific Energy	1.34	ft
Froude Number	0.87	
Maximum Discharge	7.99	ft^3/s
Discharge Full	7.43	ft^3/s
Slope Full	0.00310	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	66.89	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line A1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.00	ft
Critical Depth	0.93	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00615	ft/ft

APPENDIX E.3: LINE "A2" NORMAL DEPTH CALCULATION

Worksheet for Line A2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	1.50	ft
Discharge	6.46	ft^3/s

Results

Normal Depth	1.08	ft
Flow Area	1.36	ft^2
Wetted Perimeter	3.04	ft
Hydraulic Radius	0.45	ft
Top Width	1.35	ft
Critical Depth	0.98	ft
Percent Full	72.1	%
Critical Slope	0.00646	ft/ft
Velocity	4.73	ft/s
Velocity Head	0.35	ft
Specific Energy	1.43	ft
Froude Number	0.83	
Maximum Discharge	7.99	ft^3/s
Discharge Full	7.43	ft^3/s
Slope Full	0.00378	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	72.12	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line A2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.08	ft
Critical Depth	0.98	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00646	ft/ft

APPENDIX E.4: LINE "B1" NORMAL DEPTH CALCULATION

Worksheet for Line B1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01140	ft/ft
Diameter	2.00	ft
Discharge	10.21	ft^3/s

Results

Normal Depth	0.91	ft
Flow Area	1.39	ft^2
Wetted Perimeter	2.96	ft
Hydraulic Radius	0.47	ft
Top Width	1.99	ft
Critical Depth	1.14	ft
Percent Full	45.4	%
Critical Slope	0.00523	ft/ft
Velocity	7.37	ft/s
Velocity Head	0.84	ft
Specific Energy	1.75	ft
Froude Number	1.56	
Maximum Discharge	25.98	ft^3/s
Discharge Full	24.15	ft^3/s
Slope Full	0.00204	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	45.38	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line B1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.91	ft
Critical Depth	1.14	ft
Channel Slope	0.01140	ft/ft
Critical Slope	0.00523	ft/ft

APPENDIX E.5: LINE "B2" NORMAL DEPTH CALCULATION

Worksheet for Line B2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01926	ft/ft
Diameter	1.50	ft
Discharge	3.50	ft³/s

Results

Normal Depth	0.50	ft
Flow Area	0.52	ft²
Wetted Perimeter	1.85	ft
Hydraulic Radius	0.28	ft
Top Width	1.41	ft
Critical Depth	0.71	ft
Percent Full	33.4	%
Critical Slope	0.00526	ft/ft
Velocity	6.78	ft/s
Velocity Head	0.71	ft
Specific Energy	1.21	ft
Froude Number	1.98	
Maximum Discharge	15.68	ft³/s
Discharge Full	14.58	ft³/s
Slope Full	0.00111	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	33.37	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line B2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.71	ft
Channel Slope	0.01926	ft/ft
Critical Slope	0.00526	ft/ft

APPENDIX E.6: LINE "B3" NORMAL DEPTH CALCULATION

Worksheet for Line B3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.05000	ft/ft
Diameter	1.50	ft
Discharge	5.20	ft³/s

Results

Normal Depth	0.48	ft
Flow Area	0.49	ft²
Wetted Perimeter	1.80	ft
Hydraulic Radius	0.27	ft
Top Width	1.40	ft
Critical Depth	0.88	ft
Percent Full	32.0	%
Critical Slope	0.00586	ft/ft
Velocity	10.68	ft/s
Velocity Head	1.77	ft
Specific Energy	2.25	ft
Froude Number	3.19	
Maximum Discharge	25.27	ft³/s
Discharge Full	23.49	ft³/s
Slope Full	0.00245	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	31.97	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line B3

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.48	ft
Critical Depth	0.88	ft
Channel Slope	0.05000	ft/ft
Critical Slope	0.00586	ft/ft

APPENDIX E.7: LINE "B4" NORMAL DEPTH CALCULATION

Worksheet for Line B4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.03330	ft/ft
Diameter	1.50	ft
Discharge	5.25	ft³/s

Results

Normal Depth	0.54	ft
Flow Area	0.57	ft²
Wetted Perimeter	1.92	ft
Hydraulic Radius	0.30	ft
Top Width	1.44	ft
Critical Depth	0.88	ft
Percent Full	35.8	%
Critical Slope	0.00588	ft/ft
Velocity	9.25	ft/s
Velocity Head	1.33	ft
Specific Energy	1.87	ft
Froude Number	2.59	
Maximum Discharge	20.62	ft³/s
Discharge Full	19.17	ft³/s
Slope Full	0.00250	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	35.77	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line B4

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.54	ft
Critical Depth	0.88	ft
Channel Slope	0.03330	ft/ft
Critical Slope	0.00588	ft/ft

APPENDIX E.8: LINE "C1" NORMAL DEPTH CALCULATION

Worksheet for Line C1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.09900	ft/ft
Diameter	1.50	ft
Discharge	5.81	ft^3/s

Results

Normal Depth	0.43	ft
Flow Area	0.41	ft^2
Wetted Perimeter	1.68	ft
Hydraulic Radius	0.24	ft
Top Width	1.35	ft
Critical Depth	0.93	ft
Percent Full	28.4	%
Critical Slope	0.00613	ft/ft
Velocity	14.09	ft/s
Velocity Head	3.08	ft
Specific Energy	3.51	ft
Froude Number	4.50	
Maximum Discharge	35.55	ft^3/s
Discharge Full	33.05	ft^3/s
Slope Full	0.00306	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	28.37	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line C1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.43	ft
Critical Depth	0.93	ft
Channel Slope	0.09900	ft/ft
Critical Slope	0.00613	ft/ft

APPENDIX E.9: LINE "C2" NORMAL DEPTH CALCULATION

Worksheet for Line C2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00300	ft/ft
Diameter	1.50	ft
Discharge	5.81	ft^3/s

Results

Normal Depth	1.24	ft
Flow Area	1.57	ft^2
Wetted Perimeter	3.43	ft
Hydraulic Radius	0.46	ft
Top Width	1.13	ft
Critical Depth	0.93	ft
Percent Full	82.9	%
Critical Slope	0.00613	ft/ft
Velocity	3.71	ft/s
Velocity Head	0.21	ft
Specific Energy	1.46	ft
Froude Number	0.56	
Maximum Discharge	6.19	ft^3/s
Discharge Full	5.75	ft^3/s
Slope Full	0.00306	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	82.89	%
Downstream Velocity	Infinity	ft/s

Worksheet for Line C2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.24	ft
Critical Depth	0.93	ft
Channel Slope	0.00300	ft/ft
Critical Slope	0.00613	ft/ft

APPENDIX E.10: LINE "1" FRICTION SLOPE CALCULATIONS

SADDLEBACK INDUSTRIAL LINE 1

PIPE SIZING (SOFFIT CONTROL)

DS WSE	SYSTEM	RCB HEIGHT	RCB WIDTH	AREA	NO.RCB	WETTED PERIMETER	PIPE LENGTH	Q (cfs)	K	PIPE SLOPE	DS INVERT	US INVERT	FRICTION SLOPE	VELOCITY	VELOCITY HEAD	LOSS COEFFICIENT	LOSSES	US WSE
1256.90	MERR SD	3.5	6	21	2	19	98.19	549.0	5132.20	0.0030	1256.90	1257.19	0.01144295	13.0714	2.6531	1.1000	2.9185	1260.94
1260.94	MERR SD	3.5	6	21	2	19	266.93	440.2	5132.20	0.0030	1257.19	1258.00	0.00735520	10.4798	1.7054	1.1000	1.8759	1264.78
1264.78	MERR SD	5	8	40	1	26	25.72	440.2	6093.49	0.0030	1258.00	1258.07	0.00521758	11.0038	1.8802	1.5000	2.8202	1267.74
1264.78	MERR LAT	5	8	40	1	26	489.45	440.2	6093.49	0.0121	1258.07	1263.99	0.00521758	11.0038	1.8802	1.5000	2.8202	1270.16

LOSSES

TRANSITION STRUCTURE		0.25
WALL ENTRANCE		0.25
JUNCTION STRUCTURE		0.25
		1.75

APPENDIX F: WATER QUALITY

APPENDIX F.1: 85TH PERCENTILE RAINFALL MAP

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

0.85 MiraLoma
0.61 RiversideNorth
0.68 PigeonPass
0.54 RiversideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.90 HurkeyCreek
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Santa Ana River Watershed
Santa Margarita Watershed

EASTVALE | JURUPA VALLEY | CORONA | NORCO | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | CANYON LAKE | LAKE ELSINORE | WILDOMAR | MENIFEE | MURRIETA | HEMET | TEMECULA

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

N

Rain Gage Locations

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011

APPENDIX F.2: SANTA ANA WATERSHED BMP DESIGN FLOW RATE SPREADSHEETS

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: JLC Engineering and Consulting, Inc. | Date: 3/29/2021

Designed by: Jilleen Ferris | Case No:

Company Project Number/Name: Saddleback Industrial - 292.01.20

BMP Identification

BMP NAME / ID: Modular Wetlands A

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
A-1	*85072.68*	*Concrete or Asphalt*	*1*	*0.89*	*75884.8*			
A-2	*9452.52*	*Ornamental Landscaping*	*0.1*	*0.11046*	*1044.1*			

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: JLC Engineering and Consulting, Inc. | Date: 3/29/2021

Designed by: Jilleen Ferris | Case No:

Company Project Number/Name: Saddleback Industrial - 292.01.20

BMP Identification

BMP NAME / ID: Modular Wetlands B1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
B1-1	*63118.44*	*Concrete or Asphalt*	*1*	*0.89*	*56301.6*			
B1-2	*7013.16*	*Ornamental Landscaping*	*0.1*	*0.11046*	*774.7*			

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	JLC Engineering and Consulting, Inc.	Date	3/29/2021
Designed by	Jilleen Ferris	Case No	
Company Project Number/Name	Saddleback Industrial - 292.01.20		

BMP Identification

BMP NAME / ID: Modular Wetlands B2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
B2-1	*62726.4*	*Concrete or Asphalt*	*1*	*0.89*	*55951.9*			
B2-2	*6969.6*	*Ornamental Landscaping*	*0.1*	*0.11046*	*769.8*			

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	JLC Engineering and Consulting, Inc.	Date	3/29/2021
Designed by	Jilleen Ferris	Case No	
Company Project Number/Name	Saddleback Industrial - 292.01.20		

BMP Identification

BMP NAME / ID: Modular Wetlands C

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

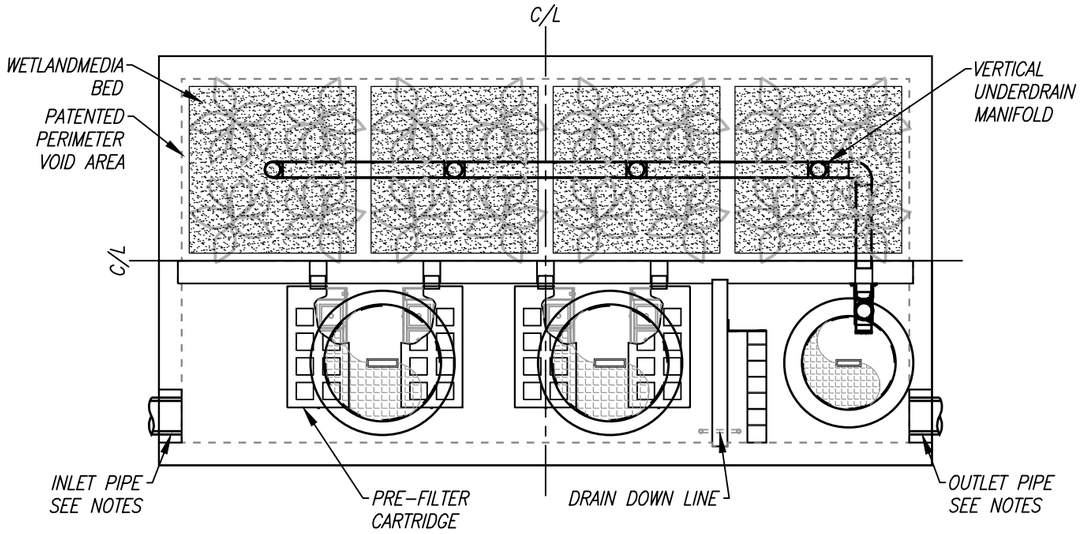
DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
C-1	*73311.48*	*Concrete or Asphalt*	*1*	*0.89*	*65393.8*			
C-2	*8145.72*	*Ornamental Landscaping*	*0.1*	*0.11046*	*899.8*			

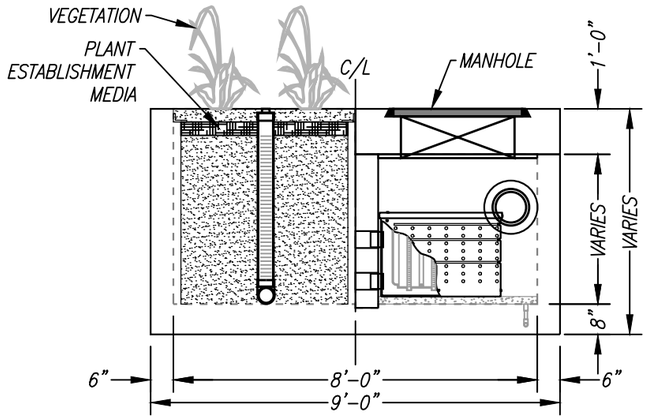
APPENDIX F.3: MODULAR WETLANDS REFERENCE MATERIAL

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.577	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	2EA ø30"	OPEN PLANTER	ø24"
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



PLAN VIEW



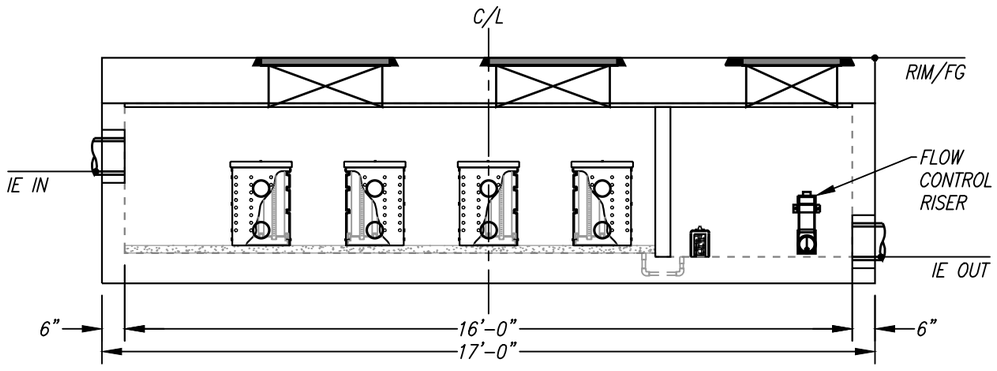
LEFT END VIEW

INSTALLATION NOTES

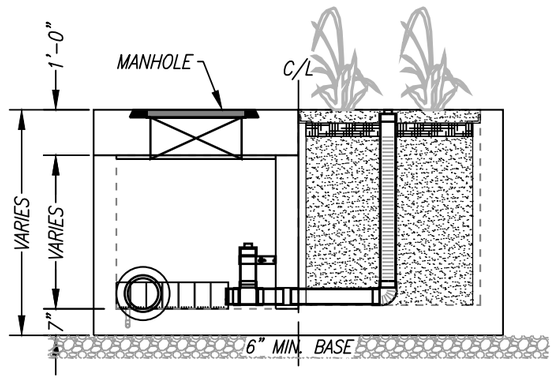
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



ELEVATION VIEW



RIGHT END VIEW

TREATMENT FLOW (CFS)	0.577
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

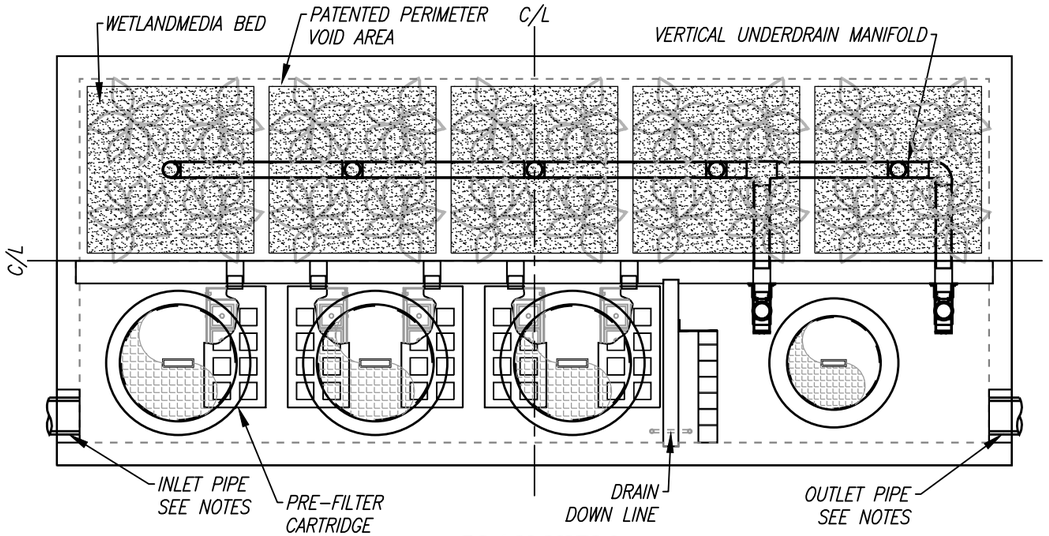
Bio Clean
A Forterra Company

MWS-L-8-16-V
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

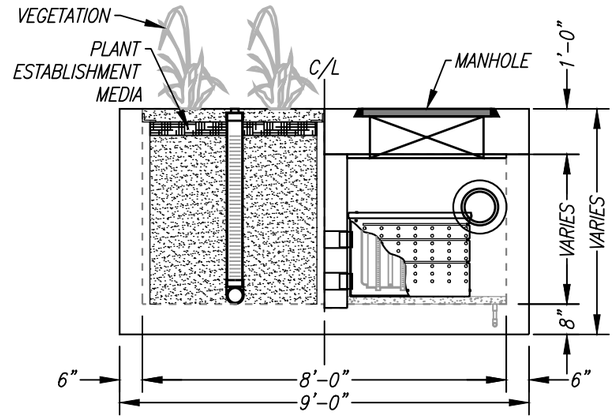
5/23/19 10:LEF

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.577	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	3EA ø30"	OPEN PLANTER	ø24"
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



PLAN VIEW



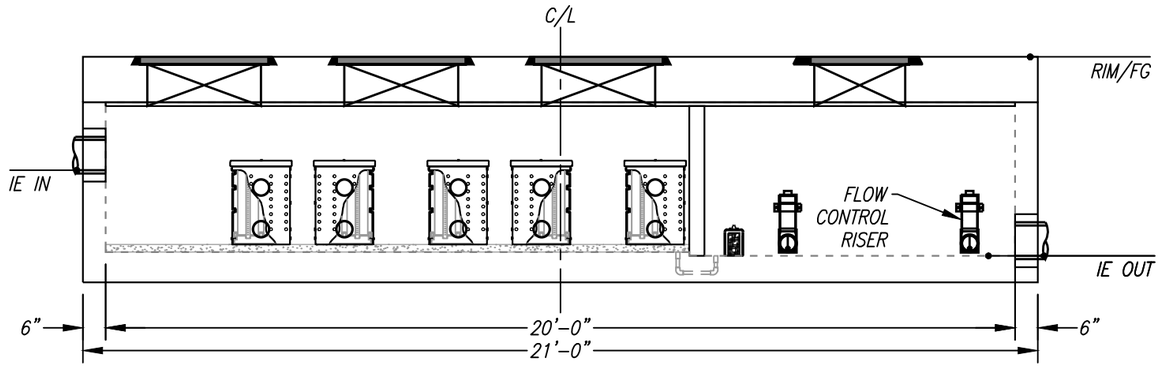
LEFT END VIEW

INSTALLATION NOTES

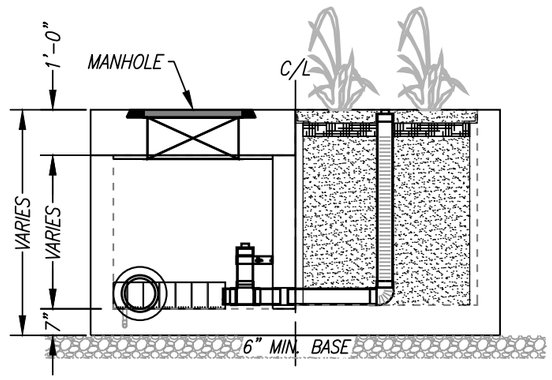
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



ELEVATION VIEW



RIGHT END VIEW

TREATMENT FLOW (CFS)	0.577
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

Bio Clean
A Forterra Company

MWS-L-8-20-V
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

5/23/19 10:LEF

APPENDIX G: SUBSURFACE BASIN VOLUME CALCULATIONS

APPENDIX G.1: SUBSURFACE BASIN "A"

Chamber Model	HS75	
Number of Chambers	25	
Number of Endcaps	10	
Stone Voids (porosity)	40%	
Base of Stone Elevation	0	ft
Recommended Stone Below Chambers*	9	in.
Recommended Stone Above Chambers*	12	in.

Include perimeter stone? Yes

Area of System** 8690 sq.ft

***Area must be greater than:* **986 sq.ft**

*The minimum stone below and above the chambers to be determinded by the design engineer.

System Height (in)	Incremental Single Chamber Storage (cu.ft)	Incremental Single End Cap Storage (cu.ft)	Incremental Total Chamber Storage (cu.ft)	Incremental Total End Cap Storage (cu.ft)	Incremental Stone Storage (cu.ft)	Incremental Chamber, End Cap, & Stone (cu.ft)	Cumulative System Storage (cu.ft)	Elevation (ft)
51	0.000	0.000	0.000	0.000	289.67	289.67	15484.87	4.25
50	0.000	0.000	0.000	0.000	289.67	289.67	15195.20	4.17
49	0.000	0.000	0.000	0.000	289.67	289.67	14905.54	4.08
48	0.000	0.000	0.000	0.000	289.67	289.67	14615.87	4.00
47	0.000	0.000	0.000	0.000	289.67	289.67	14326.20	3.92
46	0.000	0.000	0.000	0.000	289.67	289.67	14036.54	3.83
45	0.000	0.000	0.000	0.000	289.67	289.67	13746.87	3.75
44	0.000	0.000	0.000	0.000	289.67	289.67	13457.20	3.67
43	0.000	0.000	0.000	0.000	289.67	289.67	13167.54	3.58
42	0.000	0.000	0.000	0.000	289.67	289.67	12877.87	3.50
41	0.000	0.000	0.000	0.000	289.67	289.67	12588.20	3.42
40	0.000	0.000	0.000	0.000	289.67	289.67	12298.54	3.33
39	0.125	0.000	3.124	0.000	288.42	291.54	12008.87	3.25
38	0.301	0.010	7.517	0.100	286.62	294.24	11717.33	3.17
37	0.616	0.020	15.409	0.200	283.42	299.03	11423.09	3.08
36	0.852	0.030	21.291	0.300	281.03	302.62	11124.06	3.00
35	1.012	0.040	25.289	0.400	279.39	305.08	10821.44	2.92
34	1.138	0.050	28.459	0.500	278.08	307.04	10516.36	2.83
33	1.244	0.060	31.092	0.600	276.99	308.68	10209.32	2.75
32	1.333	0.060	33.326	0.600	276.10	310.02	9900.63	2.67
31	1.411	0.070	35.269	0.700	275.28	311.25	9590.61	2.58
30	1.481	0.080	37.030	0.800	274.53	312.36	9279.36	2.50
29	1.547	0.080	38.672	0.800	273.88	313.35	8967.00	2.42
28	1.608	0.090	40.204	0.900	273.23	314.33	8653.65	2.33
27	1.665	0.100	41.633	1.000	272.61	315.25	8339.32	2.25
26	1.719	0.100	42.964	1.000	272.08	316.05	8024.07	2.17
25	1.768	0.110	44.204	1.100	271.55	316.85	7708.03	2.08
24	1.814	0.110	45.356	1.100	271.08	317.54	7391.18	2.00
23	1.855	0.120	46.366	1.200	270.64	318.21	7073.64	1.92
22	1.897	0.120	47.428	1.200	270.22	318.84	6755.43	1.83
21	1.935	0.120	48.372	1.200	269.84	319.41	6436.59	1.75
20	1.970	0.130	49.259	1.300	269.44	320.00	6117.18	1.67
19	2.004	0.130	50.088	1.300	269.11	320.50	5797.18	1.58
18	2.034	0.130	50.862	1.300	268.80	320.96	5476.68	1.50
17	2.064	0.140	51.599	1.400	268.47	321.47	5155.71	1.42
16	2.093	0.140	52.314	1.400	268.18	321.90	4834.25	1.33
15	2.121	0.140	53.029	1.400	267.90	322.32	4512.35	1.25
14	2.149	0.140	53.725	1.400	267.62	322.74	4190.03	1.17
13	2.175	0.140	54.386	1.400	267.35	323.14	3867.29	1.08
12	2.201	0.140	55.028	1.400	267.10	323.52	3544.15	1.00
11	2.226	0.150	55.654	1.500	266.81	323.96	3220.63	0.92
10	0.000	0.000	0.000	0.000	289.67	289.67	2896.67	0.83
9	0.000	0.000	0.000	0.000	289.67	289.67	2607.00	0.75
8	0.000	0.000	0.000	0.000	289.67	289.67	2317.33	0.67
7	0.000	0.000	0.000	0.000	289.67	289.67	2027.67	0.58
6	0.000	0.000	0.000	0.000	289.67	289.67	1738.00	0.50
5	0.000	0.000	0.000	0.000	289.67	289.67	1448.33	0.42
4	0.000	0.000	0.000	0.000	289.67	289.67	1158.67	0.33
3	0.000	0.000	0.000	0.000	289.67	289.67	869.00	0.25
2	0.000	0.000	0.000	0.000	289.67	289.67	579.33	0.17
1	0.000	0.000	0.000	0.000	289.67	289.67	289.67	0.08
0	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00

APPENDIX G.2: SUBSURFACE BASIN "B"

Chamber Model	HS31		
Number of Chambers	25		
Number of Endcaps	10		
Stone Voids (porosity)	40%		
Base of Stone Elevation	0	ft	
Recommended Stone Below Chambers*	9	in.	**Include perimeter stone?** Yes
Recommended Stone Above Chambers*	12	in.	

Area of System** 18549 sq.ft

***Area must be greater than:* **700 sq.ft**

*The minimum stone below and above the chambers to be determinded by the design engineer.

System Height (in)	Incremental Single Chamber Storage (cu.ft)	Incremental Single End Cap Storage (cu.ft)	Incremental Total Chamber Storage (cu.ft)	Incremental Total End Cap Storage (cu.ft)	Incremental Stone Storage (cu.ft)	Incremental Chamber, End Cap, & Stone (cu.ft)	Cumulative System Storage (cu.ft)	Elevation (ft)
37	0.000	0.000	0.000	0.000	618.30	618.30	23104.51	3.08
36	0.000	0.000	0.000	0.000	618.30	618.30	22486.21	3.00
35	0.000	0.000	0.000	0.000	618.30	618.30	21867.91	2.92
34	0.000	0.000	0.000	0.000	618.30	618.30	21249.61	2.83
33	0.000	0.000	0.000	0.000	618.30	618.30	20631.31	2.75
32	0.000	0.000	0.000	0.000	618.30	618.30	20013.01	2.67
31	0.000	0.000	0.000	0.000	618.30	618.30	19394.71	2.58
30	0.000	0.000	0.000	0.000	618.30	618.30	18776.41	2.50
29	0.000	0.000	0.000	0.000	618.30	618.30	18158.11	2.42
28	0.000	0.000	0.000	0.000	618.30	618.30	17539.81	2.33
27	0.000	0.000	0.000	0.000	618.30	618.30	16921.51	2.25
26	0.000	0.000	0.000	0.000	618.30	618.30	16303.21	2.17
25	0.057	0.002	1.435	0.017	617.72	619.17	15684.91	2.08
24	0.207	0.006	5.170	0.060	616.21	621.44	15065.74	2.00
23	0.372	0.012	9.290	0.124	614.53	623.95	14444.30	1.92
22	0.622	0.017	15.560	0.173	612.01	627.74	13820.35	1.83
21	0.773	0.022	19.330	0.215	610.48	630.03	13192.61	1.75
20	0.887	0.025	22.178	0.251	609.33	631.76	12562.58	1.67
19	0.978	0.028	24.440	0.284	608.41	633.13	11930.83	1.58
18	1.053	0.031	26.333	0.313	607.64	634.29	11297.69	1.50
17	1.115	0.034	27.878	0.340	607.01	635.23	10663.40	1.42
16	1.164	0.036	29.095	0.364	606.52	635.98	10028.17	1.33
15	1.205	0.039	30.128	0.386	606.09	636.61	9392.20	1.25
14	1.241	0.041	31.018	0.407	605.73	637.15	8755.59	1.17
13	1.276	0.043	31.893	0.426	605.37	637.69	8118.44	1.08
12	1.309	0.044	32.728	0.444	605.03	638.20	7480.74	1.00
11	1.342	0.046	33.555	0.463	604.69	638.71	6842.54	0.92
10	1.372	0.042	34.295	0.423	604.41	639.13	6203.83	0.83
9	0.000	0.000	0.000	0.000	618.30	618.30	5564.70	0.75
8	0.000	0.000	0.000	0.000	618.30	618.30	4946.40	0.67
7	0.000	0.000	0.000	0.000	618.30	618.30	4328.10	0.58
6	0.000	0.000	0.000	0.000	618.30	618.30	3709.80	0.50
5	0.000	0.000	0.000	0.000	618.30	618.30	3091.50	0.42
4	0.000	0.000	0.000	0.000	618.30	618.30	2473.20	0.33
3	0.000	0.000	0.000	0.000	618.30	618.30	1854.90	0.25
2	0.000	0.000	0.000	0.000	618.30	618.30	1236.60	0.17
1	0.000	0.000	0.000	0.000	618.30	618.30	618.30	0.08
0	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00

APPENDIX G.3: SUBSURFACE BASIN "C"

Chamber Model	HS31		
Number of Chambers	25		
Number of Endcaps	10		
Stone Voids (porosity)	40%		
Base of Stone Elevation	0	ft	
Recommended Stone Below Chambers*	9	in.	**Include perimeter stone?** Yes
Recommended Stone Above Chambers*	12	in.	

Area of System** **10652** sq.ft

***Area must be greater than:* **700 sq.ft**

*The minimum stone below and above the chambers to be determinded by the design engineer.

System Height (in)	Incremental Single Chamber Storage (cu.ft)	Incremental Single End Cap Storage (cu.ft)	Incremental Total Chamber Storage (cu.ft)	Incremental Total End Cap Storage (cu.ft)	Incremental Stone Storage (cu.ft)	Incremental Chamber, End Cap, & Stone (cu.ft)	Cumulative System Storage (cu.ft)	Elevation (ft)
37	0.000	0.000	0.000	0.000	355.07	355.07	13364.87	3.08
36	0.000	0.000	0.000	0.000	355.07	355.07	13009.81	3.00
35	0.000	0.000	0.000	0.000	355.07	355.07	12654.74	2.92
34	0.000	0.000	0.000	0.000	355.07	355.07	12299.67	2.83
33	0.000	0.000	0.000	0.000	355.07	355.07	11944.61	2.75
32	0.000	0.000	0.000	0.000	355.07	355.07	11589.54	2.67
31	0.000	0.000	0.000	0.000	355.07	355.07	11234.47	2.58
30	0.000	0.000	0.000	0.000	355.07	355.07	10879.41	2.50
29	0.000	0.000	0.000	0.000	355.07	355.07	10524.34	2.42
28	0.000	0.000	0.000	0.000	355.07	355.07	10169.27	2.33
27	0.000	0.000	0.000	0.000	355.07	355.07	9814.21	2.25
26	0.000	0.000	0.000	0.000	355.07	355.07	9459.14	2.17
25	0.057	0.002	1.435	0.017	354.49	355.94	9104.07	2.08
24	0.207	0.006	5.170	0.060	352.97	358.20	8748.14	2.00
23	0.372	0.012	9.290	0.124	351.30	360.72	8389.93	1.92
22	0.622	0.017	15.560	0.173	348.77	364.51	8029.22	1.83
21	0.773	0.022	19.330	0.215	347.25	366.79	7664.71	1.75
20	0.887	0.025	22.178	0.251	346.10	368.52	7297.92	1.67
19	0.978	0.028	24.440	0.284	345.18	369.90	6929.39	1.58
18	1.053	0.031	26.333	0.313	344.41	371.05	6559.49	1.50
17	1.115	0.034	27.878	0.340	343.78	372.00	6188.44	1.42
16	1.164	0.036	29.095	0.364	343.28	372.74	5816.44	1.33
15	1.205	0.039	30.128	0.386	342.86	373.37	5443.70	1.25
14	1.241	0.041	31.018	0.407	342.50	373.92	5070.32	1.17
13	1.276	0.043	31.893	0.426	342.14	374.46	4696.40	1.08
12	1.309	0.044	32.728	0.444	341.80	374.97	4321.94	1.00
11	1.342	0.046	33.555	0.463	341.46	375.48	3946.97	0.92
10	1.372	0.042	34.295	0.423	341.18	375.90	3571.50	0.83
9	0.000	0.000	0.000	0.000	355.07	355.07	3195.60	0.75
8	0.000	0.000	0.000	0.000	355.07	355.07	2840.53	0.67
7	0.000	0.000	0.000	0.000	355.07	355.07	2485.47	0.58
6	0.000	0.000	0.000	0.000	355.07	355.07	2130.40	0.50
5	0.000	0.000	0.000	0.000	355.07	355.07	1775.33	0.42
4	0.000	0.000	0.000	0.000	355.07	355.07	1420.27	0.33
3	0.000	0.000	0.000	0.000	355.07	355.07	1065.20	0.25
2	0.000	0.000	0.000	0.000	355.07	355.07	710.13	0.17
1	0.000	0.000	0.000	0.000	355.07	355.07	355.07	0.08
0	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00

EXCERPTS

EXCERPT A: STREET IMPROVEMENT PLANS FOR COLLIER AVENUE

DRAWING NUMBER 91-378

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 017041

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 017041

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 017041

CITY OF LAKE ELSINORE

RIVERSIDE COUNTY, CALIFORNIA

STREET IMPROVEMENT PLANS

FOR

COLLIER AVENUE

GRADING NOTES

GENERAL GRADING NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAKE ELSINORE STANDARDS AND SPECIFICATIONS AND THE 1979 U.B.C. CHAPTER 70, UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES 48 HOURS PRIOR TO GRADING.
3. DUST SHALL BE CONTROLLED BY WATERING.
4. CUT SLOPES SHALL BE NO STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL UNLESS OTHERWISE SHOWN ON THE PLAN.
5. FILL SLOPES SHALL BE NO STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL UNLESS OTHERWISE SHOWN ON PLAN, AND SHALL NOT HAVE LESS THAN 90% REL. COMPACTION OUT TO THE FINISHED SURFACE.
6. FILLS SHALL BE COMPACTED THROUGHOUT TO 90% DENSITY AS DETERMINED BY THE MODIFIED THREE LAYER A.S.T.M. D-1557-70 TEST METHOD.
7. FILL AREAS SHALL BE CLEANED OF ALL VEGETATION AND DEBRIS, SCARIFIED AND INSPECTED BY THE GRADING INSPECTOR AND APPROVED SOILS TESTING AGENCY PRIOR TO THE PLACING OF FILL.
8. ALL FILL MATERIAL SHALL BE CLEAN EARTH. NO FILL SHALL BE PLACED UNTIL PREPARATION OF GROUND IS APPROVED BY SOILS ENGINEER.
9. THE SOILS ENGINEER WILL BE RETAINED TO INSPECT AND APPROVE AND PROVIDE A FINAL SOILS REPORT WHICH INCLUDES THE EXPANSIVE CHARACTERISTICS OF THE SOIL.
10. THE CONTRACTOR SHALL COMPLY WITH THE RECOMMENDATIONS OF THE SOILS ENGINEERING INVESTIGATION DATED APRIL 9, 1990, PREPARED BY LEIGHTON AND ASSOC.
11. THE SOIL ENGINEER WILL INSPECT THE CONSTRUCTION IN THE FOLLOWING STAGES:
    - A. UPON COMPLETION OF CLEARING AND DURING EXCAVATION AND BEFORE BACKFILL OF ALLUVIAL, COLLUVIAL AND TERRACED AREAS AND ANY SUBSTRUCTURES.
    - B. DURING ALL ROUGH GRADING AND OPERATIONS INCLUDING PRECOMPACTION BENCHING AND FILLING OPERATIONS.
    - C. DURING INSTALLATION OF BUTTRESS AND CANYON SUB-DRAINS AND FILTER MATERIAL.
    - D. WHEN ANY UNUSUAL GRADING CONDITIONS ARE ENCOUNTERED DURING CONSTRUCTION.
12. APPROVED PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS MUST BE USED TO PROTECT ADJOINING PROPERTIES DURING THE GRADING PROJECT.
13. APPROVED EROSION PREVENTATIVE DEVICES SHALL BE PROVIDED AND MAINTAINED DURING THE RAINY SEASON AND SHALL BE IN PLACE AT THE END OF EACH DAY'S WORK.
14. ALL WORK SHALL CONFORM TO THE CITY AND STATE CONSTRUCTION SAFETY ORDERS.
15. THE LOCATION AND PROTECTION OF ALL UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
16. AN APPROVED SET OF PLANS SHALL BE ON THE JOB SITE AT ALL TIMES.
17. SANITARY FACILITIES SHALL BE MAINTAINED ON THE SITE FROM BEGINNING TO COMPLETION OF GRADING OPERATION.
18. ALL SLOPES SHALL BE PLANTED AND IRRIGATION FACILITIES SHALL BE PROVIDED FOR ALL SLOPES IN EXCESS OF 5 FEET VERTICAL HEIGHT WITHIN 90 DAYS AFTER COMPLETION OF ROUGH GRADING.
    NOTE: PLANTED SLOPES SHALL BE WATERED AND MAINTAINED UNTIL A COVER SATISFACTORY TO THE CITY IS ESTABLISHED.
19. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF WITH THE SITE AND BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS OPERATIONS, WHETHER OR NOT SUCH FACILITIES ARE SHOWN ON THESE PLANS.
20. NO ROCK OR OTHER IRREDUCIBLE MATERIAL WITH A MAXIMUM DIMENSION GREATER THAN 12" SHALL BE PLACED IN FILLS. UNLESS THE LOCATION, MATERIALS, AND DISPOSAL METHODS ARE SPECIFICALLY APPROVED BY THE SOILS ENGINEER.
21. ENGINEER MUST SET GRADE STAKES FOR ALL DRAINAGE DEVICES AND OBTAIN INSPECTION BEFORE APPROVAL.
22. THE WEDGE AREA BETWEEN THE EXISTING SLOPE AND FINISHED STREET GRADE ALONG THE NORTHEAST RIGHT-OF-WAY FROM STA. 9+90 TO STA. 12+90 SHALL BE FILLED IN AND GRADED TO DRAIN TO THE STREET.

William H. Bagham 3/11/91
APPROVED BY
CITY OF LAKE ELSINORE
FOR CALTRANS ENCROACHMENT
PERMIT ONLY

GENERAL NOTES

1. NOTE TO CONTRACTORS: THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. APPROVAL OF THESE PLANS BY THE CITY OF LAKE ELSINORE DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OR COMPLETENESS OF THE LOCATION, NOR THE EXISTENCE OR NON- EXISTENCE OF ANY UNDERGROUND UTILITY, PIPE OR STRUCTURES WITHIN THE LIMITS OF THE PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL DUE PRECAUTIONARY MEASURES FOR THE PROTECTION OF ALL UTILITIES, PIPES OR STRUCTURES, WHETHER SHOWN ON THESE PLANS OR NOT. ANY UTILITY DAMAGED DURING THE PERFORMANCE OF THE WORK SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE GOVERNING AGENCY BY THE CONTRACTOR AT HIS EXPENSE.
2. ALL WORK SHALL CONFORM TO CITY CODES, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION LATEST EDITION AND STANDARD DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THESE STANDARDS AND CODES AT ALL TIMES.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO SCHEDULE INSPECTION 48 HOURS PRIOR TO BEGINNING ANY WORK. CALL FOR INSPECTION AT (714) 781-6190 BETWEEN THE HOURS OF 9:00 A.M. TO 4:00 P.M. MONDAY THROUGH FRIDAY.
4. CONTRACTOR SHALL MAINTAIN TRAFFIC CONTROL IN ACCORDANCE WITH CALTRANS TRAFFIC MANUAL AND MATCH MANUAL AT ALL TIMES DURING CONSTRUCTION AS APPROVED BY CITY ENGINEER OR HIS REPRESENTATIVE. FAILURE TO DO SO SHALL REQUIRE IMMEDIATE WORK STOPPAGE.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ARRANGE FOR THE NECESSARY RELOCATION OF ANY UTILITIES. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED AT LEAST 48 HOURS PRIOR TO BEGINNING WORK. CALL 1-800-422-4133 (UNDERGROUND SERVICE ALERT) AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE A RESPONSIBLE REPRESENTATIVE AT THE JOB SITE AT ALL TIMES DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION AND COST OF ALL EXISTING UTILITIES. CONTRACTOR MUST INFORM CITY OF LAKE ELSINORE OF CONSTRUCTION SCHEDULE PRIOR TO THE BEGINNING OF CONSTRUCTION.
8. ALL UNDERGROUND FACILITIES AND LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET SECTION, INCLUDING BUT NOT LIMITED TO SEWER, WATER, TELEPHONE, ELECTRICITY, GAS AND DRAINAGE FACILITIES.
9. ALL STREET SECTIONS ARE TENTATIVE. ADDITIONAL SOIL TESTS WILL BE TAKEN AFTER ROUGH GRADING TO DETERMINE THE EXACT SECTION REQUIRED. SECTION THICKNESSES SHOWN ARE FOR BONDING PURPOSES ONLY.
10. ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES MUST BE POTHOLED AND ELEVATIONS VERIFIED PRIOR TO CONSTRUCTION. THE ENGINEER OF RECORD SHALL BE NOTIFIED OF ANY NECESSARY REVISIONS TO THE APPROVED PLANS. THE REVISIONS SHALL BE IN THE FORM OF "AS-BUILT" PLANS SUBMITTED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO THE FINAL ACCEPTANCE OF THE PROJECT BY THE CITY ENGINEER.
11. ALL EXISTING MONUMENTATION DISTURBED OR DESTROYED DURING CONSTRUCTION SHALL BE REPLACED TO CITY STANDARDS AS APPROVED BY THE CITY ENGINEER. CENTERLINE TIES WILL TO BE FURNISHED TO THE CITY ENGINEER BY THE ENGINEER OF RECORD AT COMPLETION OF PROJECT.
12. AN ENCROACHMENT PERMIT SHALL BE REQUIRED FOR ALL CONSTRUCTION WORK DONE WITHIN PUBLIC RIGHTS-OF-WAY. BEFORE ISSUANCE OF SAID PERMIT THE CONTRACTOR MUST PROVIDE THE CITY ENGINEER WITH CERTIFICATE OF INSURANCE, REQUIRED BONDING FOR PUBLIC IMPROVEMENTS. THE ENCROACHMENT PERMIT MUST BE PRESENT AT THE JOB SITE DURING THE TOTAL TIME FRAME OF PROJECT CONSTRUCTION WITH APPROVED SET OF IMPROVEMENT PLANS.
13. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN (14) DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING AND SHALL BE APPLIED AT A RATE OF 0.05 GALLON/SQ. YD. ASPHALTIC EMULSION SHALL CONFORM TO SECTIONS 37, 29 AND 94 OF THE STATE STANDARD SPECIFICATIONS.
14. SEE SHEET 9 FOR CALTRANS GENERAL NOTES.
15. ALL FIRE HYDRANTS SHALL HAVE BLUE RAISED PAVEMENT MARKERS.

NOTE: SOIL REPORTS ARE AVAILABLE AT ENGINEER'S OFFICE FOR REVIEW.

REGISTERED PROFESSIONAL ENGINEER
CHIANG HONG-SHING
NO. C41914
EXP. 3-31-92
CIVIL
STATE OF CALIFORNIA

NOTICE TO CONTRACTOR

1. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB-SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.
2. ALL UNDERGROUND UTILITIES OR STRUCTURES REPORTED OR FOUND ON AVAILABLE PUBLIC RECORDS ARE INDICATED WITH THEIR APPROXIMATE LOCATION AND EXTENT. THE CONTRACTOR BY ACCEPTING THESE PLANS OR PROCEEDING WITH THE IMPROVEMENTS HEREON, AGREES TO ASSUME LIABILITY AND HOLD THE ENGINEER HARMLESS FOR ANY DAMAGES RESULTING FROM THE EXISTENCE OF UNDERGROUND UTILITIES OR STRUCTURES NOT OF RECORD, OR THOSE CONSTRUCTED AT VARIANCE WITH REPORTED OR RECORDED LOCATIONS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES, SHOWN AND ANY OTHER UTILITIES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR UNAUTHORIZED CHANGED TO OR USES OF THESE PLANS. ALL CHANGES TO THESE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.
4. THE ENGINEER DOES NOT RECOMMEND OR ENDORSE THE USE OF ASBESTOS-CEMENT WATER PIPE OR ANY PRODUCTS CONTAINING ASBESTOS DUE TO THE HEALTH HAZARD CONNECTED WITH SUCH PRODUCTS. SPECIFICATION HEREON OF ANY SUCH PRODUCT IS AT THE DIRECTION OF THE JURISDICTIONAL AGENCY. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ALL CONSTRUCTION, CONNECTION AND REMOVAL OF ASBESTOS PRODUCTS AND SHALL FOLLOW ALL OSHA & EPA GUIDELINES TO MINIMIZE HEALTH HAZARDS.

NOTE

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

ENGINEERS CERTIFICATE

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY SUPERVISION AND THAT I AM A DULY REGISTERED ENGINEER UNDER THE LAWS OF THE STATE OF CALIFORNIA, REG. NO. C41914.

Hong-Shing Chiang 1-26-91
BY DATE

C41914
EXPIRES: 3-31-92

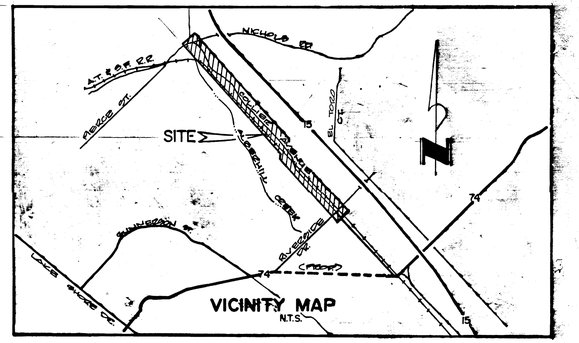
⚠ RECORD DRAWINGS INDICATES AS-BUILT INFORMATION ON THIS DRAWING THAT WAS OBTAINED FROM OTHERS AND MUST BE VERIFIED IN THE FIELD BY ANYONE PRIOR TO USE OR CONSTRUCTION. ALBERT A. WEBB ASSOCIATES IS NOT RESPONSIBLE FOR UNDERGROUND FACILITY LOCATIONS OR DEPICTIONS. ALL ABOVE GROUND FACILITIES CAN BE READILY SEEN AND VERIFIED BY THE PARTIES THAT INTEND TO USE SAME.

DATE SCOTT R. HILDEBRANDT RCE 44762

THESE PLANS HAVE BEEN REVIEWED FOR COMPLIANCE WITH THE APPROPRIATE CONDITIONS OF DEVELOPMENT AND / OR CITY AND STATE LAWS, AND HAVE BEEN FOUND ACCEPTABLE.

EROSION CONTROL NOTES

1. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES, OR TO REPAIR ANY DAMAGED EROSION CONTROL MEASURES WHEN RAIN IS IMMINENT.
2. DEVICES SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE CITY INSPECTOR.
3. ALL NECESSARY REMOVABLE PROTECTIVE DEVICES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE 5-DAY RAIN PROBABLITY FORECAST EXCEEDS 40%.
4. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM CHECK BERMS AND DESILTING BASINS, AND THE BASINS PUMPED DRY. ANY GRADED SLOPE SURFACE PROTECTION MEASURES DAMAGED BY A RAINSTROM SHALL BE IMMEDIATELY REPAIRED.
5. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.



AS BUILT
CALTRANS PERMIT NO. 08-90-N-MC-1929

REVISIONS:	APPROVED BY: Hong-Shing Chiang	ALBERT A. WEBB ASSOCIATES	STREET PLAN & PROFILE	1
5. AS-BUILT/RECORD DATA	DATE: 1-26-91 REGISTERED CIVIL ENGINEER NO. C41914	CIVIL ENGINEERS 3788 McCRAY STREET RIVERSIDE, CALIFORNIA (714) 686-1070	CITY OF LAKE ELSINORE	OF 34 SHEETS
6. Added Driveway & Median opening (Shts 2&4) Ref 2-22-95	THESE PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED. 6-6-91 WILLIAM H. BAGHAM R.C.E. 22439 CITY ENGINEER	SCALE: AS NOTED DRAWN BY: R.C. DESIGNED BY: A.C. CHECKED BY: A.T.	BENCH MARK: SEE SHEET 2	COLLIER AVENUE	FILE NO. 89-335-A
			TITLE SHEET	W.O. 89-335 FOR: F.B. 91-37

index SHEET FOR STREET PLAN - 111[0,180]PF: 89335 1402 25-Jan-91 08:47 PM 89-335-1

SHEET 1 OF 34 SHEETS

DRAWING NUMBER 91-372

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA

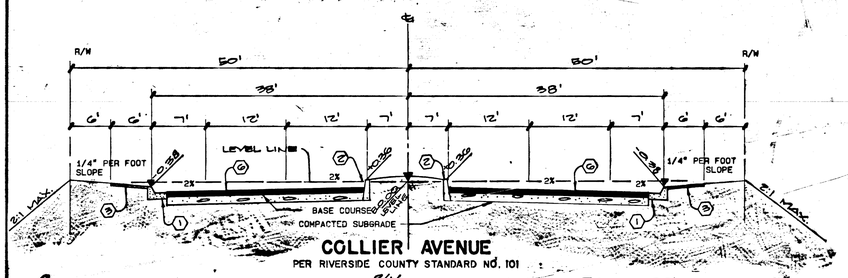
DRAWING NUMBER

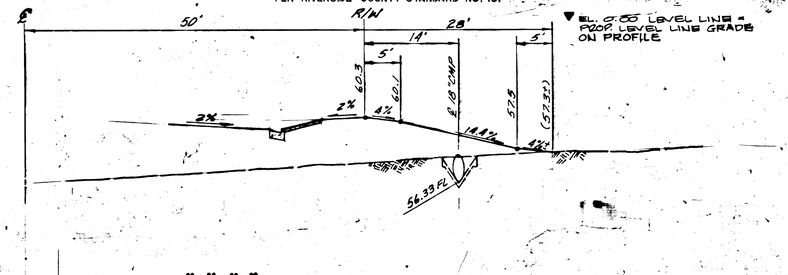
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA

TYPICAL STREET CROSS SECTION



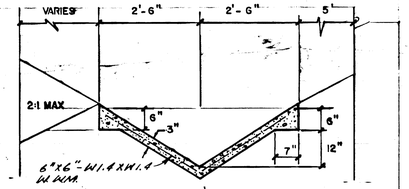


SECTION "A"-"A"

SCALE: HORIZ. : 1"= 10'
VERT. : 1"= 4'

CONSTRUCTION NOTES

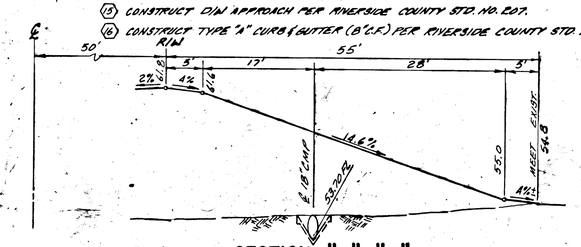
1. CONSTRUCT TYPE "A" CURB AND GUTTER (6" C.F.) PER RIVERSIDE CO. STD. NO. 200
2. CONSTRUCT TYPE "D" CURB PER RIVERSIDE CO. STANDARD NO. 204 (6" C.F.)
3. CONSTRUCT CURB SIDEWALK PER R/V. CO. STD. NO. 400 & 401.
4. CONSTRUCT CROSS GUTTER PER R/V. CO. STD. NO 209 & 210 (10')
5. CONSTRUCT ACCESS RAMP PER RIVERSIDE CO. STD. NO. 403.
6. A.C. PAVING (SEE GENERAL NOTE NO. 9) 4 1/2" AC OVER 12" AB CLASS II T.I.= 8 R=20.
7. CONSTRUCT BARRICADE PER RIVERSIDE CO. STD. NO. 810.
8. PLACE 2" X 4" REDWOOD HEADER.
10. INSTALL ARTERIAL LIGHTING PER RIVERSIDE COUNTY STD NO. 1001
11. CONSTRUCT 5' AIR BLOWN MORTAR SWALE (SEE DETAIL 1 ON THIS SHEET.)
12. CONSTRUCT 6" A.C. DIKE PER R/V. CO STD. NO. 212
13. CONSTRUCT 8" A.C. DIKE PER RIVERSIDE COUNTY STD. NO. 212
14. SAW CUT EXIST. 0.006 OF PAVEMENT AS NOTED
17. CONSTRUCT D/W APPROACH PER RIVERSIDE COUNTY STD. NO. 207.
16. CONSTRUCT TYPE "A" CURB & GUTTER (6" C.F.) PER RIVERSIDE COUNTY STD. NO. 201.



DRAINAGE SWALE DETAIL 1

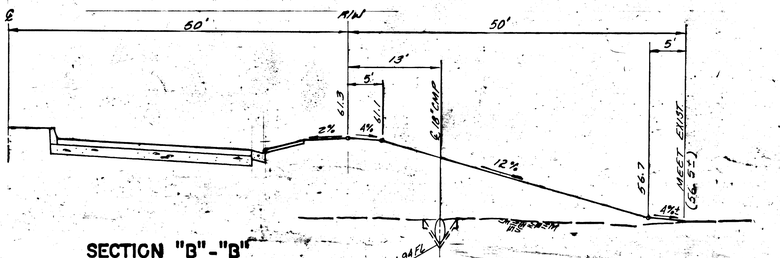
NOT TO SCALE

17. CONSTRUCT UNDER SIDEWALK DRAIN PER RIVERSIDE COUNTY STD. NO. 309, MODIFIED SEE DETAIL 4 SHT. 15.
18. REMOVE EXISTING PAVING.
19. ST. UTILITY POLES TO BE RELOCATED OR ADJUSTED BY OTHERS PER UTILITY RELOCATION PLAN(S).
20. INSTALL REFLECTIVE DELINEATOR @ 20' C/C PER CALTRANS STD F-1, FIGURE C-3A.
21. PAINTED MEDIAN, SEE STRIPING AND PAVING PLAN.
22. CONSTRUCT CURB & GUTTER PER CALTRANS STD. NO 1A, TYPE A2-6.
23. CONSTRUCT 3'-HIGH BLOCK WALL 1' OFFSET FROM R/W PER OCEMA STD. PLANS, 1418.



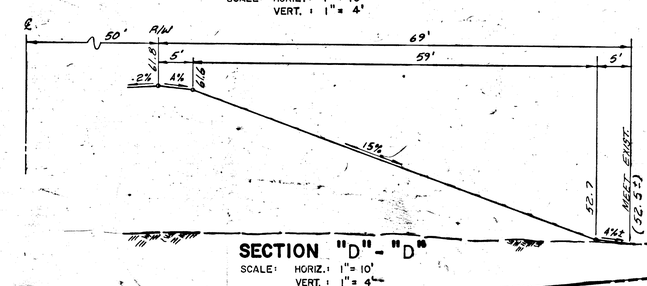
SECTION "C"-"C"

SCALE: HORIZ. : 1"= 10'
VERT. : 1"= 4'



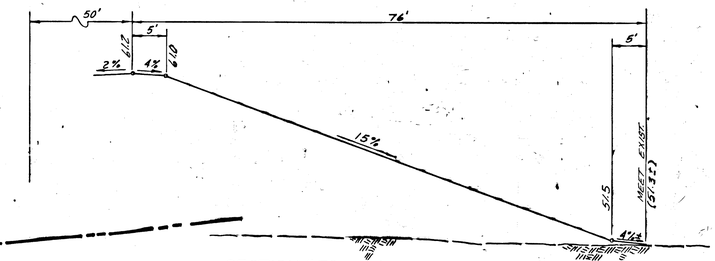
SECTION "B"-"B"

SCALE: HORIZ. : 1"= 10'
VERT. : 1"= 4'



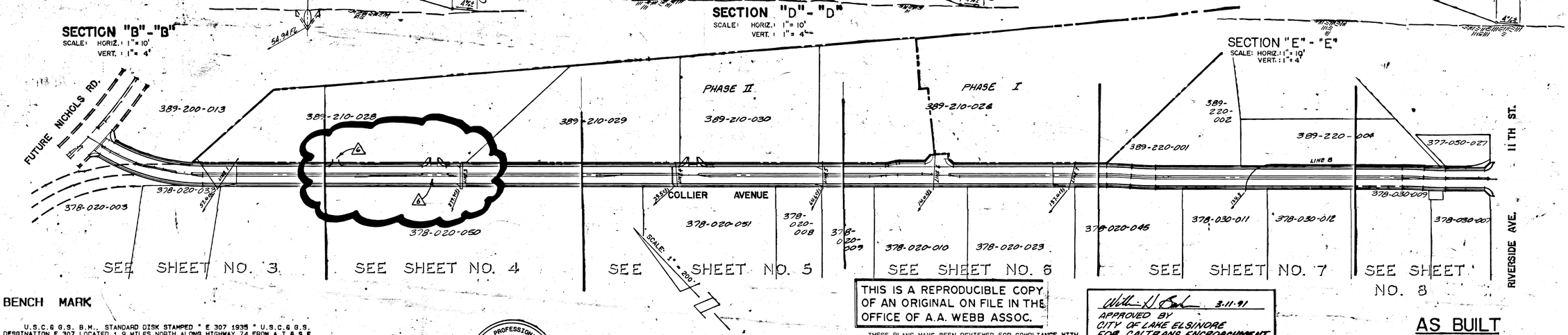
SECTION "D"-"D"

SCALE: HORIZ. : 1"= 10'
VERT. : 1"= 4'



SECTION "E"-"E"

SCALE: HORIZ.: 1"= 10'
VERT.: 1"= 4'



UTILITIES

SEWER AND WATER

ELSINORE VALLEY M.W.D.
39191 MISSION TRAIL
LAKE ELSINORE, CALIFORNIA
(714) 674-3146

TELEPHONE

GENERAL TELEPHONE & ELECTRONICS
120 E. THIRD STREET
PERRIS, CALIFORNIA 92370
1-800-482-5711

ELECTRIC

SO. CALIF. EDISON CO.
2600 MENEFEE ROAD
ROMOLAND, CALIFORNIA 92380
1-800-442-4950

GAS

SO. CALIF. GAS CO.
1981 LUGONIA AVENUE
P.O. BOX 3003
REDLANDS, CALIFORNIA 92373-0306
(714) 335-7748

LEGEND

T.C.	TOP OF CURVE
F.L.	FLOWLINE ELEV.
G.B.	GRADE BREAK
F.G.	FINISH GRADE
F.S.	FINISH SURFACE
INV.	INVERT OF DRAIN
T.B.	TOP OF BERM
B.V.C.	BEGIN VERTICAL CURVE
E.V.C.	END VERTICAL CURVE
P.I.	POINT OF INTERSECTION
E.P.	EDGE OF PAVEMENT
T.W.	TOP OF WALL ELEV.
T.F.	TOP OF FOOTING ELEV.
L.	LENGTH
DWY.	DRIVEWAY
N.T.S.	NOT TO SCALE

SLOPE 2:1 MAX

FILL & GRADE TO DRAIN

1238 EXIST. CONTOUR
PROPERTY LINE
DAYLIGHT LINE
2% SHEET FLOW & RATE
GRADED SWALE
CENTERLINE
SWALE HIGH POINT
FLOWLINE
TOP OF SLOPE
TOE OF SLOPE
RETAINING WALL

BENCH MARK

U.S.C.& G.S. B.M., STANDARD DISK STAMPED " E 307 1935 " U.S.C.& G.S. DESIGNATION E 307 LOCATED 1.9 MILES NORTH ALONG HIGHWAY 74 FROM A.T.& S.F. RAILWAY STATION AT ELSINORE, RIVERSIDE COUNTY, AT THE JUNCTION OF STATE HIGHWAY 71 LEADING NORTHWEST TO CORONA, 35 YARDS SOUTHWEST OF THE SOUTHWEST CORNER OF A SERVICE STATION IN THE TRIANGLE FORMED BY THE JUNCTION, ON THE A.T.& S.F. RAILROAD RIGHT-OF-WAY, 22 YARDS SOUTHEAST OF THE CROSSING OF THE CORONA HIGHWAY, 37 FEET SOUTHWEST OF THE CENTERLINE OF THE SOUTH LEG OF THE JUNCTION, AND 11 FEET NORTH-EAST OF THE TRACT.

ELEVATION = 1274.889

REGISTERED PROFESSIONAL ENGINEER
CHUNG HONG-SUNG
NO. C41914
EXP. 3-31-92
CIVIL
STATE OF CALIFORNIA

THIS IS A REPRODUCIBLE COPY OF AN ORIGINAL ON FILE IN THE OFFICE OF A.A. WEBB ASSOC.

THESE PLANS HAVE BEEN REVIEWED FOR COMPLIANCE WITH THE APPROPRIATE CONDITIONS OF DEVELOPMENT AND / OR CITY AND STATE LAWS, AND HAVE BEEN FOUND ACCEPTABLE.

William H. Basham 3.11.91
APPROVED BY
CITY OF LAKE ELSINORE
FOR CALTRANS ENCROACHMENT PERMIT ONLY

AS BUILT

CALTRANS PERMIT NO. 08-30-N-MC-1929

REVISIONS:	
1 CONSTRUCT 3'-HIGH BLOCK WALL FROM STA. 2+26.50 TO STA. 4+50.	FCT'ccc 8-22-91
2 Added Driveway & Median opening	RT 2-22-95

APPROVED BY: Hong-Sung Chung
DATE: 1-26-91
REGISTERED CIVIL ENGINEER NO. C41914

THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.
WILLIAM H. BASHAM R.C.E 28989 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: AS SHOWN
DRAWN BY: R.C.
DESIGNED BY: A.C.
CHECKED BY: A.T.

BENCH MARK:
SEE UPPER LEFT

STREET PLAN & PROFILE
CITY OF LAKE ELSINORE
COLLIER AVENUE
DETAIL SHEET

W.O. 89-335 | FOR: | F.B.

2
OF 21 SHEETS
FILE NO. 89-335.A
91-372

TITLE SHEET, STREET PLANS, COLLIER A'E - 111[0,180]PF: 89335 1401 25-Jan-91 08:25 AM / 89-335-1

DRAWING NUMBER 11-373

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07041

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07041

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07041

PROFILE
SCALE:
HORIZ. 1"=40'
VERT. 1"=8'

PLAN
SCALE:
1"=40'

STA. 12+00 MATCH LINE SEE SHEET 4

MATCH LINE SEE SHEET NO. 4 STA. 12+00

CONSTRUCTION NOTES :

1. CONSTRUCT TYPE "A" CURB AND GUTTER (6" C.F.) PER RIV. CO. STD. NO. 200.
2. CONSTRUCT TYPE "D" CURB PER RIVERSIDE CO. STD. NO. 204 (6"CF)
3. CONSTRUCT CURB SIDEWALK PER RIVERSIDE CO. STD. NO. 400 & 401.
4. A.C. PAVING (SEE GENERAL NOTE NO.8)
5. CONST. BARRICADE PER RIVERSIDE COUNTY STD. NO. 810.
10. INSTALL ARTERIAL LIGHTING PER RIV. CO. STD. NO. 1001.
11. CONST. 3' AIR BLOWN MORTAR SWALE (SEE DETAIL 1 ON SHT. 2)
12. CONST. 6" A.C. DIKE PER RIVERSIDE COUNTY STD. NO. 212.
14. SAWCUT EX. EDGE OF PAVEMENT AS NOTED
15. CONST. DW APPROACH PER RIV. CO. STD. 207
18. REMOVE EXISTING PAVING
19. ST. UTILITY POLES TO BE RELOCATED OR ADJ. BY OTHERS PER UTILITY RELOC. PLAN(S).
20. INSTALL REFLECTIVE DELINEATOR 60' C. TO C. PER CALTRANS STD. T24, FIGURE 6-34

DATA

	DELTA / BEARING	RADIUS	LEN. / DIST.	TANGENT
1	31°31'56"	800.00	440.27	225.87
2	31°46'42"	838.00	464.79	238.54
3	02°56'29"	793.00	40.71	20.36
4	29°40'43"	762.00	394.71	201.89
5	12°58'26"	807.00	182.73	91.76
6	12°58'26"	803.00	181.83	91.30
7	03°56'21"	797.00	54.79	27.41
8	180°00'00"	2.00	6.28	—
9	05°31'42"	793.00	76.51	38.29
10	159°12'38"	2.00	5.56	10.90
11	17°49'38"	50.00	15.56	7.84
12	05°54'13"	807.00	83.15	41.61
13	06°13'16"	202.00	21.93	10.98

	△	R	L	T
14	06°18'16"	198.00'	21.50	10.76
15	119°24'36"	35.00'	69.28	53.29

NOTE :
ALL POWER POLES OR UTILITY FACILITIES SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED ON UTILITY RELOCATION PLAN.

REGISTERED PROFESSIONAL ENGINEER
CHANG HONG-SUNG
NO. C41914
EXP. 3-31-92
CIVIL
STATE OF CALIFORNIA

COLLIER AVENUE

AS BUILT
PAINTED MEDIAN, 966 ST. STRIPING & PAVING PLAN
CONSTRUCT 3'-HIGH BLOCK WALL 1' OFFSET FROM R/W PER OCEMA STD. PLANS 1614.

REVISIONS:	APPROVED BY:	ALBERT A. WEBB ASSOCIATES	STREET PLAN & PROFILE
1. CONSTRUCT 3'-HIGH BLOCK WALL FROM STA. 2+26.50 TO STA. 4+60. OCT 8-22-91	REGISTERED CIVIL ENGINEER NO. C41914	CIVIL ENGINEERS	CITY OF LAKE ELSINORE
2. AS-BUILT / RECORD DATA	DATE: 1-26-91	3788 McCRAY STREET	COLLIER AVENUE
	THESE PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCES, AND STATE OF CALIFORNIA LAWS. AND A PERMIT TO CONSTRUCT MAY BE ISSUED	RIVERSIDE, CALIFORNIA (714) 686-1070	STA. 1+46.45 TO STA. 12+00.00
	WILLIAM H. BERLAM R.C.E. 28934 CITY ENGINEER	SCALE: H. 1"=40' V. 1"=8'	BENCH MARK: SEE SHEET 2
		DRAWN BY: R.C.	W.O. 89-335 FOR: F.B.
		DESIGNED BY: A.C.	
		CHECKED BY: A.T.	

SHEET 11 OF 34 SHEETS

11-373 OF 21 SHEETS

FILE NO. 89-335-A

RIVERSIDE BLUEPRINT • RIVERSIDE, CALIF.

COLLIER AVE. 40 SCALE PLAN SHEET 2 - 131[0.180]PF: 89335 1102 27-Sep-90 01:46 PM / 89-335-1

DRAWING NUMBER 91-374

DRAWING NUMBER

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER OTSAR

PROFILE
SCALE:
HORIZ. 1"=40'
VERT. 1"=8'

PLAN
SCALE:
1"=40'

SCALE: 1" = 40'

STA. 12+00 MATCH LINE SEE SHEET 3

SEE SHEET 5 MATCH LINE STA. 23+00

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

TAN. = -1.67%

TAN. = -0.62%

EXIST. GROUND 50' LT.

EXIST. GROUND C. L.

EXIST. GROUND 50' RT.

ELEV. "A" @ ℄

PROP. T.C. GRADE 38' LT. (6" C.F.)

PROP. T.C. GRADE 38' RT. (6" C.F.)

PROP. T.C. GRADE 38' LT. (6" C.F.)

PROP. T.C. GRADE 38' RT. (6" C.F.)

50' V.C. P.I. = 1259.18

50' V.C. P.I. = 1259.55

50' V.C. P.I. = 1262.10

50' V.C. P.I. = 1261.79

50' V.C. P.I. = 1262.29

50' V.C. P.I. = 1261.92

0.5%

-0.5%

0.623%

1260

1259.99 T.C.

1259.49 T.C.

1260.49 T.C.

1260.05 T.C.

1261.30 T.C.

1261.67 T.C.

1261.48 T.C.

1261.92 T.C.

1261.29 T.C.

1261.48 T.C.

1261.61 T.C.

1261.12 T.C.

1261.49 T.C.

1261.99 T.C.

1260.99 T.C.

1260.67 T.C.

1261.48 T.C.

1261.98 T.C.

1261.92 T.C.

1261.35 T.C.

1261.80 T.C.

1261.92 T.C.

1261.78

DRAWING NUMBER 91-375

DRAWING NUMBER

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA

COLLIER AVENUE

SEE SHEET 4 — STA. 23+00 — MATCH LINE

SEE SHEET 6 — STA. 34+00 — MATCH LINE

PROFILE
SCALE:
HORIZ. 1"=40'
VERT. 1"=8'

PLAN
SCALE:
1"=40'

23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00

ST. SECTION 4" A.C. OVER 8" BASE (CLASS II)

ST. SECTION 4" A.C. OVER 4" BASE (CLASS II)

SCALE 1" = 40'

CONSTRUCTION NOTES :

1. CONSTRUCT TYPE "A" CURB AND GUTTER (6" C.F.) PER RIV. CO. STD. NO. 200
2. CONSTRUCT TYPE "D" CURB (6" C.F.) PER RIV. CO. STD. NO. 204
3. CONSTRUCT CURB SIDEWALK PER RIVERSIDE CO. STD. NO. 400 & 401.
4. CONSTRUCT CROSS GUTTER PER RIV. CO. STD. NO. 209 & 210 (10')
5. CONSTRUCT ACCESS RAMP PER RIV. CO. STD. NO. 403.
6. A.C. PAVING (SEE GENERAL NOTE NO. 8)
7. ST. UTILITY POLES TO BE RELOCATED OR ADJ. BY OTHERS PER UTILITY RELOCATION PLANS).
10. INSTALL ARTERIAL LIGHTING PER RIV. CO. STD. NO. 1001.
17. CONST. UNDER SIDEWALK DRAIN PER RIVERSIDE COUNTY STD. NO. 302

23. CONSTRUCT 3'-HIGH BLOCK WALL 1' OFFSET FROM R/W PER OCEMA STD. PLANS 1618.

NOTE:
ALL POWER POLES OR UTILITY FACILITIES SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE INDICATED ON UTILITY RELOCATION PLAN.

DATA				
	DELTA/BEARING	RADIUS	LEN/DIST.	TANGENT
1	91°31'(41)"	35.00	55.91'	35.94'
2	85°35'47"	35.00	52.29	32.41

REGISTERED PROFESSIONAL ENGINEER — OKLANS HONG-SUNG — NO. C41914 EXP. 3-31-93 — CIVIL — STATE OF CALIFORNIA

REVISIONS:
- A CONSTRUCT 3'-HIGH BLOCK WALL FROM STA. 27+76.50 TO STA. 28+60. PCT 8-22-91
- B ADD LEFT TURN POCKET @ STA 31+34 ± PCT 10-30-91
- C WIDEN DRIVEWAY & MEDIAN OPENING FROM 35' TO 50' PCT 6-5-92
- D AS-BUILT / RECORD DATA

APPROVED BY: Hong-Sung Chris
DATE: 1-26-91
REGISTERED CIVIL ENGINEER NO. C41914

THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.

WILLIAM H. BASHAM R.C.E. 23839 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: H. 1"= 40' V. 1"=8'
DRAWN BY: R.C.
DESIGNED BY: A.C.
CHECKED BY: R.T.

BENCH MARK: SEE SHEET 2

STREET PLAN & PROFILE
CITY OF LAKE ELSINORE
COLLIER AVENUE

STA. 23+00.00 TO STA. 34+00.00

W.O. 89-335 | FOR: | F.B.

5 OF 21 SHEETS

FILE NO. 89-335.A

AS BUILT

RIVERSIDE BLUEPRINT • RIVERSIDE, CALIF.

DRAWING NUMBER 91-376

DRAWING NUMBER

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
RESPONSIBILITY NUMBER 017041

VARIED CURB FACE

50'VC. PI=1266.36

EXIST. GAS P.U. MET. PI=1264.28

EXIST. P.U. MET. PI=1261.11

PROP. T.C. GRADE 38' LT. (6" C.F.)

0.62%

EXIST GROUND 50' LT.

ELEV. "A" @ ℄

0.5%

EXIST GROUND ℄

PROP. T.C. GRADE 38' RT. (6" C.F.)

EXIST GROUND 50' RT.

50'VC. PI=1261.73

50'VC. PI=1261.36

125.45' INV. LINE

1260.89 INV. LINE

123.39' INV. LINE

SEE SHEET 5 MATCH LINE STA. 34+00

SEE SHEET 7 MATCH LINE STA. 45+00

34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00

1260

VC=30'
PI=1258.98

50'VC. PI=1258.85

50'VC. PI=1258.98

125.72' INV. LINE

125.50' INV. LINE

125.35' INV. LINE

125.25' INV. LINE

125.04' INV. LINE

50'VC. PI=1258.98

PROFILE
SCALE:
HORIZ. 1"=40'
VERT. 1"=8'

PLAN
SCALE:
1"=40'

SCALE: 1"=40'

CONSTRUCTION NOTES :

1. CONSTRUCT TYPE "A" CURB AND GUTTER (6" C.F.) PER RIV.CO. STD. NO. 200.
2. CONSTRUCT TYPE "D" CURB PER RIVERSIDE CO. STD. NO. 204 (6" C.F.)
3. CONSTRUCT CURB SIDEWALK PER RIVERSIDE CO. STD. NO. 400 & 401.
4. CONSTRUCT CROSS GUTTER PER RIVERSIDE CO. STD. NO. 209 & 210 (10')
5. CONSTRUCT ACCESS RAMP PER RIVERSIDE CO. STD NO. 403.
6. A.C. PAVING (SEE GENERAL NOTE NO. 8)
7. CONSTRUCT BARRICADE PER RIVERSIDE CO. STD. NO. 810.
8. PLACE 2" X 4" REDWOOD HEADER.
9. INSTALL ARTERIAL LIGHTING PER RIV. CO. STD. NO. 1001.
10. CONSTRUCT D/W APPROACH PER RIV. CO. STD NO. 207

11. ST. UTILITY POLES TO BE RELOCATED OR ADJ. BY OTHER PER UTILITY RELOC. PLAN (9).
12. CONSTRUCT 3'-HIGH BLOCK WALL 1' OFFSET FROM R/W PER OCEMA STD PLANS 1614.
13. AT APPROX. STA. 43+00 THE EXIST. WATERLINE CROSSES SEWER.
14. AT APPROX. STA. 43+20 IS A CONDUIT RUNNING ALONGSIDE SEWER AT A DEPTH OF 2½'±
15. IMPORT BACKFILL OVER SEWER FROM M.H. AT STA. 41+88 TO M.H. AT STA. 43+00 AN AVERAGE WAS TAKEN, SEE BELOW.

TYPICAL TRENCH WIDTH TO NICHOLS RD. FROM M.H. @ STA. 43+00

DATA

	DELTA/BEARING	RADIUS	LEN./DIST.	TANGENT
1				
2	180°0'0"	2.00	6.28	-
3	180°0'0"	3.00	9.42	-
4	14°51'14"	50.00	12.96	6.52
5	94°24'13"	35.00	57.67	37.80
6	85°35'47"	35.00	52.29	32.41
7				
8				

EXISTING ~~PROPOSED~~ SEWER PUMP STATION
PAD 1259.2

WET LANDS

N 4°08'01"E 40.00

SLOPE 2:1 MAX.

SLOPE 1:2 MAX.

R/W

PROP. 24'W

EX. 12"W

EX. 18" RCP

EX. 12" RCP

54" RCP

18" RCP

4" CONDUIT 6'-DEEP

LINE T-A STA. 43+00 18" RCP

1252.00 INV. 152.8 CFS

1250.30 INV. 14 CFS

1251.50 INV. 152.8 CFS

1251.00 INV. 152.8 CFS

1250.50 INV. 152.8 CFS

1250.00 INV. 152.8 CFS

1249.50 INV. 152.8 CFS

1249.00 INV. 152.8 CFS

1248.50 INV. 152.8 CFS

1248.00 INV. 152.8 CFS

1247.50 INV. 152.8 CFS

1247.00 INV. 152.8 CFS

DRAWING NUMBER 91-377

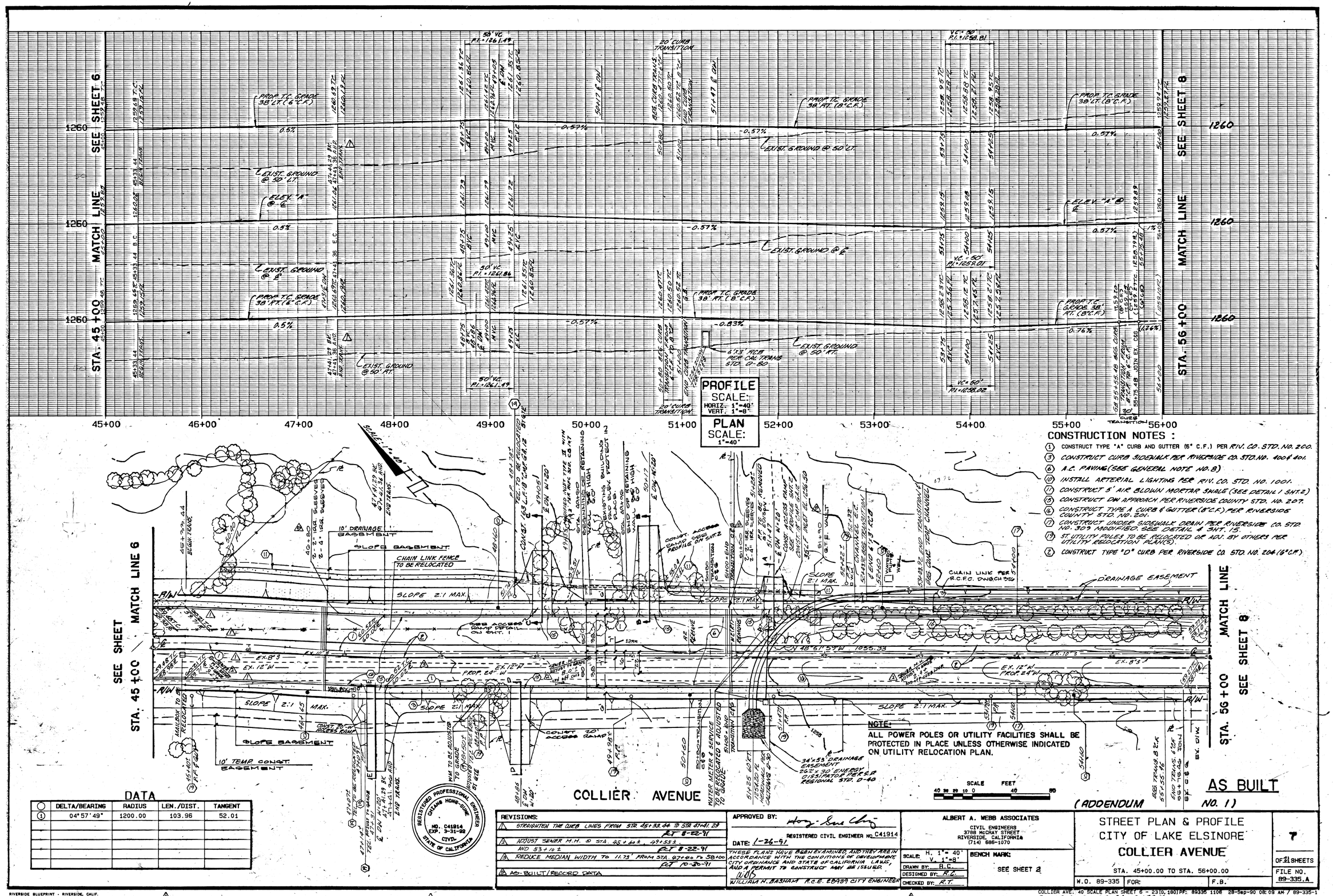
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REDESIGN BY NUMBER(S) 01, 02, 03, 04, 05, 06

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REDESIGN BY NUMBER(S) 01, 02, 03, 04, 05, 06

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REDESIGN BY NUMBER(S) 01, 02, 03, 04, 05, 06



DATA

	DELTA/BEARING	RADIUS	LEN./DIST.	TANGENT
1	04°57'49"	1200.00	103.96	52.01

REVISIONS:
- STRAIGHTEN THE CURB LINES FROM STA. 45+33.44 TO STA. 47+41.29 RT 8-22-91
- ADJUST SEWER M.H. @ STA. 45+60± , 49+55± AND 53+12± RT 8-22-91
- REDUCE MEDIAN WIDTH TO 11.75' FROM STA. 47+46 TO 58+00 RT 10-30-91
- AS-BUILT / RECORD DATA

APPROVED BY: _____
REGISTERED CIVIL ENGINEER NO. C41914
DATE: 1-26-91

THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.
WILLIAM H. BASHAM R.C.E. 28439 CITY ENGINEER

REGISTERED PROFESSIONAL ENGINEER CHIANG HONG-SHING NO. C41914 EXP. 3-31-92 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: H. 1"= 40' V. 1"=8'
DRAWN BY: R.C.
DESIGNED BY: R.C.
CHECKED BY: R.T.
BENCH MARK: SEE SHEET 2

STREET PLAN & PROFILE
CITY OF LAKE ELSINORE
COLLIER AVENUE
STA. 45+00.00 TO STA. 56+00.00

W.O. 89-335 | FOR: | F.B.

7 OF 21 SHEETS
FILE NO. 89-335.A

RIVERSIDE BLUEPRINT - RIVERSIDE, CALIF.

COLLIER AVE. 40 SCALE PLAN SHEET 6 - 23[0, 180] PF: 89335 1108 28-Sep-90 08:09 AM / 89-335-1

SHEET 7 OF 21 SHEETS

DRAWING NUMBER 91-378

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REVISION BY NUMBER/DATE

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REVISION BY NUMBER/DATE

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REVISION BY NUMBER/DATE

STA. 56+00 MATCH LINE SEE SHEET 7

SEE SHEET 7 STA. 56+00 MATCH LINE

COLLIER AVENUE

PROFILE SCALE: HORIZ. 1"=40' VERT. 1"=8'

PLAN SCALE: 1"=40'

56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00

EXIST. GROUND @ R/W

PROP. TG GRADE 38' LT. (8" C.F.)

EXIST. GROUND @ ℄

ELEV. "A" @ ℄

EXIST. GROUND @ R/W

EX. TG GRADE 38' RT. (8" C.F.)

PROP. TG GRADE 38' RT. (8" C.F.)

BEG. REMOVE & REPLACE EX. C&G

20' TRANSITION

180' V.C. PI = 1203.79

180' V.C. PI = 1203.99

50' V.C. PI = 67.90

EXIST. E.P.P. @ 18'± RIVERSIDE DR.

PROP. E.P.P. 9'±

EXIST. GROUND @ R/W

L = 54.62'

L = 64.98'

PI. MEET PI = 1206.79

PI. MEET PI = 1206.79

BEG. TRANS. FROM CRUCIFORM TO CALTRANS STD. NO. A86 STANDARD

BEG. CALTRANS C4G

END CALTRANS C4G

BEG. TRANS. FROM CALTRANS STD. NO. A86 STANDARD TO CRUCIFORM

END CALTRANS C4G

STD. NO. A1A

STD. NO. A1A

EXIST. ASPHALT

PROP. A.C.

EXIST. A.C.

PROP. B.C.R.

EX. B.C.R.

EX. CROWN SLOPE > 2%

REFERENCE POINT FOR EX. SLOPE > 2%

EX. CROWN SLOPE ℄ 2%

REFERENCE POINT FOR EX. SLOPE ℄ 2%

STRUCTURAL SEC. PER GEO'S ENGINEER W/TI= 10.6 TRAFFIC AREA: TI= 6.4 SHOULDER AREA

DBL. YELLOW LINE

EX. B.C.R.

EX. GRADE

ASPHALT

HATCH 6:1 MAX.

SCALE: H. 1"=10' V. 1"=2'

TYPICAL SECTION "AA"

LOOKING SOUTHERLY

NOTE:
ALL POWER POLES OR UTILITY FACILITIES SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE INDICATED ON UTILITY RELOCATION PLAN.

CONSTRUCTION NOTES :

1. CONSTRUCT TYPE "A" CURB AND GUTTER (6"C.F.) PER R/V. CO. STD. NO. 200.
2. CONSTRUCT TYPE "D" CURB PER RIVERSIDE CO. STD. NO. 204 (6"C.F.)
3. CONSTRUCT CURB SIDEWALK PER RIVERSIDE CO. STD. NO. 400 & 401.
6. A.C. PAVING (SEE GENERAL NOTE NO. 6 ON SHT. 9)
12. INSTALL ARTERIAL LIGHTING PER STANDARD NO. 1001.
14. SAW CUT EXIST. EDGE OF PAVEMENT AS GENERAL NOTE NO. 18 ON SHT. 9.
15. CONSTRUCT D.W. APPROACH PER R/V. CO. STD. NO. 207.
16. CONSTRUCT TYPE "A" CURB & GUTTER (8"C.F.) PER RIVERSIDE COUNTY STD. NO. 201.
17. ST. UTILITY POLES TO BE RELOCATED OR ADJUSTED BY OTHERS PER UTILITY RELOCATION PLAN(S).
20. INSTALL REFLECTIVE DELINEATOR @ 20' C TO C PER CAL TRANS STD. ELEC. FIGURE 6-3A
21. PAINTED MEDIAN, SEE STRIPING & PAVING PLAN.
22. CONST. ASPHALT CONCRETE DIKE PER CALTRANS STD. NO. 8-A, TYPE A.

CONSTR. ACCESS RAMP PER CALTRANS STD. NO. 8-B CASE "A" MODIFIED

PROPOSED C&G BY OTHERS

EX. 24" C.M.P. TO BE REMOVED & DISCARDED

SAW CUT EXIST. EDGE OF PAVEMENT

EXIST. GOLD SIGNS TO BE REMOVED AND RELOCATED PER STRIPING AND SIGNING PLAN.

DRAINAGE EASEMENT

SLOPE EASEMENT

EX. 10'± SWITCHING A.T.&T. CONDUIT

EX. 12" W

EX. 16" W

EX. 8" S

EX. 24" S

EX. 8" W

EX. 12" W

EX. 6" W

EX. 8" W

EX. 10" W

EX. 6" S

EX. 8" S

EX. 12" S

EX. 15" S

EX. 18" S

EX. 21" S

EX. 24" S

EX. 30" S

EX. 36" S

EX. 42" S

EX. 48" S

EX. 54" S

EX. 60" S

EX. 66" S

EX. 72" S

EX. 78" S

EX. 84" S

EX. 90" S

EX. 96" S

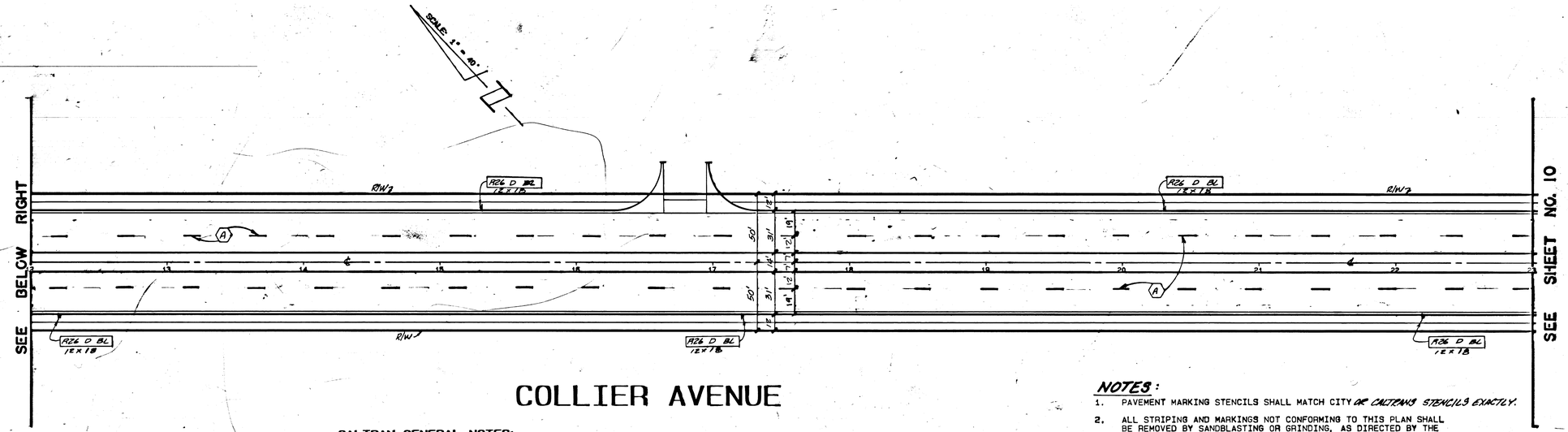
EX.

DRAWING NUMBER 91-379

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 01549

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 01549



COLLIER AVENUE

CALTRAN GENERAL NOTES:

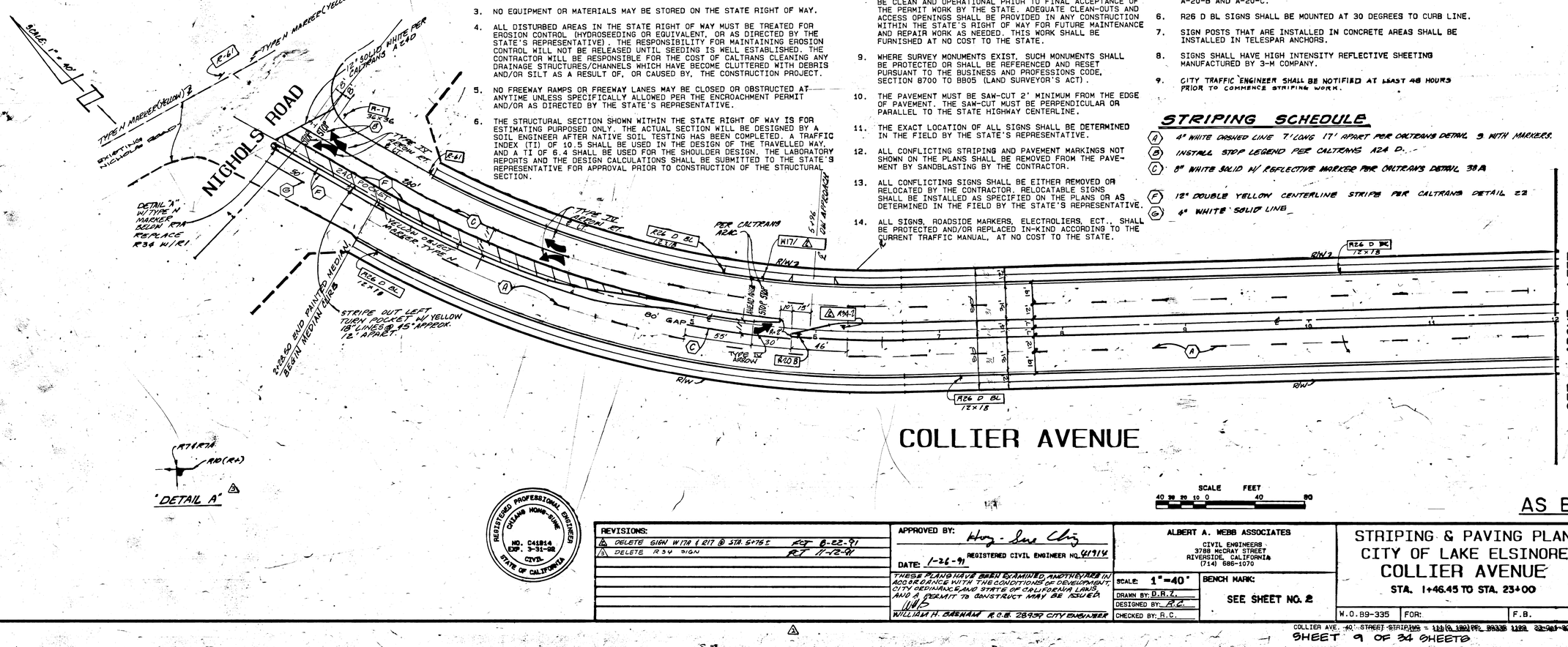
1. AN ENCROACHMENT PERMIT IS REQUIRED BEFORE ANY WORK MAY BEGIN IN OR NEAR THE STATE RIGHT OF WAY.
2. ALL WORK WITHIN THE STATE RIGHT OF WAY SHALL CONFORM TO THE LATEST STATE STANDARD PLANS & SPECIFICATIONS OR AS DIRECTED BY THE STATE'S REPRESENTATIVE (STANDARDS OTHER THAN STATE MUST BE PRE-APPROVED AND JUSTIFIED).
3. NO EQUIPMENT OR MATERIALS MAY BE STORED ON THE STATE RIGHT OF WAY.
4. ALL DISTURBED AREAS IN THE STATE RIGHT OF WAY MUST BE TREATED FOR EROSION CONTROL (HYDROSEEDING OR EQUIVALENT, OR AS DIRECTED BY THE STATE'S REPRESENTATIVE). THE RESPONSIBILITY FOR MAINTAINING EROSION CONTROL WILL NOT BE RELEASED UNTIL SEEDING IS WELL ESTABLISHED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF CALTRANS CLEANING ANY DRAINAGE STRUCTURES/CHANNELS WHICH HAVE BECOME CLUTTERED WITH DEBRIS AND/OR SILT AS A RESULT OF, OR CAUSED BY, THE CONSTRUCTION PROJECT.
5. NO FREEWAY RAMPS OR FREEWAY LANES MAY BE CLOSED OR OBSTRUCTED AT ANYTIME UNLESS SPECIFICALLY ALLOWED PER THE ENCROACHMENT PERMIT AND/OR AS DIRECTED BY THE STATE'S REPRESENTATIVE.
6. THE STRUCTURAL SECTION SHOWN WITHIN THE STATE RIGHT OF WAY IS FOR ESTIMATING PURPOSED ONLY. THE ACTUAL SECTION WILL BE DESIGNED BY A SOIL ENGINEER AFTER NATIVE SOIL TESTING HAS BEEN COMPLETED. A TRAFFIC INDEX (TI) OF 10.5 SHALL BE USED IN THE DESIGN OF THE TRAVELLED WAY, AND A TI OF 6.4 SHALL BE USED FOR THE SHOULDER DESIGN. THE LABORATORY REPORTS AND THE DESIGN CALCULATIONS SHALL BE SUBMITTED TO THE STATE'S REPRESENTATIVE FOR APPROVAL PRIOR TO CONSTRUCTION OF THE STRUCTURAL SECTION.
7. ALL STATE DRAINAGE STRUCTURES MUST FIRST BE COMPLETELY CLEANED OF DEBRIS AND/OR SILT BY THE CONTRACTOR PRIOR TO MAKING THE CONNECTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ANY STATE DRAINAGE FACILITY WHICH IS CONNECTED TO OR DIRECTLY AFFECTED BY THE CONTRACTORS OPERATION SHALL BE CLEAN AND OPERATIONAL PRIOR TO FINAL ACCEPTANCE OF THE PERMIT WORK BY THE STATE. ADEQUATE CLEAN-OUTS AND ACCESS OPENINGS SHALL BE PROVIDED IN ANY CONSTRUCTION WITHIN THE STATE'S RIGHT OF WAY FOR FUTURE MAINTENANCE AND REPAIR WORK AS NEEDED. THIS WORK SHALL BE FURNISHED AT NO COST TO THE STATE.
9. WHERE SURVEY MONUMENTS EXIST, SUCH MONUMENTS SHALL BE PROTECTED OR SHALL BE REFERENCED AND RESET PURSUANT TO THE BUSINESS AND PROFESSIONS CODE, SECTION 8700 TO 8805 (LAND SURVEYOR'S ACT).
10. THE PAVEMENT MUST BE SAW-CUT 2' MINIMUM FROM THE EDGE OF PAVEMENT. THE SAW-CUT MUST BE PERPENDICULAR OR PARALLEL TO THE STATE HIGHWAY CENTERLINE.
11. THE EXACT LOCATION OF ALL SIGNS SHALL BE DETERMINED IN THE FIELD BY THE STATE'S REPRESENTATIVE.
12. ALL CONFLICTING STRIPING AND PAVEMENT MARKINGS NOT SHOWN ON THE PLANS SHALL BE REMOVED FROM THE PAVEMENT BY SANDBLASTING BY THE CONTRACTOR.
13. ALL CONFLICTING SIGNS SHALL BE EITHER REMOVED OR RELOCATED BY THE CONTRACTOR. RELOCATABLE SIGNS SHALL BE INSTALLED AS SPECIFIED ON THE PLANS OR AS DETERMINED IN THE FIELD BY THE STATE'S REPRESENTATIVE.
14. ALL SIGNS, ROADSIDE MARKERS, ELECTROLIERS, ECT., SHALL BE PROTECTED AND/OR REPLACED IN-KIND ACCORDING TO THE CURRENT TRAFFIC MANUAL, AT NO COST TO THE STATE.

NOTES:

1. PAVEMENT MARKING STENCILS SHALL MATCH CITY OR CALTRANS STENCILS EXACTLY.
2. ALL STRIPING AND MARKINGS NOT CONFORMING TO THIS PLAN SHALL BE REMOVED BY SANDBLASTING OR GRINDING, AS DIRECTED BY THE ENGINEER.
3. ALL STRIPING AND MARKINGS SHALL HAVE TWO COATS OF PAINT.
4. STRIPING LAYOUT SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION. CONTACT THE ENGINEER 48 HOURS PRIOR TO LAYOUT.
5. STRIPING LAYOUT SHALL BE SUPPLEMENTED WITH RAISED PAVEMENT MARKERS PER DETAILS IN THE CALTRANS STANDARD PLANS A-20-A, A-20-B AND A-20-C.
6. R26 D BL SIGNS SHALL BE MOUNTED AT 30 DEGREES TO CURB LINE.
7. SIGN POSTS THAT ARE INSTALLED IN CONCRETE AREAS SHALL BE INSTALLED IN TELESPAR ANCHORS.
8. SIGNS SHALL HAVE HIGH INTENSITY REFLECTIVE SHEETING MANUFACTURED BY 3-M COMPANY.
9. CITY TRAFFIC ENGINEER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO COMMENCE STRIPING WORK.

STRIPING SCHEDULE

- (A) 4" WHITE DASHED LINE 7' LONG 17' APART PER CALTRANS DETAIL 9 WITH MARKERS.
- (B) INSTALL STOP LEGEND PER CALTRANS A24 D...
- (C) 8" WHITE SOLID W/ REFLECTIVE MARKER PER CALTRANS DETAIL 38A
- (F) 12" DOUBLE YELLOW CENTERLINE STRIPE PER CALTRANS DETAIL 22
- (G) 4" WHITE SOLID LINE



COLLIER AVENUE

SCALE FEET
40 30 20 10 0 40 80

AS BUILT

REGISTERED PROFESSIONAL ENGINEER CHIANG HONG-SUNG NO. C41814 EXP: 3-31-92 CIVIL STATE OF CALIFORNIA

REVISIONS:	
1 DELETE SIGN W17A & R17 @ STA. 5+75±	RT 8-22-91
2 DELETE R34 SIGN	RT 11-12-91

APPROVED BY: [signature]
DATE: 1-26-91 REGISTERED CIVIL ENGINEER NO. 41914

THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.

WHD
WILLIAM H. DASHAM R.C.E. 28937 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: 1"=40'
DRAWN BY: D.R.Z.
DESIGNED BY: R.C.
CHECKED BY: R.C.

BENCH MARK: SEE SHEET NO. 2

STRIPING & PAVING PLAN
CITY OF LAKE ELSINORE
COLLIER AVENUE
STA. 1+46.45 TO STA. 23+00

W.O. 89-335 | FOR: | F.B.

9 OF 21 SHEETS
FILE NO. 89-335-A

COLLIER AVE. 40' STREET STRIPING = 1.15 (0.180) PE: 89335 1199 93-005-90 12:00 PM / 89-335-1

SHEET 9 OF 34 SHEETS

DRAWING NUMBER 91-380

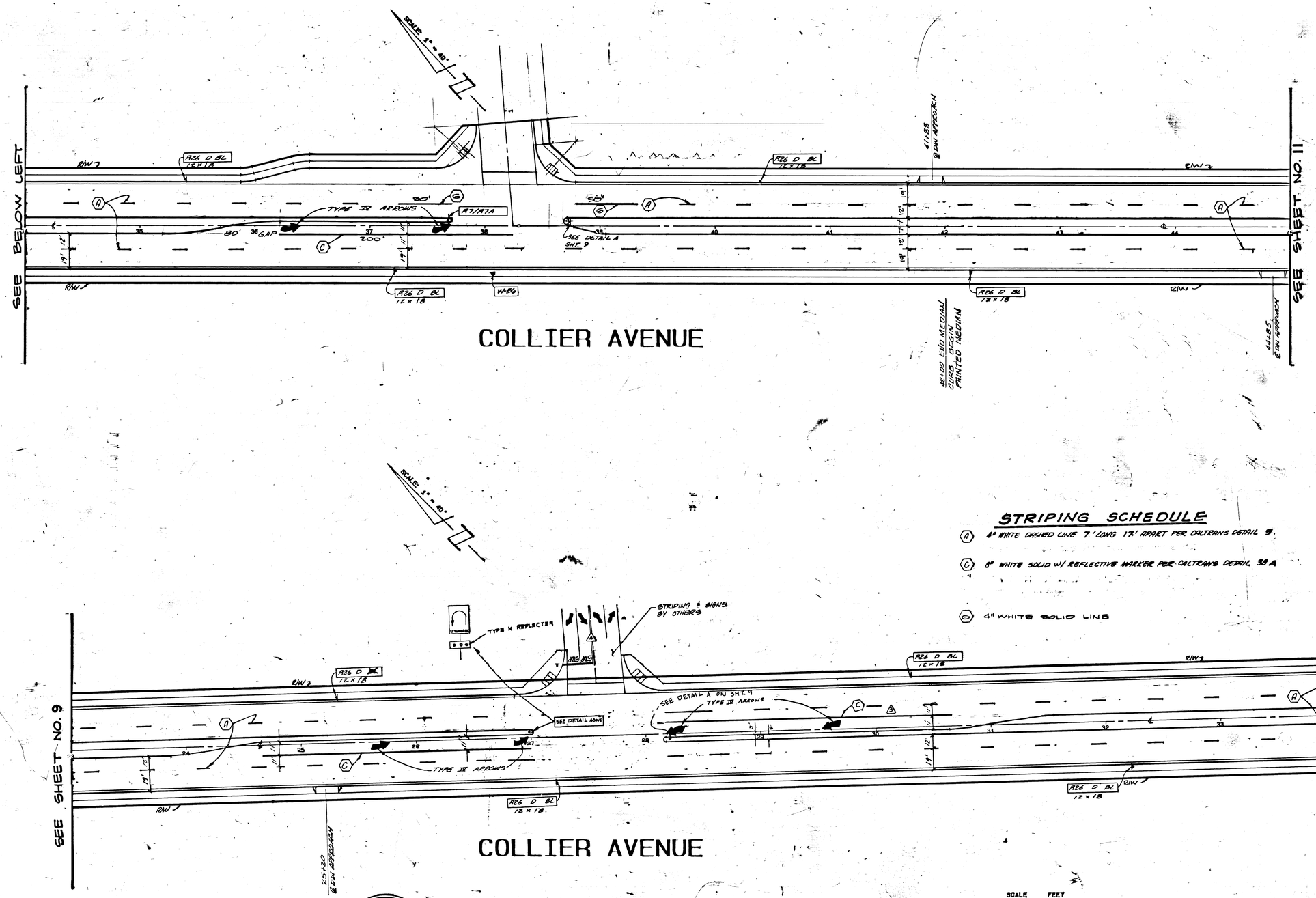
DRAWING NUMBER

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 017041

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 017041

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 017041


SCALE 1" = 40'
SEE BELOW LEFT
SEE SHEET NO. 11
RW
A26 D BL 12 x 18
A26 D BL 12 x 18
A26 D BL 12 x 18
A26 D BL 12 x 18
A26 D BL 12 x 18
W-56
TYPE III ARROWS
A9/A9A
80'
80' GAP
200'
35
36
37
38
39
40
41
42
43
44
45
56'
SEE DETAIL A SHT. 9
41+85 ℄ DW APPROACH
44+85 ℄ DW APPROACH
12'
14'
19'
19'
19'
19'
12'
12'
12

DRAWING NUMBER 91-381

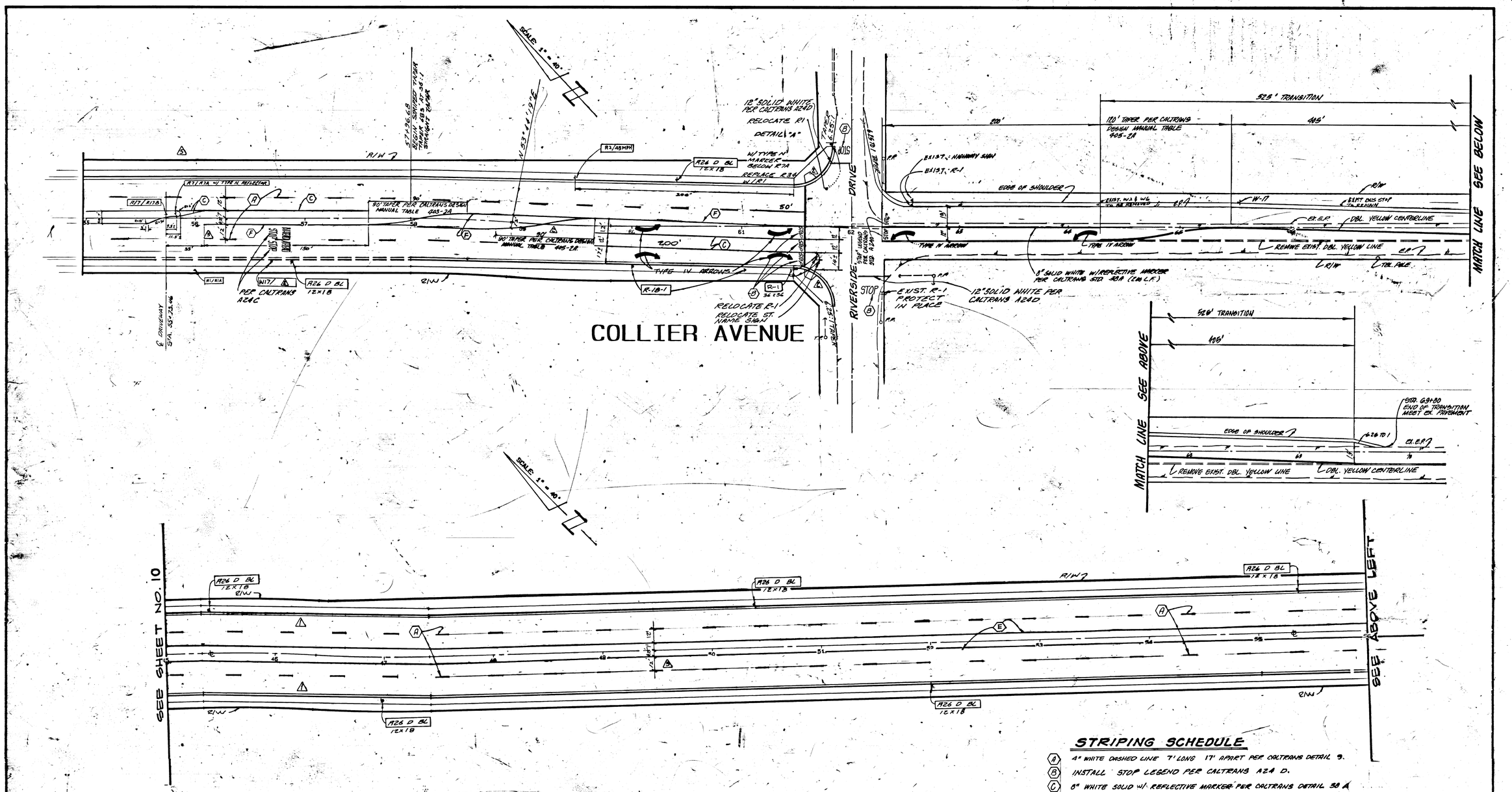
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER DTOAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER DTOAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER DTOAR



Will L. Basham 3-11-91
APPROVED BY
CITY OF LAKE ELSINORE
FOR CALTRANS ENCROACHMENT
PERMIT ONLY

STRIPING SCHEDULE

(A) 4" WHITE DASHED LINE 7' LONG 17' APART PER CALTRANS DETAIL 9.
(B) INSTALL STOP LEGEND PER CALTRANS A24 D.
(C) 8" WHITE SOLID W/ REFLECTIVE MARKERS PER CALTRANS DETAIL 38 A
(E) TYPE "D" CURB PER RIVERSIDE CO. STD. NO. 204 (6" G.F.)
(F) 12" DOUBLE YELLOW CENTERLINE STRIPE PER CALTRANS DETAIL 22
(G) 4" WHITE SOLID LINE

SCALE FEET
40 30 20 10 0 40 80

AS BUILT
(RIDER NO. 1)
CALTRANS PERMIT NO. 08-90-N-MC-1929

REGISTERED PROFESSIONAL ENGINEER CHUNG HONG-SUNG NO. C41916 EXP. 3-31-92 CIVIL STATE OF CALIFORNIA

△5 REUSE MEDIAN & STRIPING FROM STA. 35+60 TO STA. 58+60 RCT 8-5-92

REVISIONS:
△1 STRAIGHTEN CURB AND STRIPING FROM STA. 45+33.44 TO STA. 47+41.28 RCT 8-22-91
△2 REUSE ACCESS RAMPS, ADD NOTES TO LEFT TURN TAPER @ STA. 48+00 ±. ADD TAPER ON SW. SIDE FROM STA. 47+50 TO STA. 47+00 AND R-18-1 AT STA. 61+00 ±, ADD 200' LEFT TURN POCKET PLUS 120' TAPER RCT 8-22-91
△3 REDUCE MEDIAN WIDTH TO 11.75' FROM STA. 47+40 TO 58+00 RCT 11-12-91

APPROVED BY: Hong-Sung Chung
DATE: 1-26-91 REGISTERED CIVIL ENGINEER NO. 41916
THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.
WILLIAM H. BASHAM R.C.E. 28959 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 MCCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: 1"=40'
DRAWN BY: D.R.Z.
DESIGNED BY: R.C.
CHECKED BY: R.C.
BENCH MARK: SEE SHEET NO. 2

STRIPING & PAVING PLAN
CITY OF LAKE ELSINORE
COLLIER AVENUE
STA. 45+00 TO STA. 62+00

W.O. 89-335 | FOR: | F.B.

11 OF 21 SHEETS
FILE NO. 89-335-A

COLLIER AVE. 40' STREET STRIPING - 111[0,180]PF; 89335 1111 24-Oct-90 09:13 AM / 89-335-1
SHEET 11 OF 34 SHEETS

DRAWING NUMBER 91-382

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER DTAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER DTAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER DTAR

1613.3 L.F. 36" RCP 1250-D

CONST. "L" HEADWALL PER CALTRANS STD. D-89 W=34', H=4.9'~4.1', 1'-12" WALL ON NORTH SIDE ONLY

STA. 0+95.79 CONST. J.B. NO. 2 CONC. I.E.=

STA. 0+95.79 CONST. J.B. NO. 2 CONC. I.E.= TO CONNECT TO 18" RCP

ST. STA. 7+30.53 ~ 66.88 RT = 5D STA. 0+79.79

ST. STA. 7+82.59

ST. STA. 8+27.56 ~ 68.26 LT = 5D STA. 2+41.62 CONST. L=81' H=4.9'~4.1', 1'-12" WALL ON NORTH SIDE ONLY

1280

1270

1260

1250

1240

1230

1220

1210

1200

1190

1180

1170

1160

1150

1140

1130

1120

1110

1100

1090

1080

1070

1060

1050

1040

1030

1020

1010

1000

990

980

970

960

950

940

930

920

910

900

890

880

870

860

850

840

830

820

810

800

790

780

770

760

750

740

730

720

710

700

690

680

670

660

650

640

630

620

610

600

590

580

570

560

550

540

530

520

510

500

490

480

470

460

450

440

430

420

410

400

390

380

370

360

350

340

330

320

310

300

290

280

270

260

250

240

230

220

210

200

190

180

170

160

150

140

130

120

110

100

90

80

70

60

50

40

30

20

10

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

-110

-120

-130

-140

-150

-160

-170

-180

-190

-200

-210

-220

-230

-240

-250

-260

-270

-280

-290

-300

-310

-320

-330

-340

-350

-360

-370

-380

-390

-400

DRAWING NUMBER 91-383

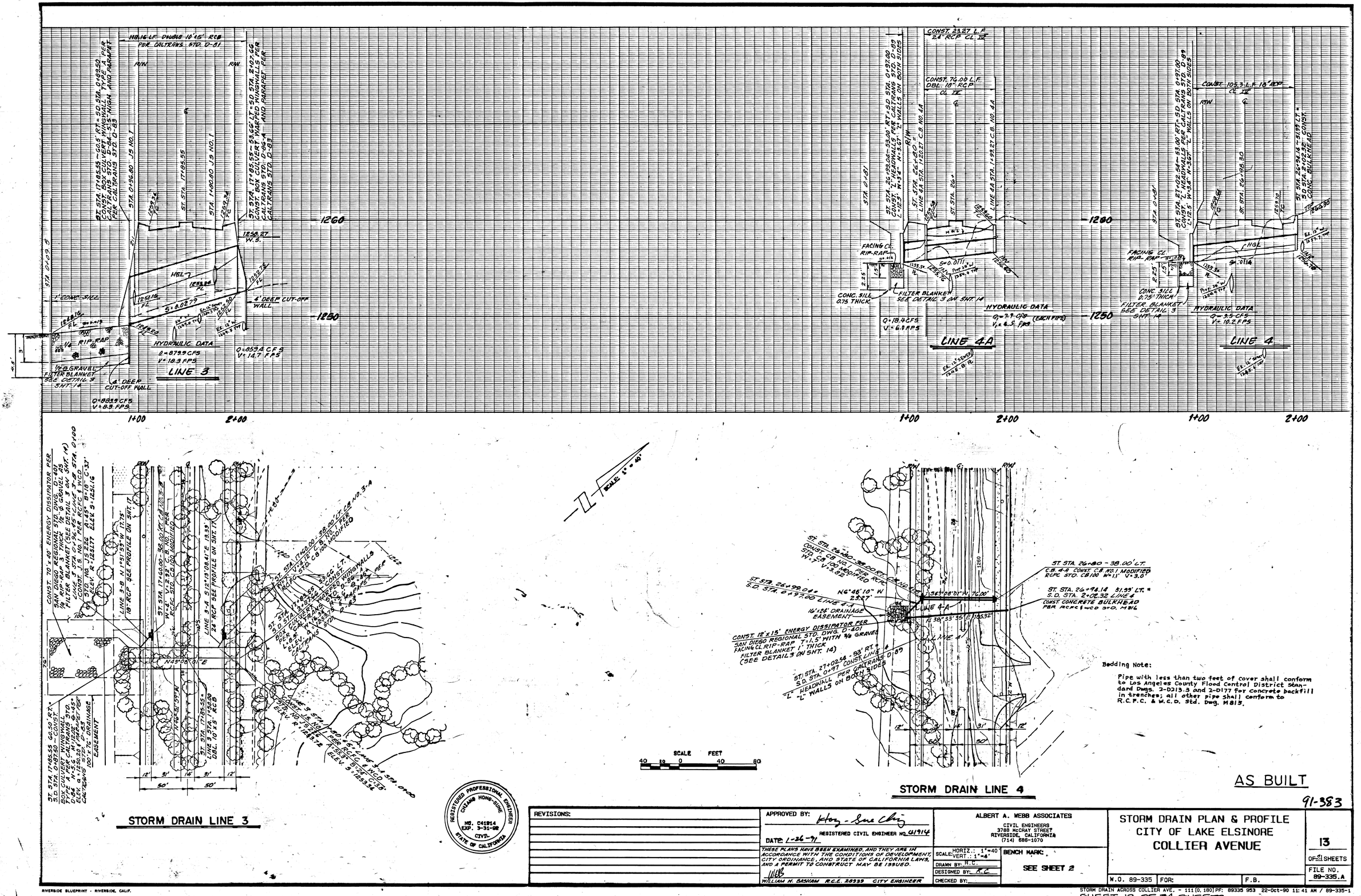
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 870-SAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 870-SAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 870-SAR



CONST. 70'x 40' ENERGY DISSIPATOR PER SAN DIEGO REGIONAL STD. DWG. D-401 FACING CL. RIP-RAP T=1.5' WITH 1/4 GRAVEL FILTER BLANKET (SEE DETAIL 3 ON SHT. 14)
LINE 3 STA. 0+96.45=LINE 3-B STA. 0+00 CONST. 18" RCP CL. III W.C.E. 512.25 C.B. NO.1 MODIFIED PER CALTRANS STD. D-94 SKEW=N.33°-28'-01"E
ELEV. INV. 1252.17 ELEV. S=1250.16
LINE 3-B N 1°51'59" W 11.75'
18" RCP SEE PROFILE ON SHT. 11
ST. STA. 17+60.00 - 38.00' LT. = C.B. NO. 3-A
ST. STA. 17+85.55 - 53.66' LT. = S.D. STA. 2+02.66 CONST. BOX CULVERT WARPED WINGWALLS PER CALTRANS STD. D-96-A AND SACRAMENTO CALTRANS STD. D-93
ST. STA. 17+85.55 S.D. STA. 0+97.00 BOX CULVERT CALTRANS STD. D-94 N=35.6° M=1.428 R=0.45' CLEARING 0.22 AC. CUT 2,400 C.Y. 100'x 76' DRAINAGE EASEMENT
ST. STA. 17+85.55 GO.50'RT.= S.D. STA. 0+87.80 - CONST. BOX CULVER CALTRANS STD. D-94 N=35.6° M=1.428 R=0.45° CLEARING 0.22 AC. CUT 2,400 C.Y. 100'x 76' DRAINAGE EASEMENT
ST. STA. 17+85.55 = 50.00' RT. = LINE 3 STA. 1+36.80 DBL. 10'x5' RCB
ST. STA. 17+85.55 = LINE 3 STA. 1+36.80 DBL. 10'x5' RCB
LINE 3-A S 21°31'08" E 13.33'
24" RCP SEE PROFILE ON SHT. 11
ST. STA. 17+60.00 - 38.00' LT. CB NO. 3-A
W.C.E. 512.25 C.B. NO.1 MODIFIED PER CALTRANS STD. D-86
CONST. 12'x 15' ENERGY DISSIPATOR PER SAN DIEGO REGIONAL STD. DWG. D-401 FACING CL. RIP-RAP T=1.5' WITH 1/4 GRAVEL FILTER BLANKET (SEE DETAIL 3 ON SHT. 14)
CONST. 12'x 15' ENERGY DISSIPATOR PER SAN DIEGO REGIONAL STD. DWG. D-401 FACING CL. RIP-RAP T=1.5' WITH 1/4 GRAVEL FILTER BLANKET (SEE DETAIL 3 ON SHT. 14)
ST. STA. 17+60.00 - 38.00' LT. CONST. 18" RCP CL. III W.C.E. 512.25 C.B. NO.1 MODIFIED PER CALTRANS STD. D-86
ST. STA. 17+85.55 S.D. STA. 0+97.00 BOX CULVERT CALTRANS STD. D-94 N=35.6° M=1.428 R=0.45° CLEARING 0.22 AC. CUT 2,400 C.Y. 100'x 76' DRAINAGE EASEMENT
ST. STA. 17+85.55 = 50.00' RT. = LINE 3 STA. 1+36.80 DBL. 10'x5' RCB
LINE 3 STA. 0+96.45 = LINE 3-B STA. 0+00 CONST. 18" RCP CL. III W.C.E. 512.25 C.B. NO.1 MODIFIED PER CALTRANS STD. D-86
ELEV. INV. 1252.17 ELEV. S=1250.16
LINE 3-A S 21°31'08" E 13.33'
24" RCP SEE PROFILE ON SHT. 11
ST. STA. 17+60.00 - 38.00' LT. CB NO. 3-A
18" RCP
1252
1254
1256
1258
1260
1262
1264
1266
1268
1270
1272
1274
1276
1278
1280
1282
1284
1286
1288
1290
1292
1294
1296
1298
1300
1302
1304
1306
1308
1310
1312
1314
1316
1318
1320
1322
1324
1326
1328
1330

DRAWING NUMBER 91-384

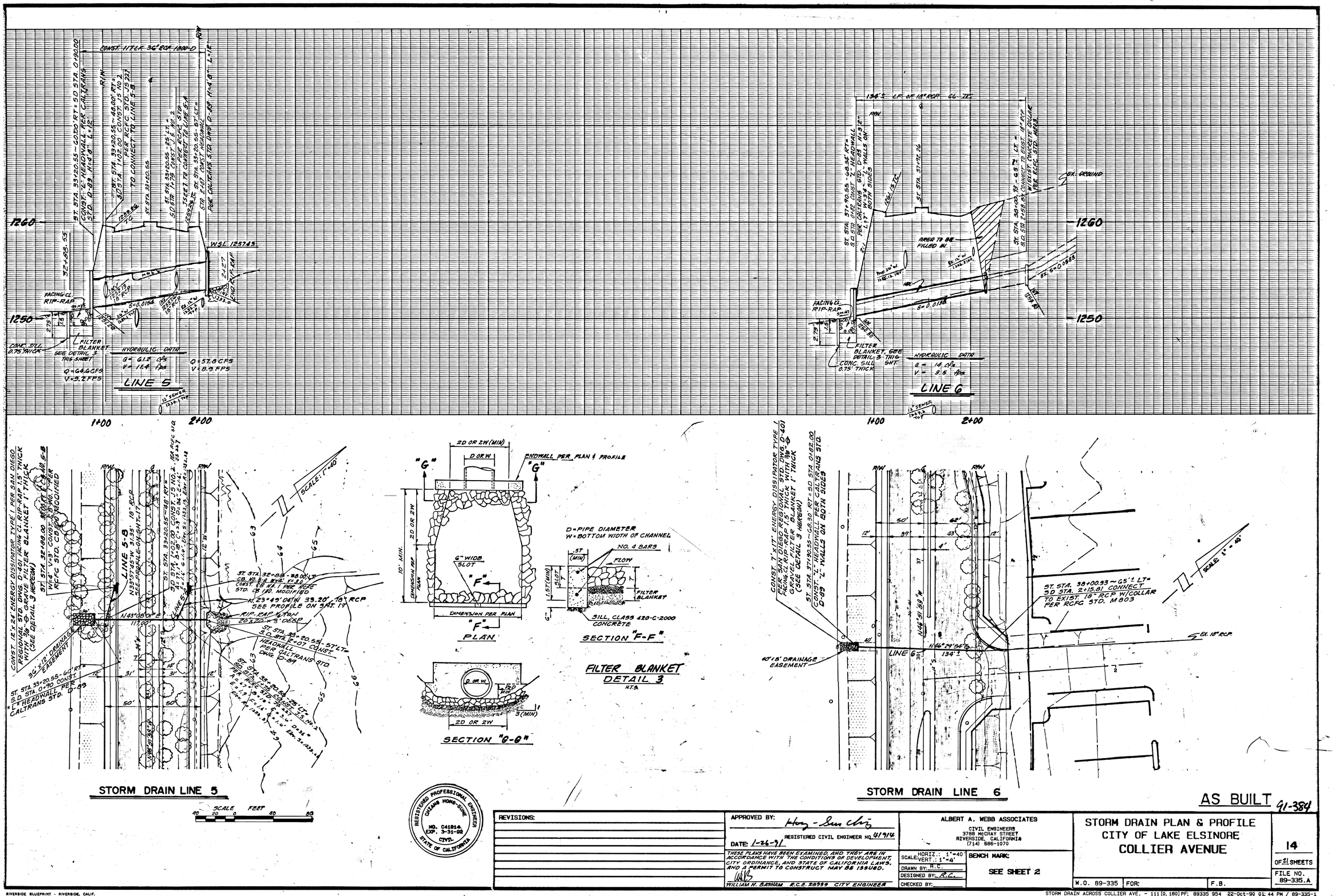
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07349

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07349

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07349



REGISTERED PROFESSIONAL ENGINEER CHIANG HONG-SUNG NO. C41916 EXP. 3-31-92 CIVIL STATE OF CALIFORNIA

REVISIONS:	APPROVED BY: _____ REGISTERED CIVIL ENGINEER NO. 41914 DATE: 1-26-91	ALBERT A. WEBB ASSOCIATES CIVIL ENGINEERS 3788 McCRAY STREET RIVERSIDE, CALIFORNIA (714) 686-1070	STORM DRAIN PLAN & PROFILE CITY OF LAKE ELSINORE COLLIER AVENUE
	THESE PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED. WILLIAM H. BASHAM R.C.E. 28959 CITY ENGINEER	SCALE HORIZ.: 1"=40 VERT.: 1"=4' DRAWN BY: M.C. DESIGNED BY: R.C. CHECKED BY:	BENCH MARK: SEE SHEET 2
		W.O. 89-335 FOR:	F.B.

14 OF 34 SHEETS
FILE NO. 89-335.A

RIVERSIDE BLUEPRINT - RIVERSIDE, CALIF.

STORM DRAIN ACROSS COLLIER AVE. - 111[0,180]PF: 89335 954 22-Oct-90 01:44 PM / 89-335-1

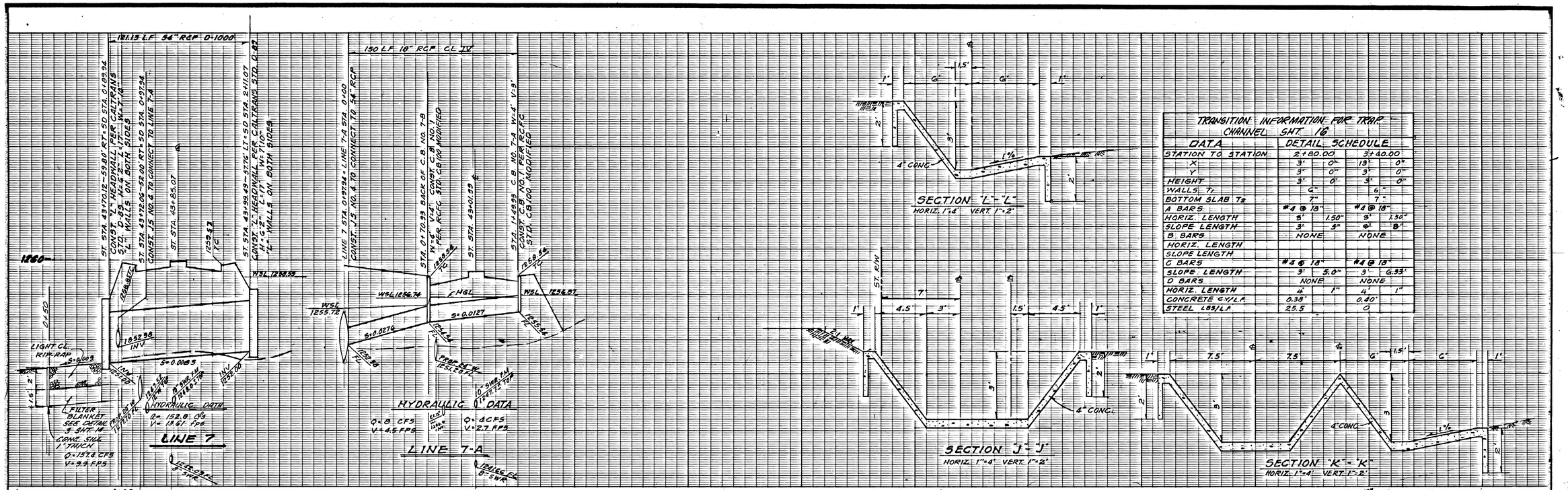
SHEET 14 OF 34 SHEETS

DRAWING NUMBER 91-385

DRAWING NUMBER

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA



REGISTERED PROFESSIONAL ENGINEER CHIANG HONG-SUNG NO. C41954 EXP. 3-31-92 CIVIL STATE OF CALIFORNIA

AS BUILT 91-385

REVISIONS:	APPROVED BY: Hong-Sung Chiang	ALBERT A. WEBB ASSOCIATES CIVIL ENGINEERS 3788 McCRAY STREET RIVERSIDE, CALIFORNIA (714) 686-1070	STORM DRAIN PLAN & PROFILE CITY OF LAKE ELSINORE COLLIER AVENUE	15 OF 21 SHEETS
	DATE: 1-26-91 REGISTERED CIVIL ENGINEER NO. 41914	SCALE: HORIZ.: 1"=40' VERT.: 1"=4'	BENCH MARK: SEE SHEET 2	FILE NO. 89-335.A
	THESE PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.	DRAWN BY: R.C.		
	WILLIAM N. BASHAM R.C.E. 38339 CITY ENGINEER	DESIGNED BY: R.C.		
		CHECKED BY:	W.O. 89-335 FOR: F.B.	

RIVERSIDE BLUEPRINT • RIVERSIDE, CALIF.

STORM DRAIN ACROSS COLLIER AVE. - 111(0,180) PP: 89335 056 23-Oct-90 08:08 RM_7 89-335-1

SHEET 19 OF 24 SHEETS

DRAWING NUMBER 91-386

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER OTSAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER OTSAR

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER OTSAR

CONST. 190.00 L.F. OF 6'x3' RCB PER CALTRANS STD. D80

60 L.F. TRANSITION STRUCTURE FROM 6'x3' RCB TO 6' TRAP. CHANNEL SS=1½:1 PER RCFC STD. CH 329 STEEL SCHEDULE ON SHT. 15

CONST. 822.69 L.F. OF CONC. TRAP. CHANNEL PER SEC. "N-N" THIS SHT. & RCFC & WCD STD. CH 326

20 L.F. TRANSITION FROM 6'WIDE 8'DEEP TRAP. CHANNEL TO 6' WIDE, 2' DEEP TRAP. CHANNEL

172.69 L.F. TRAP. CHANNEL S=6', D=2 SS=1:1.5 PER RCFC STD. CH326

END CHANNEL

1270

1260

1250

0+90.00 CONST. BOX CULVERT PARAPET PER CALTRANS STD. D-73

1+00.00 BC

S=0.021 TC

5.5% FC

5.0% FC

2+68.08 EC

2+80.00 BEG. T.S. NO. 1

3+40.00 END T.S. NO. 1

4+36.07 UNDER SIDEWALK DRAIN

8+32.76 BC

8+28.76 EC

8+68.43 BC

9+10.10

9+60.10

10+89.75 EC

11+62.69

EXIST. GROUND

TOP OF CHANNEL

FHGL

S=0.0071

S=0.0362

GRADE TO DRAIN

LINE B-C 36" R.C.P. SEE SHT. 17

S=0.0168

HGL

S=0.0168

12+60.00 FF

EXIST. GROUND

1270

1260

Q=46 CFS V=11.1 FPS

4.5' R/W 4'

VARIES

EASEMENT BOUNDARY

MATCH EXIST.

2%

6.5' 3' 3' 3.5' 1'

2:1 MAX

1½ 1½

3'

4" CONC.

SECTION "N-N"

HOR. 1"=4' VERT. 1"=2'

LIGHT CL RIP-RAP S=0.005

EXIST. 8"W

4' CUT-OFF WALL

FILTER BLANKETS SEE DETAIL 3 ON SHT. 14

CONC. SILL 1' THICK

8" SEWER FROM MH @ 1249.26 TP

10" SEWER FROM MH @ 1249.28 TP

Q=124.5 CFS V=10.0 FPS

Q=124.5 CFS V=11. FPS

12+51.50 FL

8+76.00 CONST. 15" RCP (ATTAIN MIN. 3.0% S)

Q=69 CFS V=11.9 FPS

LINE 8

1" = 40'

APPROVED BY CITY OF LAKE ELSINORE FOR CALTRANS ENCROACHMENT PERMIT ONLY

3-11-91

ST. STA. 51+37.40 = LINE 8 STA. 11+23

5' SWALE SEE DETAIL SHT. 2

DRAINAGE EASEMENT

2+80.00 BEG. TRANSITION & END 6'x3' RCB

2+68.08 EC

3+40.00 END TRANSITION & BEG. CONC. TRAP CHANNEL

ST. STA. 51+40.00 MODIFIED UNDER SIDEWALK DRAIN PER STD. NO. 309 STA. 4+36.07 TO CONNECT TO LINE 8 12.50 FL

SCALE: 1" = 40'

TOP OF SLOPE

TOP OF CHANNEL

DRAINAGE EASEMENT BOUNDARY

N 56°51'30" W

1055.33

N 46°51'59" W

EXIST. 12" W PROP. 24" W

EXIST. 8"S

20' JOINT 24" RCP LAID UNDER AND BURIED

140.00 BC

R/W

ST. STA. 51+25.00 = 60' RT. = S.D. STA. 0+90.00

CONST. WINGWALL PER CALTRANS D-84 H=8.0' M=10' ELEV a=1235.20 @ 45°

10.6'

34'x53' DRAINAGE EASEMENT

CONST. 2G.2'x30' ENERGY DISSIPATOR TYPE PER SAN DIEGO REGIONAL STD. D-40 1-LIGHT CL. RIP-RAP 2' THICK WITH ½"-0 GRAVEL FILTER BLANKET 1.5' THICK (SEE DETAIL 3 ON SHT. 14)

ST. STA. 51+00 ℄ OF MODIFIED UNDER SIDEWALK DRAIN PER DETAIL ON SHT. 15 & COUNTY STD. NO. 309

COLLIER AVENUE

STORM DRAIN LINE 8

SCALE FEET 40 20 0 40 80

GRADE THE AREA TO DIRECT FLOWS INTO COLLECTING CHANNEL

2:1 SLOPE PLACE ½ TON RIP RAP 3' THICK, 5' HIGH TO PROTECT SLOPE

DRAINAGE EASEMENT

TEMPORARY SWALE-GRADE TO DRAIN

PROPOSED CURB AND GUTTER BY OTHERS

ELEVENTH STREET

LINE 8-C 18" R.C.P. SEE PROFILE SHT. 17

29 CFS

Gr 66 INV.

EXIST 2-24" CMP TO BE REMOVED

PRECAST CONC. FLARED END SECTION, TYPE B PER CALTRANS STD. D94

CONST. HEADWALL PER CALTRANS STD. D-94

RIVERSIDE DRIVE

EXIST 16" W

AS BUILT (ADDENDUM NO. 1)

CALTRANS PERMIT NO. 08-09-N-MC-1929

91-386

REGISTERED PROFESSIONAL ENGINEER HONG-SENG CHIANG No. CO41814 Exp. 3-31-92 CIVIL STATE OF CALIFORNIA

CURVE DATA				
NO.	Δ	R	L	T
①	04°22'37.57"	1267.00	96.03'	48.04'
②	04°22'37.57"	1143.00	87.32'	43.68'
③	30°40'44.23"	199.00	106.55'	54.59'
④	90°00'00"	107.00	168.07'	107.00'

REVISIONS:
1. REVISE CHANNEL DEPTH FROM CHANNEL STA. 9+70 TO STA. 11+62.69 REF B-22-91
2. REVISE DRAINAGE EASEMENT WIDTH, REVISE LINE 8 WINGWALL HEIGHT REF B-22-91

APPROVED BY: Hong-Seng Chiang
REGISTERED CIVIL ENGINEER NO. 41914
DATE: 1-24-91

THESE PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.

WILLIAM H. BASHAM R.C.E. 28939 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE HORIZ.: 1"=40' VERT.: 1"=4'
DRAWN BY: R.C.
DESIGNED BY: R.C.
CHECKED BY:

BENCH MARK: SEE SHEET 1

STORM DRAIN PLAN & PROFILE
CITY OF LAKE ELSINORE
COLLIER AVENUE
LINE 8

W.O. 89-335 FOR: F.B.

16 OF 21 SHEETS
FILE NO. 89-335.A

RIVERSIDE BLUEPRINT - RIVERSIDE, CALIF.

TODD END 951 - 111.10 (AUTOCAD R9335 951 24-JAN-91 02:24 PM) 89-335-1

SHEET 16 OF 24 SHEETS

DRAWING NUMBER 91-387

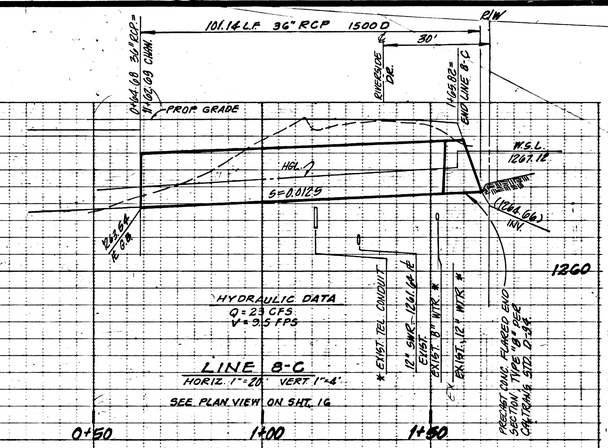
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
RECORDED BY NUMBER 070581

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
RECORDED BY NUMBER 070581

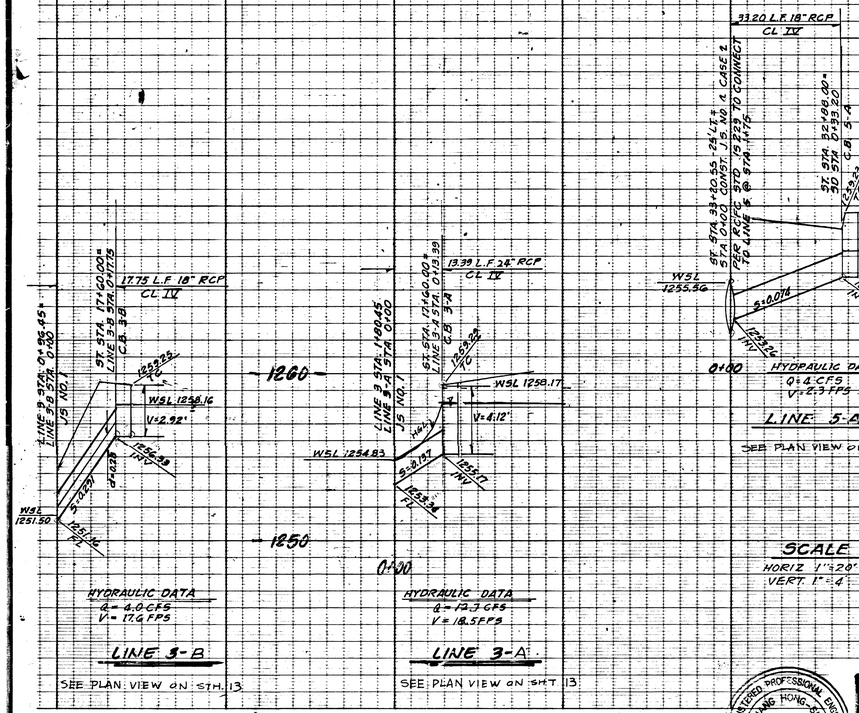
DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
RECORDED BY NUMBER 070581



BEDDING NOTE

PIPE WITH LESS THAN TWO FEET OF COVER SHALL CONFORM TO LOS ANGELES COUNTY FLOOD CONTROL DISTRICT STD. DWGS. 2-D213-3 AND 2-D177 FOR CONCRETE BACKFILL IN TRENCHES, ALL OTHER PIPE SHALL CONFORM TO R.C.K.C. & W.C.U. STD. DWG. M-315



SCALE
HORIZ 1"=20'
VERT. 1"=4'

AS BUILT

REGISTERED PROFESSIONAL ENGINEER
CHANG HONG-SUNG
No. CO41914
Exp. 3-31-92
CIVIL
STATE OF CALIFORNIA

REVISIONS	APPROVED BY:	ALBERT A. WEBB ASSOCIATES CIVIL ENGINEERS	STREET PLAN & PROFILE CITY OF LAKE ELSINORE COLLIER AVENUE CATCH BASIN CONNECTING PIPE PROFILES	17 OF 21 SHEETS
	DATE: 1-26-91	RIVERSIDE CALIFORNIA		FILE NO. 89-335.A
	"89" PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.	SCALE: SEE ABOVE DRAWN BY: DESIGNED BY: R.C. CHECKED BY:	BENCH MARK: SEE SHEET 2	W.O. 89-335 FOR: F.B.
	WILLIAM R. BASHAM R.C.E. 24538 CITY ENGINEER			

DRAWING NUMBER 91-388

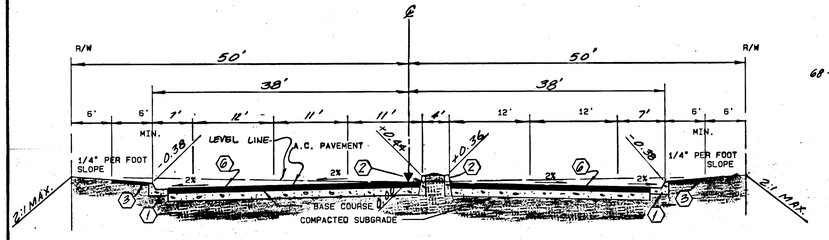
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07041

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07041

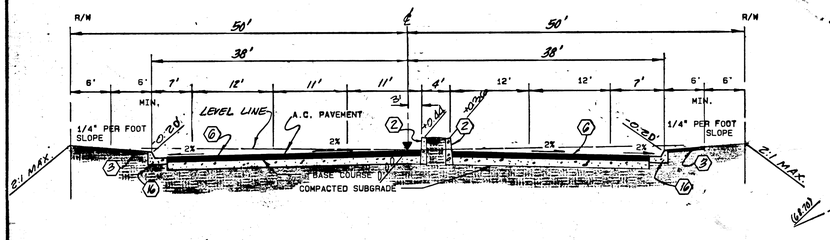
DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07041



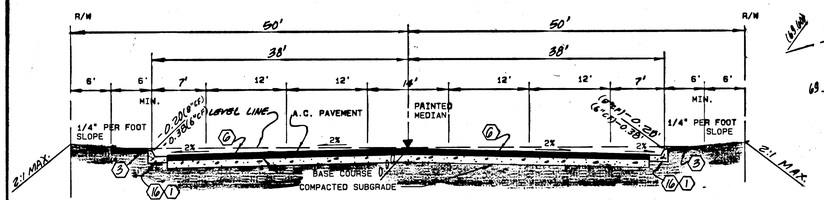
COLLIER AVENUE

PER RIVERSIDE COUNTY STANDARD NO. 101
4' WIDE RAISED OFFSET MEDIAN W/6" CURB
NOT TO SCALE
▼- ELEVATION "A" SHOWN ON PROFILES



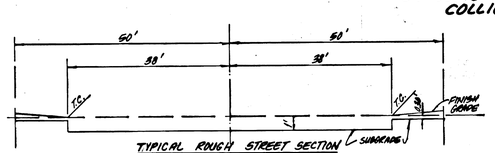
COLLIER AVENUE

PER RIVERSIDE COUNTY STANDARD NO. 101
4' WIDE RAISED OFFSET MEDIAN W/6" CURB
NOT TO SCALE
▼- ELEVATION "A" SHOWN ON PROFILES



COLLIER AVENUE

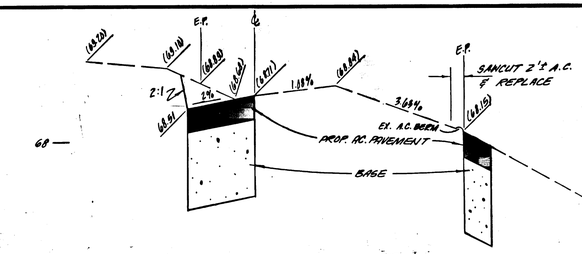
PER RIVERSIDE COUNTY STANDARD NO. 101
NO RAISED MEDIAN
NOT TO SCALE
▼-ELEVATION "A" SHOWN ON PROFILES



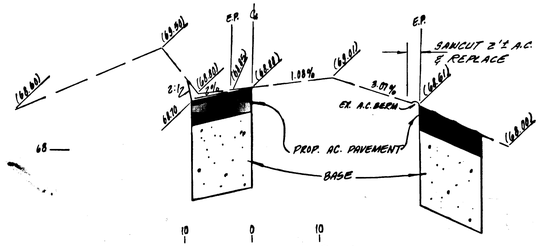
BENCH MARK

U.S.C.& G.S. B.M., STANDARD DISK STAMPED " E 307 1935 " U.S.C.& G.S. DESGINATION E 307 LOCATED 1.9 MILES NORTH ALONG HIGHWAY 74 FROM A.T.& S.F. RAILWAY STATION AT ELSINORE, RIVERSIDE COUNTY, AT THE JUNCTION OF STATE HIGHWAY 71 LEADING NORTHWEST TO CORONA, 35 YARDS SOUTHWEST OF THE SOUTHWEST CORNER OF A SERVICE STATION IN THE TRIANGLE FORMED BY THE JUNCTION, ON THE A.T.& S.F. RAILROAD RIGHT-OF-WAY, 22 YARDS SOUTHEAST OF THE CROSSING OF THE CORONA HIGHWAY, 37 FEET SOUTHWEST OF THE CENTERLINE OF THE SOUTH LEG OF THE JUNCTION, AND 11 FEET NORTH-EAST OF THE TRACT.

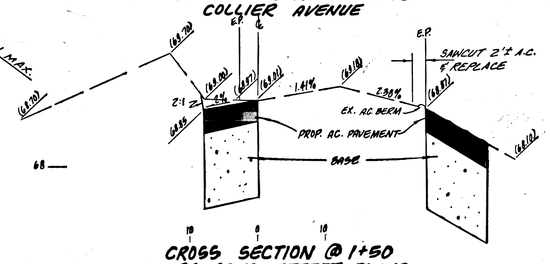
ELEVATION = 1274.882



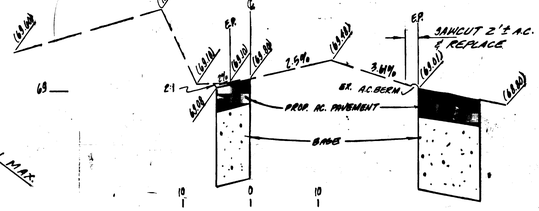
CROSS SECTION @ 0+50
= 62+50.48 STREET PLANS
COLLIER AVENUE



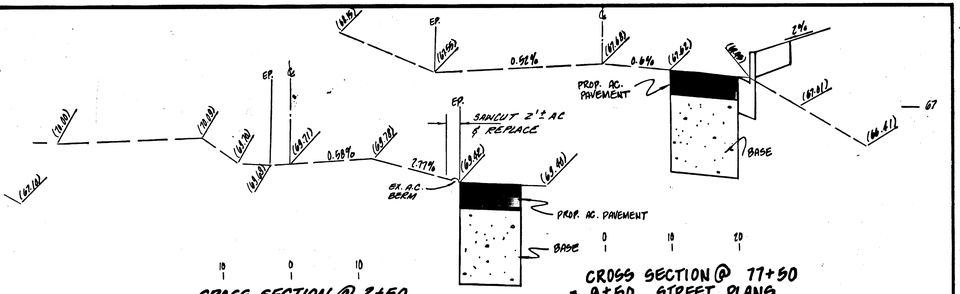
CROSS SECTION @ 1+00
= 63+00.48 STREET PLANS
COLLIER AVENUE



CROSS SECTION @ 1+50
= 63+50.48 STREET PLANS
COLLIER AVENUE

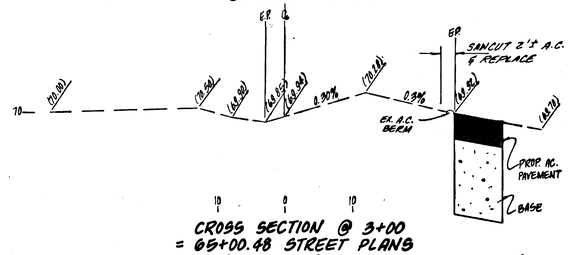


CROSS SECTION @ 2+00
= 64+00.48 STREET PLANS
COLLIER AVENUE

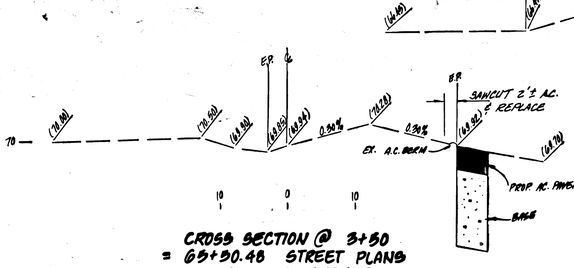


CROSS SECTION @ 2+50
= 64+50.48 STREET PLANS
COLLIER AVENUE

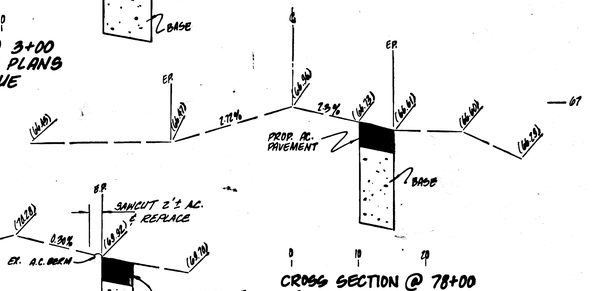
CROSS SECTION @ 77+50
= 9+50 STREET PLANS
RIVERSIDE DRIVE



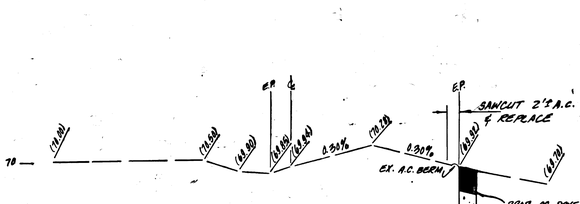
CROSS SECTION @ 3+00
= 65+00.48 STREET PLANS
COLLIER AVENUE



CROSS SECTION @ 3+50
= 65+50.48 STREET PLANS
COLLIER AVENUE

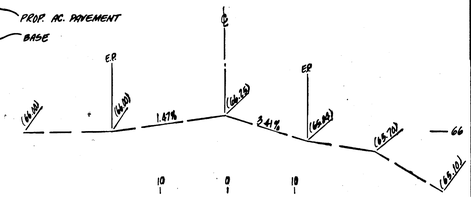


CROSS SECTION @ 78+00
= 9+00 STREET PLANS
RIVERSIDE DRIVE



CROSS SECTION @ 4+00
= 66+00.48 STREET PLANS
COLLIER AVENUE

CROSS SECTIONS SCALE:
1"=10' · HORIZ.
1"=1' · VERT.



CROSS SECTION @ 78+50
= 8+50 STREET PLANS
RIVERSIDE DRIVE

AS BUILT

REGISTERED PROFESSIONAL ENGINEER
CHIANG HONG-SUNG
NO. C41914
EXP. 3-31-92
CIVIL
STATE OF CALIFORNIA

THESE PLANS HAVE BEEN REVIEWED FOR COMPLIANCE WITH THE APPROPRIATE CONDITIONS OF DEVELOPMENT AND / OR CITY AND STATE LAWS, AND HAVE BEEN FOUND ACCEPTABLE.

REVISIONS:
A. ADD CROSS SECTIONS FOR SOUTH END OF COLLIER AVE. & INTER. OF COLLIER & RIVERSIDE. PCT 8-22-91

APPROVED BY: Hong-Sung Chiang
REGISTERED CIVIL ENGINEER NO. C41914
DATE: 4/26/91

THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.
WILLIAM H. BRAHAM R.C.E. 20597 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: AS SHOWN
DRAWN BY: T.L.L.
DESIGNED BY: R.C.
CHECKED BY: R.C.

BENCH MARK:
SEE UPPER LEFT

STREET PLAN & PROFILE
CITY OF LAKE ELSINORE
COLLIER AVENUE
DETAIL SHEET

W.O. 89-335 | FOR: | F.B.

18
OF 21 SHEETS
FILE NO. 89-335.A

CROSS S...NS SHEET 18 COLLIER AVE. - 129[0,180]PF: 89335 1114 26-Apr-91 01:11 PM / 89-335-1

DRAWING NUMBER 91-389

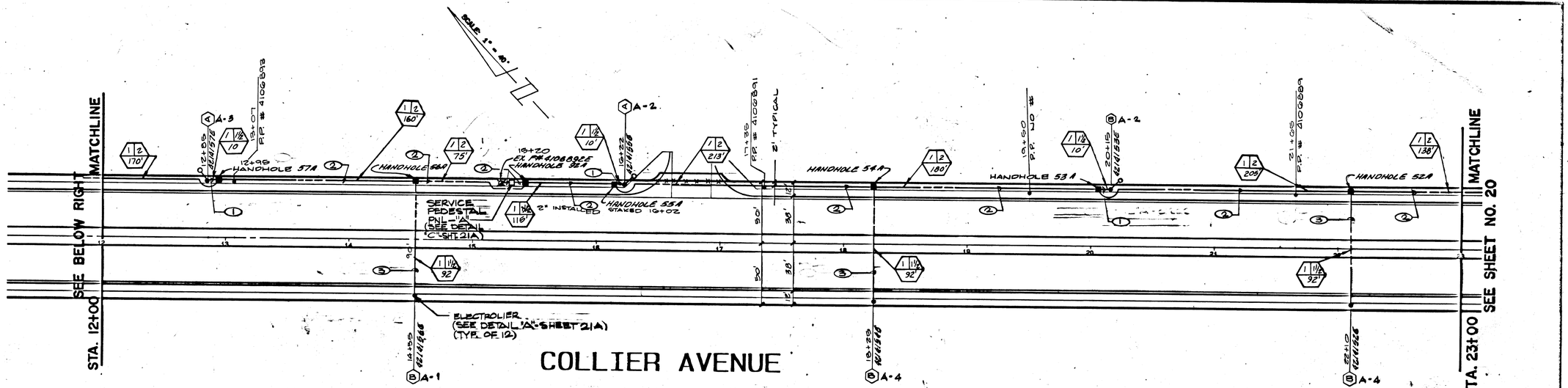
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA

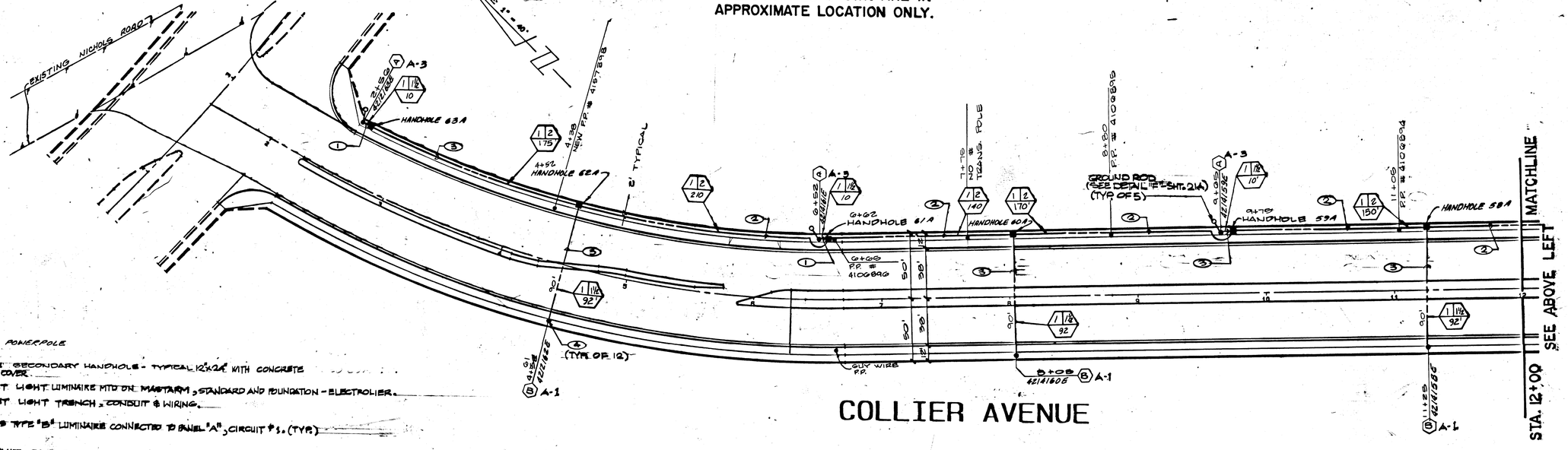
DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA





NOTE:

ALL UTILITIES SHOWN ARE IN APPROXIMATE LOCATION ONLY.

SPECIAL NOTES:

1. 2#10 & 1#10GND, COPPER, TYPE THWN (TYPICAL)
2. 3#6 & 1#8GND
3. 2#6 & 1#8GND
4. 2#10 & 1#10GND BETWEEN POLE'S HANDHOLE & LIGHTING FIXTURE

LEGEND

- EXIST. POWERPOLE
- CONCRETE SECONDARY HANDHOLE - TYPICAL 12"X24" WITH CONCRETE BOLTED COVER.
- STREET LIGHT LUMINAIRE MTD ON MASTARM, STANDARD AND FOUNDATION - ELECTROLIER.
- STREET LIGHT TRENCH, CONDUIT & WIRING.
- (B) A-1 INDICATES TYPE "B" LUMINAIRE CONNECTED TO PANEL "A", CIRCUIT #1. (TYP.)
  - SIZE
  - CONDUIT CALLOUT
  - LENGTH
  - QUANTITY
- GROUND ROD WITH CLAMP AND GROUND WIRE

REGISTERED PROFESSIONAL ENGINEER CHUANG HONG-SUNG NO. C41914 EXP. 3-31-92 CIVIL STATE OF CALIFORNIA

SCALE FEET 40 30 20 10 0 40 80

AS BUILT

REVISIONS:	APPROVED BY:	ALBERT A. WEBB ASSOCIATES	STREET LIGHTING PLAN CITY OF LAKE ELSINORE COLLIER AVENUE STA. 0+00 TO STA. 23+00	19 OF 21 SHEETS
1. REVISE WIRE LAYOUT, LENGTHS & HANDHOLE LOCATIONS RCE 8-22-91	DATE: 5/30/91 REGISTERED CIVIL ENGINEER NO. 41914	CIVIL ENGINEERS 3788 McCRAY STREET RIVERSIDE, CALIFORNIA (714) 686-1070		FILE NO. 89-335-A
2. COMPLETE STREET LIGHTING SYSTEM BY CONTRACTOR RCE 10-22-91	THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.	SCALE: 1"=40' DRAWN BY: D.R.Z. DESIGNED BY: CHECKED BY: R.C.	BENCH MARK: SEE SHEET 1	
	WILLIAM H. BASHAM R.C.E. 28939 CITY ENGINEER	W.O. 89-335 FOR: F.B.		

COLLIER AVE, 40' STREET STRIPING - 111[0,180].PP; 89335 1109 29-May-91 11:02 AM / 89-335-1

DRAWING NUMBER 91-390

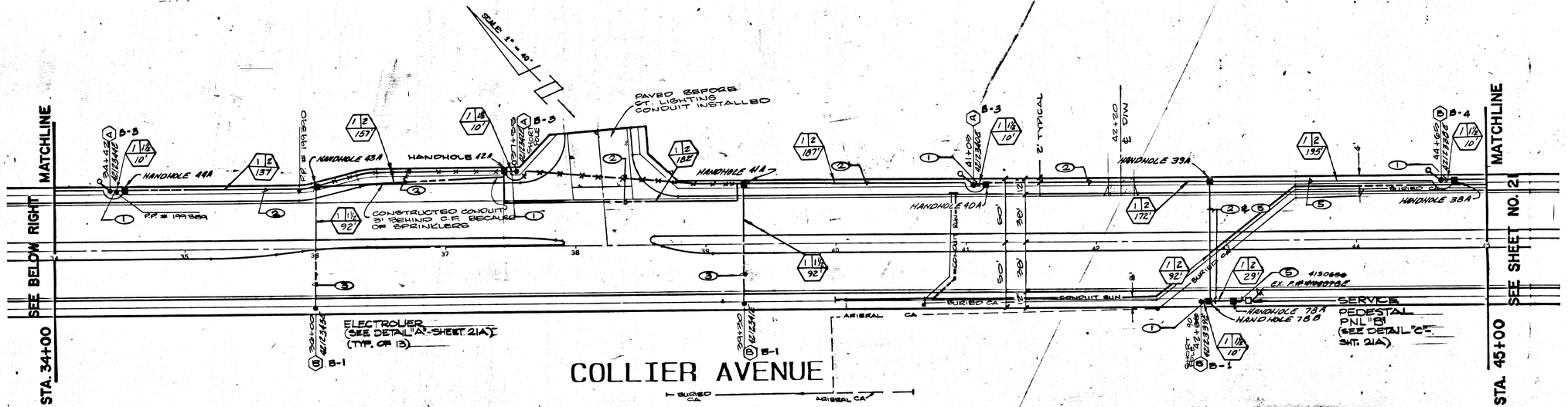
PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 0734R

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 0734R

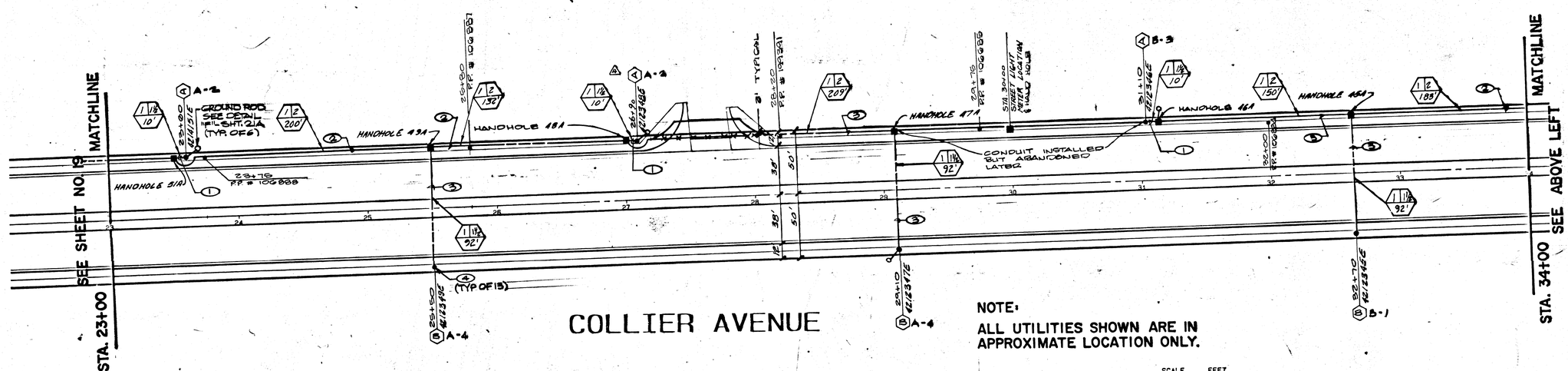
DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 0734R



SPECIAL NOTES:

1. 2#10 & 1#10GND, COPPER, TYPE THWN
2. 3#6 & 1#8GND
3. 2#6 & 1#8GND
4. 2#10 & 1#10GND BETWEEN POLE'S HANDHOLE & LIGHTING FIXTURE.
5. 3#4 & 1#8GND, COPPER, TYPE THWN
6. 2#4 & 1#8GND



NOTE:
ALL UTILITIES SHOWN ARE IN APPROXIMATE LOCATION ONLY.

SCALE FEET
40 30 20 10 0 40 80

AS BUILT

REGISTERED PROFESSIONAL ENGINEER CHUNG HONG-SHIK NO. C41914 EXP. 3-31-92 CIVIL STATE OF CALIFORNIA

REVISIONS:
1. REVISE WIRE LAYOUT, LENGTHS, & HANDHOLE LOCATIONS. RCT 8-22-91
2. COMPLETE STREET LIGHTING SYSTEM BY CONTRACTOR RCT 10-22-91
3. MOVE ST. LIGHT FROM STA. 27+10 TO 26+70 RCT 6-5-92

APPROVED BY: Hong-Shik Chung
REGISTERED CIVIL ENGINEER NO. 41914
DATE: 5/30/91

THESE PLANS HAVE BEEN EXAMINED, AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.
WMB
WILLIAM M. BASHAM R.C.E. 28939 CITY ENGINEER

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 686-1070

SCALE: 1"=40'
DRAWN BY: D.R.Z.
DESIGNED BY:
CHECKED BY: R.C.

BENCH MARK: SEE SHEET NO. 1

STREET LIGHTING PLAN
CITY OF LAKE ELSINORE
COLLIER AVENUE
STA. 23+00 TO STA. 45+00

W.O. 89-335 | FOR: | F.B.

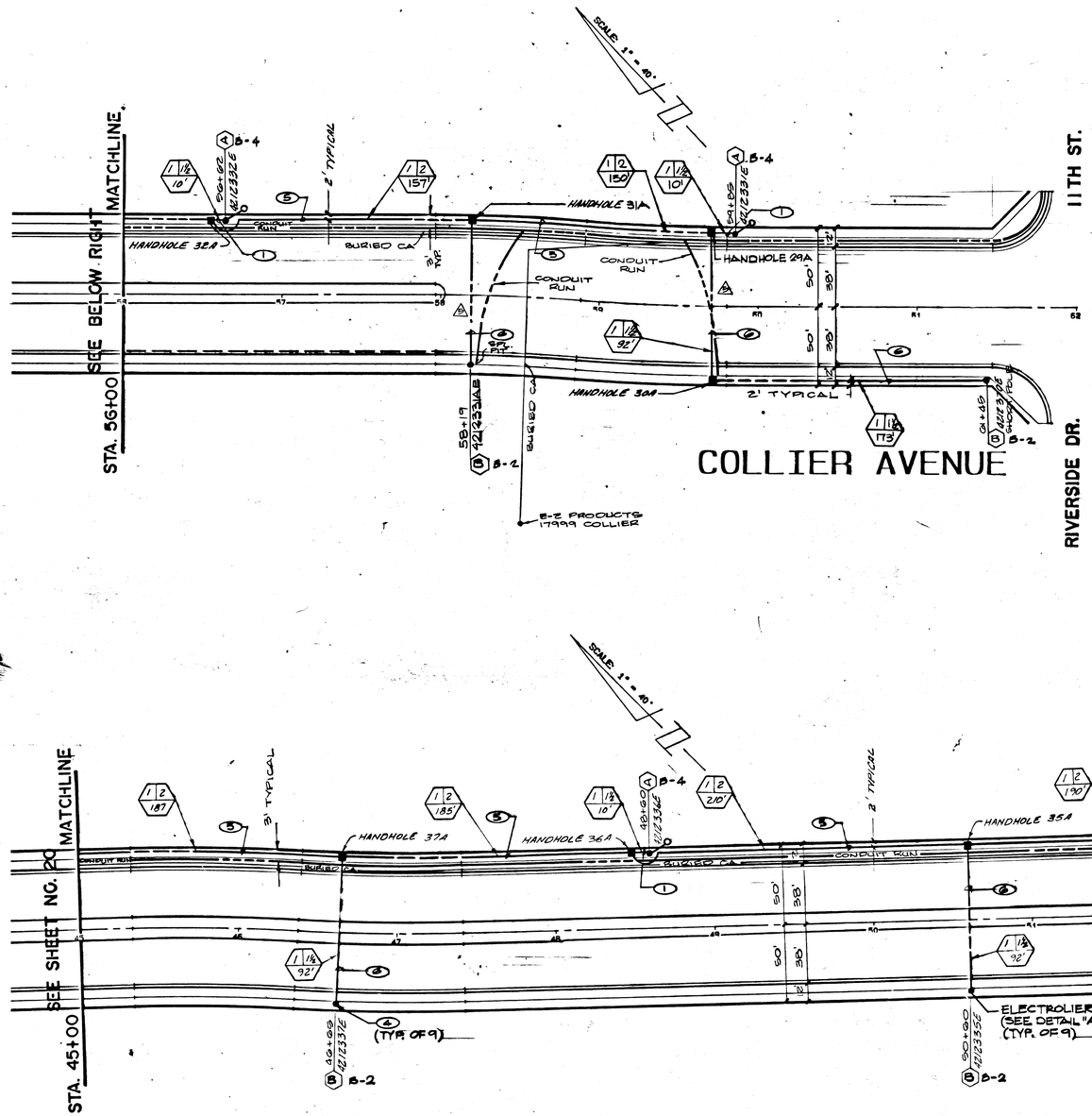
20 OF 21 SHEETS
FILE NO. 89-335-A

DRAWING NUMBER 91-391

DRAWING NUMBER

DRAWING NUMBER

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA



SPECIAL NOTES:

1. 2#10 & 1#10 GND, COPPER, TYPE THWN
4. 2#10 & 1#10 GND BETWEEN POLE'S HANDHOLE & LIGHTING FIXTURE.
5. 3#4 & 1#8 GND, COPPER, TYPE THWN
6. 2#4 & 1#8 GND

NOTE:
ALL UTILITIES SHOWN ARE IN APPROXIMATE LOCATION ONLY.

SCALE FEET
40 30 20 10 0 40 80

AS BUILT

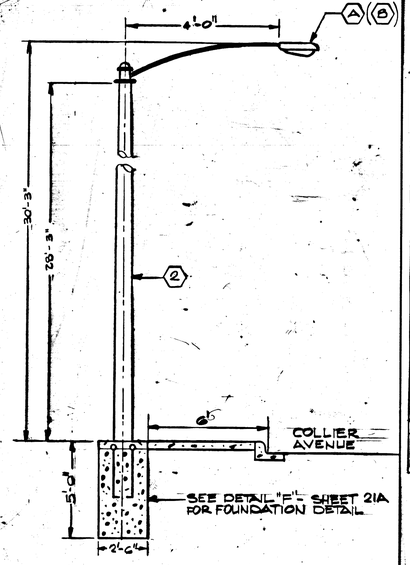
REGISTERED PROFESSIONAL ENGINEER CHUANG HONG-SHING NO. C41914 EXP. 3-31-93 CIVIL STATE OF CALIFORNIA

REVISIONS:	APPROVED BY: Hong-Shing Chuang	ALBERT A. WEBB ASSOCIATES	STREET LIGHTING PLAN
⚠ REVISE WIRE LAYOUT, LENGTHS & HANDHOLE LOCATIONS RT 8-22-91	REGISTERED CIVIL ENGINEER NO. 41914	CIVIL ENGINEERS 3788 McCRAY STREET RIVERSIDE, CALIFORNIA (714) 686-1070	CITY OF LAKE ELSINORE
⚠ COMPLETE STREET LIGHTING SYSTEM BY CONTRACTOR. RT 10-22-91	DATE: 5/30/91		COLLIER AVENUE
⚠ AS BUILT/RECORD DATA	THESE PLANS HAVE BEEN EXAMINED AND THEY ARE IN ACCORDANCE WITH THE CONDITIONS OF DEVELOPMENT, CITY ORDINANCE, AND STATE OF CALIFORNIA LAWS, AND A PERMIT TO CONSTRUCT MAY BE ISSUED.	SCALE: 1"=40'	STA. 45+00 TO STA. 62+00
	WILLIAM H. BASHAM R.C.E. 28434 CITY ENGINEER	DRAWN BY: D.R.Z.	BENCH MARK: SEE SHEET NO. 1
		DESIGNED BY:	W.O. 89-335 FOR: F.B.
		CHECKED BY: R.C.	

21 OF 21 SHEETS
FILE NO. 89-335-A

DRAWING NUMBER 91-392

PLAN HOLD CORPORATION • IRVINE, CALIFORNIA
REORDER BY NUMBER 07048
REVISIONS
A COMPLETE STREET LIGHTING SYSTEM BY CONTRACTOR 10-30-91



* FOR LIGHTS LOCATED AT STA. 37+55, STA. 42+80, AND STA. 61+48 THE POLE HEIGHT IS 33'-3" AND THE MOUNTING HEIGHT IS 28'-3".

ELECTROLIER

SCALE NONE (A)

LIGHTING FIXTURE SCHEDULE

SYMBOL	TYPE	DESCRIPTION	INPUT VA	LAMPS NO.	LAMPS WATTS	LAMPS TYPE	MOUNTING	MANUFACTURER & CAT. NO.	REMARKS
●	A	ROADWAY LUMINAIRE W/CUT OFF OPTICS COMPLETE WITH A PREWIRED INTEGRAL REGULATOR BALLAST 120V, 2.1 PLA, ±10% LINE VOLTAGE REGULATION, IES TYPE III OPTICAL ASSEMBLY, LAMP ADJUSTABLE MOGUL BASE SOCKET, REFLECTOR, PE RECEPTACLE, PHOTO ELECTRIC CONTROLER FIBER GASKET & FUSE IN A DIE-CAST ALUMINUM HOUSING W/ELECTROCOAT GRAY PAINT FINISH & EXTERNAL STAINLESS STEEL BAIL LATCH.	264	1	250	HIGH PRESS SODIUM	STREET LIGHT STANDARD	GENERAL ELECTRIC COMPANY TYPE: GE-M4AC203A26MC3IF	
●	B	SIMILAR TO ITEM "A" ABOVE EXCEPT W/EXTERNAL SHIELD	264	1	250	HIGH PRESS SODIUM	STREET LIGHT STANDARD	GENERAL ELECTRIC COMPANY TYPE: GE-M4AC203A26MC3IF WITH ELSHC-MAC	

LIGHTING FIXTURE SCHEDULE

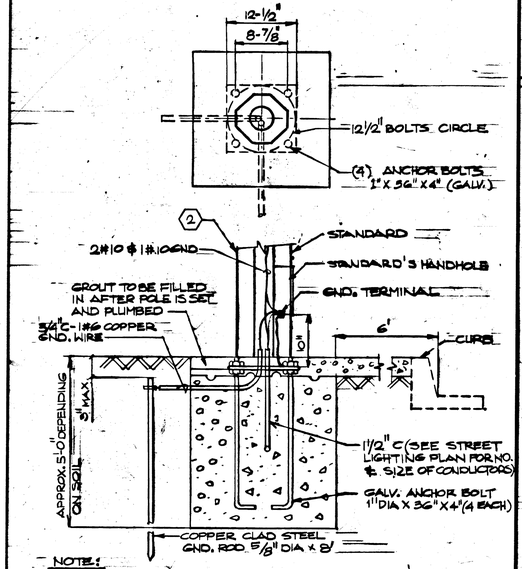
SCALE NONE (B)

MATERIAL SCHEDULE

ITEM NO.	DESIGNATION	DESCRIPTION	MFR./CAT. NO.
1	SERVICE PEDESTAL	UNDERGROUND SERVICE PEDESTAL RATED AT 100A, 120/240 VOLTS IN WEATHER PROOF ENCLOSURE COMPLETE WITH METER SOCKET, MAIN CIRCUIT BREAKER, BRANCH BREAKERS AS SHOWN ON THE DRAWING, COPPER BUSSED CIRCUIT BREAKERS, RIGID SERVICE CULL SECTION, PIANO HINGED DOOR WITH PROVISION FOR PADLOCKING AND METER READING WINDOW WITH PLEXIGLASS COVER.	MYER MEVG M100LVC OR APPROVED EQUAL
2	LIGHTING POLE	PRESTRESSED CONCRETE LIGHTING POLE OCTAGONAL 6" POLE TOP DIA. DESIGNED FOR 80MPH (1.3 GUST FACTOR) COMPLETE WITH ONE 8'-0" TAPERED ALUM. ARM GALVANIZED ANCHOR BOLTS, TAMPERPROOF HANDHOLE COVER.	AMERON 1-C1-28 W F8 ARM

MATERIAL SCHEDULE

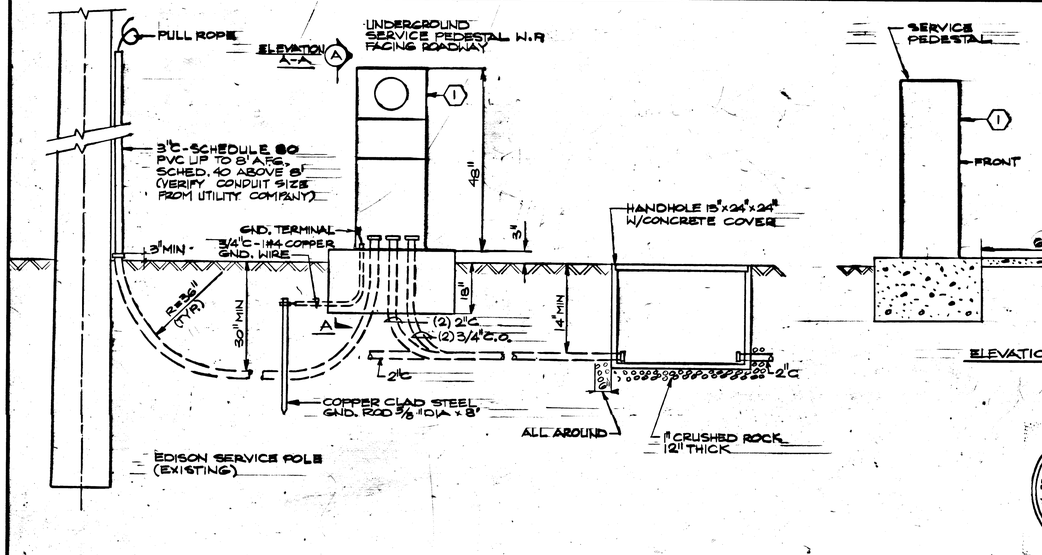
SCALE NONE (D)



NOTE:
1. FOUNDATION SHALL BE INSTALLED AFTER CABLING (FOR UNDERGROUND SERVICE), CURBS AND SIDEWALKS ARE IN PLACE AND GRADES ARE ESTABLISHED.
2. SEE DETAIL "A" - SHEET 21A FOR ELECTROLIER DETAIL.

LTG. STANDARD FOUNDATION DETAIL

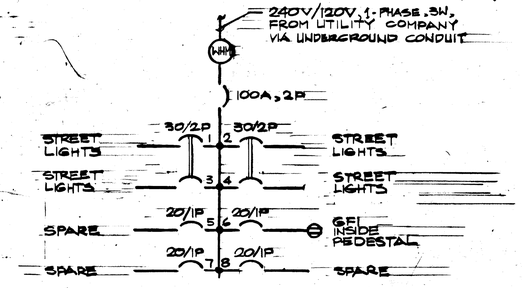
SCALE NONE (F)



REGISTERED PROFESSIONAL ENGINEER
CHANG HONG-SUNG
No. 041914
Exp. 3-31-92
CIVIL
STATE OF CALIFORNIA

SERVICE PEDESTAL

SCALE NONE (C)



SINGLE LINE DIAGRAM-SERVICE PEDESTAL

SCALE NONE (E)

AS BUILT

APPROVED BY: Hong-Sung Chiang
DATE: 10/16/91 REGISTERED CIVIL ENGINEER NO. 41914
APPROVED BY:
DATE: 10-28-91 REGISTERED CIVIL ENGINEER NO. 21887

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CALIFORNIA
(714) 888-1070

SCALE:
DRAWN BY:
DESIGNED BY:
CHECKED BY:
BENCH MARK:

STREET LIGHTING PLAN
CITY OF LAKE ELSINORE
COLLIER AVENUE
MISCELLANEOUS DETAILS

21A
OF 21 SHEETS
DWG. NO. 89-335-A

W.O. | FOR: | F.B.

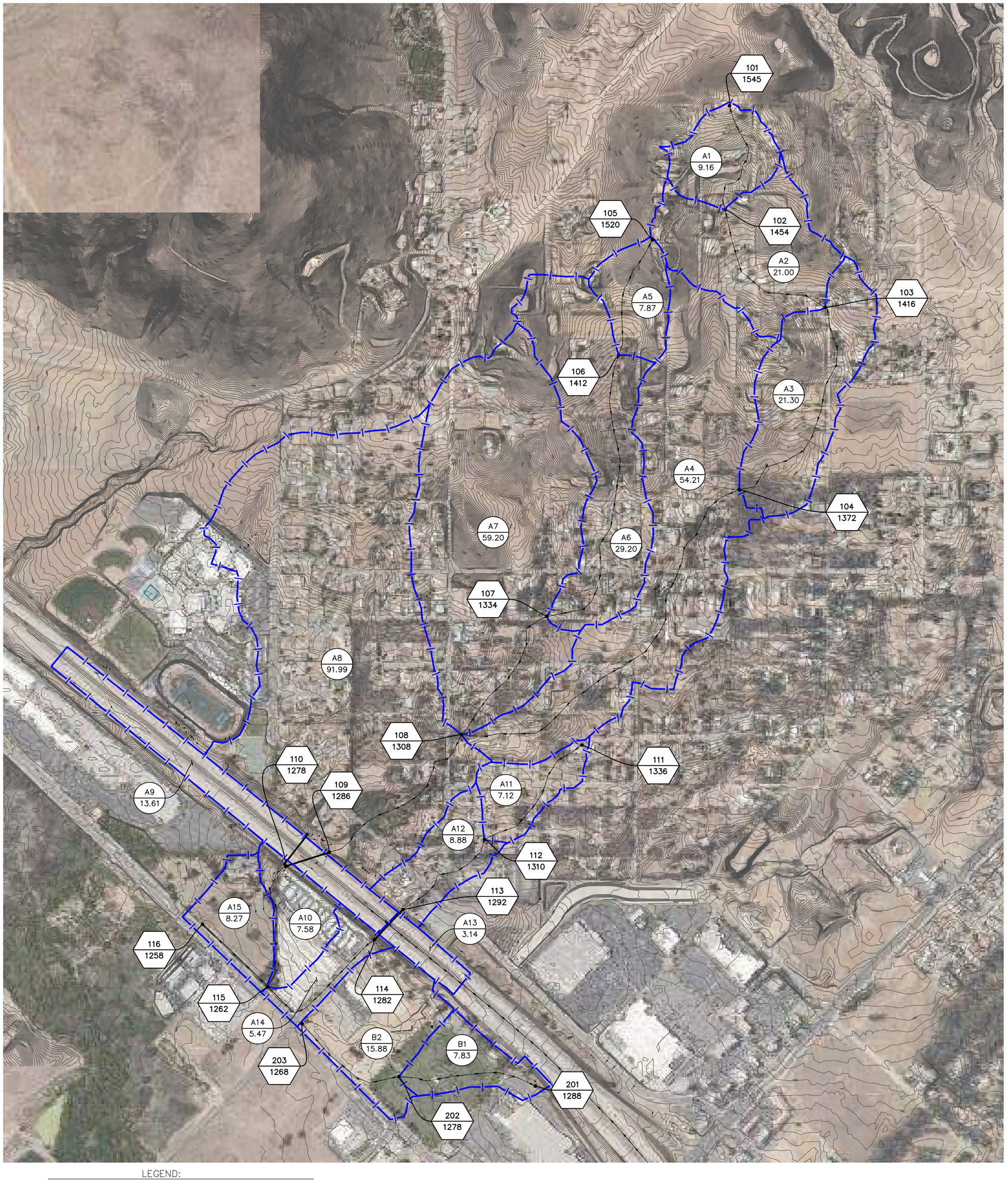
EXHIBITS

EXHIBIT A: PRE-PROJECT RATIONAL METHOD HYDROLOGY MAP

SADDLEBACK INDUSTRIAL

CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

PRE-PROJECT CONDITION HYDROLOGY MAP



LEGEND:

XXX.X / XXXX	NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
*XXXX.X	APPROXIMATE INVERT ELEVATION
XXX / X.X	SUB AREA / ACRES
L=XXX'	FLOW DISTANCE
	FLOW PATH
	WATERSHED BOUNDARY

N

GRAPHIC SCALE
300' 0 150' 300' 600'
1" = 300'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "A"

SADDLEBACK INDUSTRIAL

PRE-PROJECT CONDITION HYDROLOGY MAP

EXHIBIT B: POST-PROJECT ONSITE RATIONAL METHOD HYDROLOGY MAP

SADDLEBACK INDUSTRIAL

IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

POST-PROJECT CONDITION ONSITE HYDROLOGY MAP



LEGEND:

X.X / X.X	NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
XXXX.X	APPROXIMATE INVERT ELEVATION
XXX / X.X	SUB AREA / ACRES
L=XXX'	FLOW DISTANCE
	FLOW PATH
	WATERSHED BOUNDARY

N

GRAPHIC SCALE
60' 0 30' 60' 120'
1" = 60'

EXHIBIT "B"

SADDLEBACK INDUSTRIAL

POST-PROJECT ONSITE HYDROLOGY MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

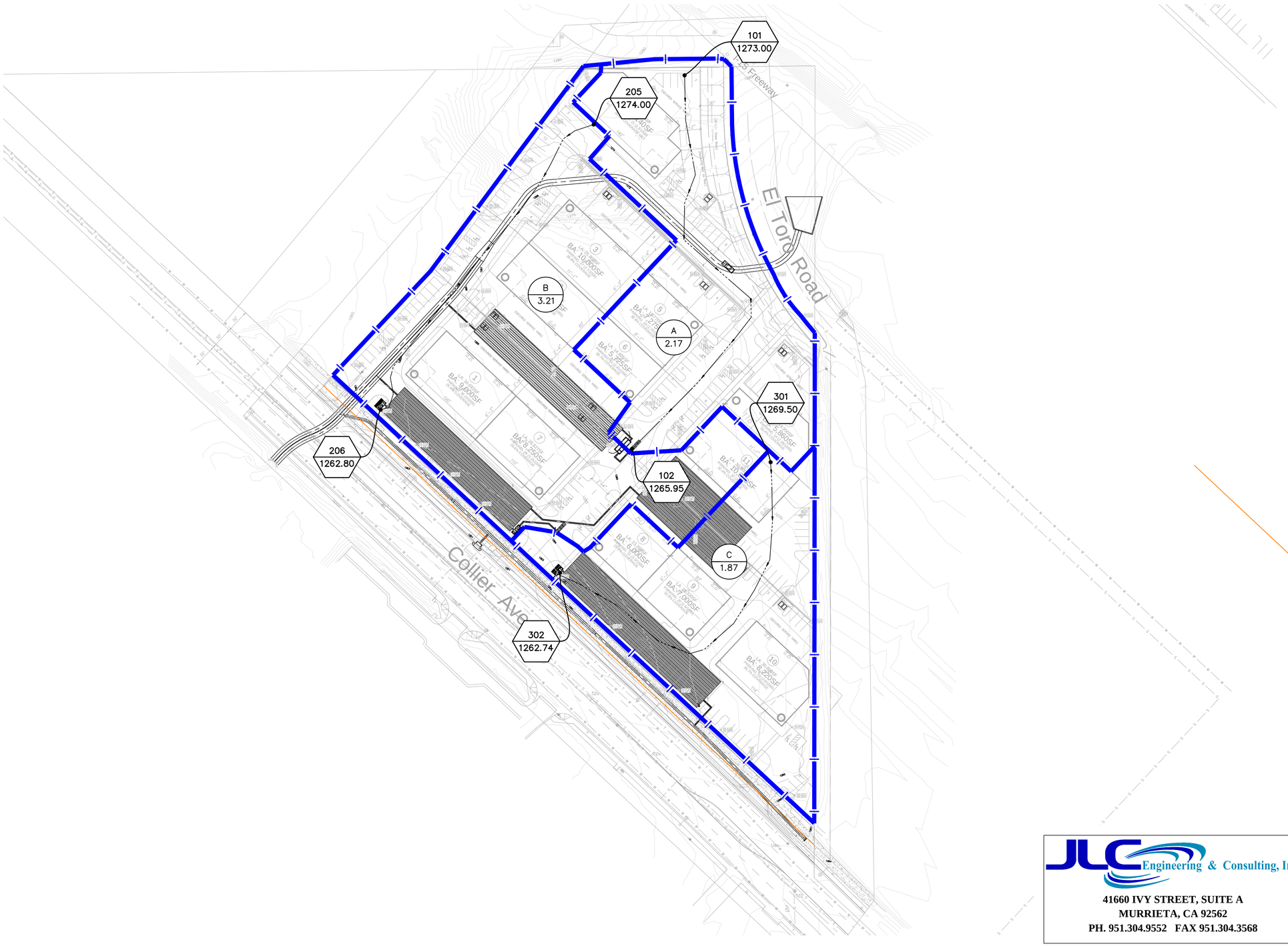
Drawing Name: G:\292.01.20\Engineering\Hydrology_Plan\Exhibits\Onsite Hydrology.dwg
Last Updated: Mar 30, 2021 - 9:47am by jpaver

EXHIBIT C: UNIT HYDROGRAPH WATERSHED MAP

SADDLEBACK INDUSTRIAL

IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

UNIT HYDROGRAPH WATERSHED MAP



LEGEND:

X.X / X.X	NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
XXX / X.X	SUB AREA / ACRES
	FLOW PATH
	WATERSHED BOUNDARY

N

GRAPHIC SCALE
60' 0 30' 60' 120'
1" = 60'

EXHIBIT "C"

SADDLEBACK INDUSTRIAL

UNIT HYDROGRAPH WATERSHED MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

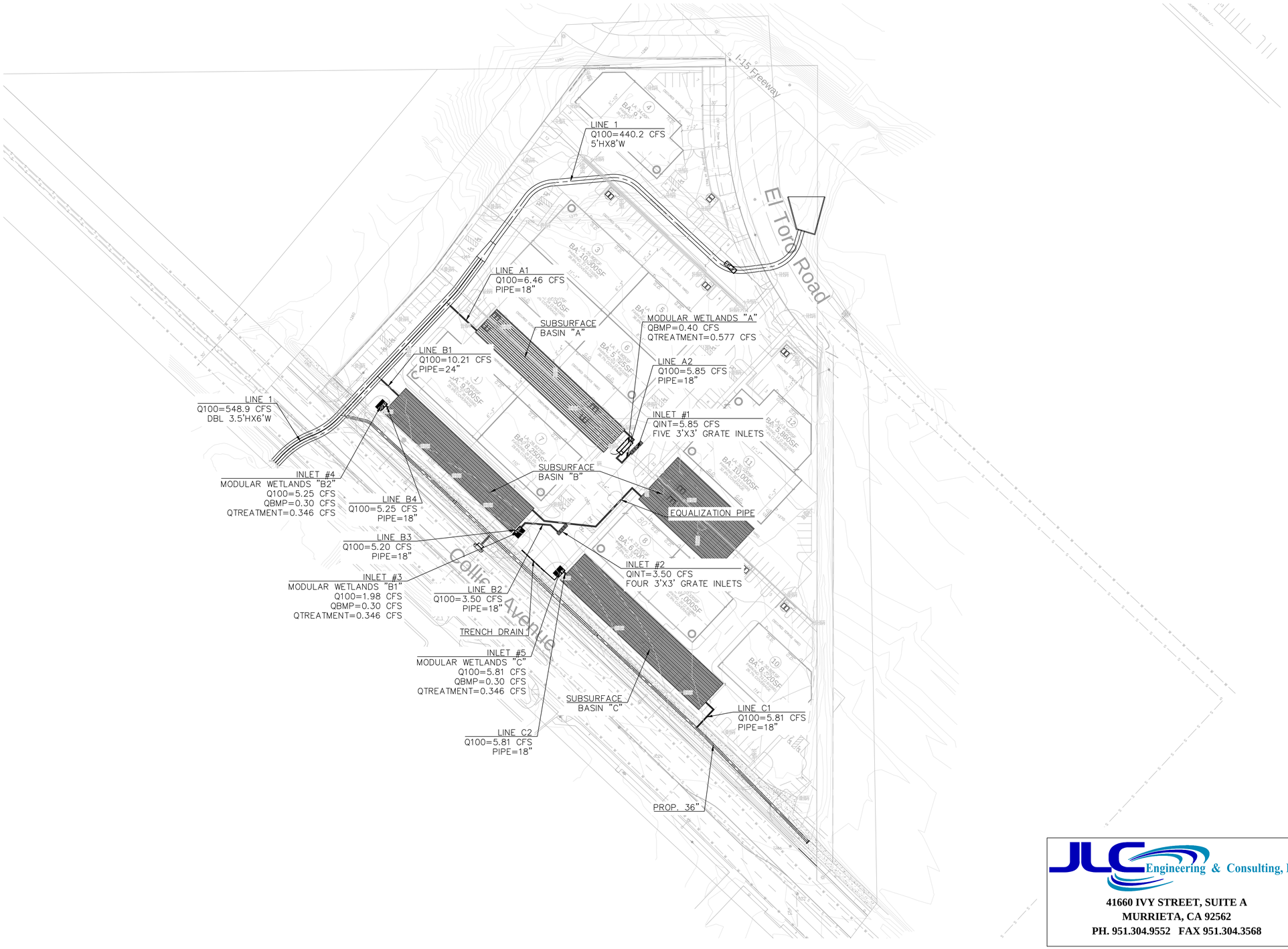
Drawing Name: G:\592.01.20\Engineering\Hydrology_Plan\Exhibits\Unit Hydrograph Watershed Map.dwg
Last Operator: Mar 30, 2021 - 11:43pm Ivy Jaime

EXHIBIT D: DRAINAGE FACILITIES MAP

SADDLEBACK INDUSTRIAL

IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

DRAINAGE FACILITIES MAP



N

GRAPHIC SCALE
60' 0 30' 60' 120'
1" = 60'

EXHIBIT "D"

SADDLEBACK INDUSTRIAL

DRAINAGE FACILITIES MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Drawing Name: G:\262.01.02\Engineering\Hydrology_Plan\Exhibits\Drainage Facilities Map.dwg
Last Opened: Mon, Jan 25, 2021 - 4:06pm By jsover

EXHIBIT E: HYDROLOGIC SOILS MAP

117° 22' 17" W
117° 17' 12" W
33° 46' 16" N
33° 39' 33" N
468000
467000
469000
470000
471000
472000
473000
3734000
3733000
3732000
3731000
3730000
3729000
3728000
3727000
3726000
3725000
Bryan Lee Rd
El Toro Rd
Lawton Blvd
Sumac Rd
La Barranca Rd
Reiss Rd
Maywood Club Rd
Belita Dr
Allec Way
Lindell Rd
Arroyo Del Toro
Santa Rosa Rd
Read St
Walsh Rd
RtF
CkF2
VsD2
VtF2
FcD2
HdD2
FwE2
GyD2
TbF2
VsC
VsD2
CbF2
LpE2
CaD2
HnC
CaC2
LaC
YsC2
TcG
LaD2
FfC2
FaD2
HcC
LcD2
FkD2
FbC2
FwE2
LpF2
CnC
AlC
GP
LpE2
CnC
GdC
VaE3
VeD2
ClC
AlD
ChC
CkD2
GkD
BfD
Irma St
Mauricio St
74
Sharon St
GoB
AkC
RaD3
GaC
GaA
AbF
Wg
AaD
RuF
PlD
PmE
Tp2
PaC2
PaA
Tr2
Ts
VdF2
GdD2
GdA
Tr2
Collier
11th St
Crane St
Dexter
Hunt Ave
Lakeshore
Ryan Ave
Joy St
Wilson
Palm
Trelevan Ave
Chaney
Silver St
Del Norte
Exit 75
Acacia Dr
Graham
Main
N Main St
Alley
J St
Weber St
Bella Vis
Auto Center Dr
Avenue 5
Saddle Ridge Dr
Summerhill
San Jacinto River
Railroad
Diamond
15
Map Scale: 1:15,800 if printed on D portrait (22" x 34") sheet.
Meters
0 200 400 800 1200
Feet
0 500 1000 2000 3000
N
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 Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Western Riverside Area, California
Survey Area Data: Version 13, May 27, 2020

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

Date(s) aerial images were photographed: Apr 17, 2018—Jun 25, 2019

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AaD	Altamont clay, 5 to 15 percent slopes	D	23.3	0.2%
AbF	Altamont cobbly clay, 8 to 35 percent slopes	D	180.6	1.6%
AkC	Arbuckle loam, 2 to 8 percent slopes	C	144.4	1.3%
AkD	Arbuckle loam, 8 to 15 percent slopes	C	85.2	0.8%
AlC	Arbuckle gravelly loam, 2 to 9 percent slopes, dry, MLRA 19	C	439.6	4.0%
AlD	Arbuckle gravelly loam, 8 to 15 percent slopes	C	185.4	1.7%
AlE	Arbuckle gravelly loam, 15 to 25 percent slopes	C	31.0	0.3%
BfD	Bosanko clay, 9 to 15 percent slopes	D	125.8	1.1%
CaC2	Cajalco fine sandy loam, 2 to 8 percent slopes, eroded	C	44.8	0.4%
CaD2	Cajalco fine sandy loam, 8 to 15 percent slopes, eroded	C	69.4	0.6%
CbF2	Cajalco rocky fine sandy loam, 15 to 50 percent slopes, eroded	D	500.7	4.6%
ChC	Cieneba sandy loam, 5 to 8 percent slopes	D	10.9	0.1%
ChD2	Cieneba sandy loam, 8 to 15 percent slopes, eroded	D	13.3	0.1%
CkD2	Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded	D	59.1	0.5%
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded	D	1,319.7	12.0%
ClC	Cortina gravelly loamy sand, 2 to 8 percent slopes	A	94.3	0.9%
CmC	Cortina cobbly loamy sand, 2 to 8 percent slopes	A	83.7	0.8%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CnC	Cortina gravelly coarse sandy loam, 2 to 8 percent slopes	A	133.4	1.2%
CrD	Cortina cobbly sandy loam, 2 to 12 percent slopes	A	4.8	0.0%
EcD2	Escondido fine sandy loam, 8 to 15 percent slopes, eroded	C	12.9	0.1%
FaD2	Fallbrook sandy loam, 8 to 15 percent slopes, eroded	C	69.5	0.6%
FbC2	Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded	D	6.1	0.1%
FcD2	Fallbrook rocky sandy loam, shallow, 8 to 15 percent slopes, eroded	D	3.2	0.0%
FfC2	Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded	C	48.3	0.4%
FkD2	Fallbrook fine sandy loam, shallow, 8 to 15 percent slopes, eroded	D	6.0	0.1%
FwE2	Friant fine sandy loam, 5 to 25 percent slopes, eroded	D	16.2	0.1%
GaA	Garretson very fine sandy loam, 0 to 2 percent slopes	B	110.5	1.0%
GaC	Garretson very fine sandy loam, 2 to 8 percent slopes	B	35.0	0.3%
GdA	Garretson gravelly very fine sandy loam, 0 to 2 percent slopes	B	30.8	0.3%
GdC	Garretson gravelly very fine sandy loam, 2 to 8 percent slopes	B	181.8	1.7%
GdD2	Garretson gravelly very fine sandy loam, 8 to 15 percent slopes, eroded	B	32.7	0.3%
GhC	Gorgonio loamy sand, 0 to 8 percent slopes	A	3.5	0.0%
GkD	Gorgonio loamy sand, channeled, 2 to 15 percent slopes	A	12.9	0.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GoB	Grangeville loamy fine sand, drained, 0 to 5 percent slopes	A/D	6.0	0.1%
GP	Gravel pits		3.8	0.0%
GyD2	Greenfield sandy loam, 8 to 15 percent slopes, eroded	A	2.4	0.0%
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	A	110.8	1.0%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	A	9.5	0.1%
HdD2	Hanford cobbly coarse sandy loam, 2 to 15 percent slopes, eroded	A	1.2	0.0%
HnC	Honcut sandy loam, 2 to 8 percent slopes	A	34.6	0.3%
LaC	Las Posas loam, 2 to 8 percent slopes	D	61.1	0.6%
LaD2	Las Posas loam, 8 to 15 percent slopes, eroded	D	73.7	0.7%
LcD2	Las Posas stony loam, 8 to 15 percent slopes, eroded	D	11.7	0.1%
LpE2	Lodo rocky loam, 8 to 25 percent slopes, eroded	D	291.8	2.7%
LpF2	Lodo rocky loam, 25 to 50 percent slopes, eroded	D	3,531.4	32.1%
PaA	Pachappa fine sandy loam, 0 to 2 percent slopes	B	73.0	0.7%
PaC2	Pachappa fine sandy loam, 2 to 8 percent slopes, eroded	B	4.7	0.0%
PlD	Placentia fine sandy loam, 5 to 15 percent slopes	D	0.2	0.0%
PmE	Placentia cobbly fine sandy loam, 8 to 25 percent slope s	D	6.7	0.1%
RaB2	Ramona sandy loam, 2 to 5 percent slopes, eroded	C	31.4	0.3%
RaD3	Ramona sandy loam, 8 to 15 percent slopes, severely eroded	C	0.0	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
RtF	Rockland		1,117.3	10.2%
RuF	Rough broken land		55.8	0.5%
TbF2	Temescal rocky loam, 15 to 50 percent slopes, eroded	D	555.4	5.1%
TeG	Terrace escarpments		11.1	0.1%
Tp2	Traver loamy fine sand, eroded	B	36.7	0.3%
Tr2	Traver loamy fine sand, saline-alkali, eroded	B	61.4	0.6%
Ts	Traver fine sandy loam, saline-alkali	B	47.3	0.4%
VaE3	Vallecitos loam, 8 to 25 percent slopes, severely eroded	D	100.4	0.9%
VdF2	Vallecitos rocky loam, 8 to 50 percent slopes, eroded	D	17.1	0.2%
VeD2	Vallecitos loam, thick solum variant, 8 to 15 percent slopes, eroded	C	23.9	0.2%
VsC	Vista coarse sandy loam, 2 to 8 percent slopes	B	10.7	0.1%
VsD2	Vista coarse sandy loam, 8 to 15 percent slopes, eroded	B	328.5	3.0%
VtF2	Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded	B	3.6	0.0%
Wg	Willows silty clay, saline-alkali	D	181.8	1.7%
YsC2	Ysidora gravelly very fine sandy loam, 2 to 8 percent s lopes, eroded	C	25.9	0.2%
YsE2	Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, eroded	C	40.2	0.4%
Totals for Area of Interest			**10,989.8**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

EXHIBIT F: RAINFALL MAPS

2 YEAR, 1 HOUR

LAKE ELSINORE
RAINFALL VALUE = 0.58

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973

RCFC & WCD

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

2-YEAR — 1-HOUR PRECIPITATION

PLATE D-4.3

2 YEAR, 24 HOUR

LAKE ELSINORE
RAINFALL VALUE = 2.50

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

NOTES:
Isohyetals from NOAA Atlas 2
Volume XI - California, 1973.

RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CON
AND
WATER CONSERVATION DISTR

2-YEAR — 24-HOU
PRECIPITATION

DRAWN BY: K.A.S.
APPROVED

100 YEAR, 1 HOUR

LAKE ELSINORE
RAINFALL VALUE = 1.45

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Isohyetals based on NOAA Atlas
Volume XI - California, 1973

RCFC & WCD

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

100-YEAR — 1-HOUR
PRECIPITATION

100 YEAR, 24 HOUR

LAKE ELSINORE
RAINFALL VALUE = 6.50

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Isohyetals from NOAA Atlas 2
Volume XI - California, 1973.

RCFC & WCD

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100-YEAR — 24-HOUR PRECIPITATION

DRAWN BY

APPROVED CHIEF ENGINEER R.E. NO. 8823

SLOPE INTENSITY CURVE

LAKE ELSINORE
SLOPE = 0.45

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Slope of Intensity Duration Curve based on district analysis of automatic recording rain gage records

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SLOPE OF INTENSITY DURATION CURVE

DRAWN BY | SHEET NO