



Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

BAY & DAY INDUSTRIAL BUILDING
SOUTHWEST CORNER OF BAY AVENUE AND DAY STREET
MORENO VALLEY, CA
PEN23-0075 (LST23-0024)

PREPARED FOR

MOLTO PROPERTIES, LLC
1 LINCOLN CENTRE
18W140 BUTTERFIELD ROAD, SUITE 750
OAKBROOK TERRACE, IL
PHONE: (949) 226-4601

OCTOBER 5, 2023
REVISED NOVEMBER 7, 2023
REVISED DECEMBER 26, 2023
REVISED JANUARY 29, 2024
REVISED MAY 2, 2024

JOB NO. 3930

PREPARED BY

THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
P. (714) 521-4811
FAX. (714) 521-4173

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

BAY & DAY INDUSTRIAL BUILDING
SOUTHWEST CORNER OF BAY AVENUE AND DAY STREET
PEN21-0123 (LST21-0043)

PREPARED
UNDER THE SUPERVISION OF



A handwritten signature in blue ink, appearing to read "Reinhard Stenzel", written over a horizontal line.

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

INTRODUCTION

A: PROJECT LOCATION

The project site is located on the southwest corner of Bay Avenue and Day Street in the City of Moreno Valley, California. Please see following page for vicinity map.

B: STUDY PURPOSE

The purpose of this study is to determine the 100-year existing condition and proposed condition discharges from the project site, which drains to the Old 215 Frontage Road.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Kristie Ferronato



DISCUSSION

Project Description

The project site encompasses approximately 9.57 acres. Improvements will include a warehouse type building that is approximately 194,775 square feet. There will be a truck yard and trailer parking lot on the west side of the proposed building. Vehicle parking will be located in the east portion of the site. Proposed landscaping will be street adjacent and throughout the site. Landscaping will be street adjacent and along the southerly property line.

Master Plan of Drainage

The site is part of the Line G-G of the Master Plan Project No. 02-8928002, dated December 30, 2004, prepared by AEI CASC Engineering. There are four alternatives for Line G-G. However, Line G-G has not been constructed and does not seem likely in the future. Line G-G drains to an existing system in Old 215 Frontage Road. Instead the City requested the site to flow to the proposed storm drain system in Day Street.

Previous hydrology report and storm drain plans prepared by Thienes Engineering (PEN21-0079 / LST21-0039) tabled a portion of the project site to the storm drain in Day Street and allocated the 100-year peak flow discharge rate of 8.1 cfs. The preliminary, yet not approved, public storm drain plans for PEN21-0079/LST21-0039 are provided in Appendix D.

See Appendix A for Line G-G maps, and other pertinent reference materials.

Existing Off-Site Run-On

The project site receives offsite run-on that is conveyed by an existing 24-inch pipe, Lateral GG-2 Interim Storm Drain, and discharges at the surface via an existing headwall. Flows from Day Street and from the existing residential east of the project site discharge onto the site via this existing storm drain. The offsite 100-year peak flow rate is approximately 8.2 cfs and confluent with the rest of the onsite runoff where it sheet flows southwesterly toward Linda Court and Alessandro Boulevard.

This offsite flow will be intercepted in a proposed storm drain in Day Street with improvements to the project site.

See Appendix A for Lateral GG-2 Interim Storm drain plan and profile, prepared by AEI CASC Engineering.

Existing Condition

The majority of the site is undeveloped and drains southwesterly towards Linda Court. Flows appear to continue southerly and will eventually drain to Alessandro Boulevard. The peak flow rate for the 100-year storm is approximately 9.4 cfs for the larger easterly portion of the site (nodes 100-101). The 100-year peak flow rate for the westerly lot is approximately 1.3 cfs (nodes 110-111).

Please see Appendix B for the existing condition hydrology calculations and Appendix D for the existing condition hydrology map.

Proposed Condition

Off-site run-on that enters the easterly portion of the site from the northeast will be intercepted by a proposed catch basin at Day Street. The existing headwall and existing public catch basin on the west side of Day Street will be removed. A proposed public storm drain, along with a public catch basin, will be constructed along the west side of Day Street in the proposed low spot. This storm drain will connect to the existing lateral from the catch basin along the east side of Day Street. The public storm drain will continue southerly in Day Street and will join the future storm drain in Day Street (PEN21-0079/LST21-0039).

Runoff from the easterly vehicle parking (nodes 100-102), and a portion of the building roof, will drain to catch basins in the parking lot via overland flow. An onsite storm drain, Line A, will convey flows to the north, turn west around the building, and continue south toward the building truck yard. Line A will collect runoff from the building roof, truck yard, and southerly drive aisle along the west side of the building. Stormwater from these areas will surface drain to the several catch basins located in the truck yard (nodes 111 & 121). The westerly 0.73 acres of the site will surface drain to a catch basin and be conveyed via piping to Line A (node 112).

Line A then continues south and turns east along the south of the building to connect with a future storm drain (node 124) in Day Street. The 100-year peak flow rate from the site is approximately 25.4 cfs, un-detained.

Runoff from the northerly driveway and landscaping will surface drain towards Bay Avenue with a 100-year peak flow rate of 1.1 cfs that will drain directly to the street.

See Appendix B for the Proposed Condition Hydrology Calculations and Appendix D for the Proposed Condition Hydrology Map.

Detention

For final design, Riverside County typically requires detention analysis for the 1-hour, 3-hour, 6-hour and 24-hour duration events for the 2-year, 5-year, and 10-year return frequencies. Detention basin and outlet sizing will ensure that none of these storm events

has a higher peak discharge in the post-development condition than in the pre-development condition.

Hydrographs for the above-described events were established for both existing (pre-developed) and proposed (commercial) development conditions. Hydrograph parameters are as follows:

- For the 2-year and 5-year events, the loss rate will be determined using an AMC I condition. For the 10-year event, AMC II was used.
- Undeveloped condition Low Loss=90%
- Basin site Low Loss=10%
- Rainfall values from the Riverside County Hydrology Manual

For preliminary design purposes, sizing may be based on the difference in runoff hydrograph volume between the “developed” condition and the “pre-developed” condition for the 24-hour duration event for the 10-year return frequency.

Hydrographs were established using the area of the project site (site only, no offsite area) for the existing and proposed condition for the 1-hour, 3-hour, 6-hour and 24-hour events for the 10-year storm frequency. The following table summarizes pre- and post-development peak flow rates for the specified 10-year events:

Event	Existing Condition	Proposed Condition	Difference
10-Year 1-hour	14.2 cfs	18.1 cfs	+3.9 cfs
10-Year 3-hour	8.0 cfs	10.6 cfs	+2.6 cfs
10-Year 6-hour	7.0 cfs	9.6 cfs	+2.6 cfs
10-Year 24-hour	1.5 cfs	3.4 cfs	+1.9 cfs

The following table summarizes the volumes for the specified storm events:

Event	Existing Condition	Proposed Condition	Difference
10-Year 1-hour	0.42 ac-ft	0.58 ac-ft	+0.16 ac-ft
10-Year 3-hour	0.44 ac-ft	0.93 ac-ft	+0.49 ac-ft
10-Year 6-hour	0.47 ac-ft	1.25 ac-ft	+0.78 ac-ft
10-Year 24-hour	0.36 ac-ft	2.04 ac-ft	+1.68 ac-ft

From the above table, the largest difference in volume is approximately 1.68 acre-feet. This volume has been provided between the underground storage chambers and the surface of the truck yard.

Per Riverside County and City of Moreno Valley criteria, final design will include 100-year basin routing and show the overall discharge is from the project site is no more than the allocated 8.1 cfs in the 100-year storm event. The difference in volume between existing and proposed condition in all storm events (2-year through 100-year) will be temporarily stored within the project site.

See Appendix “C” for proposed and existing condition hydrographs.

Methodology

Hydrology calculations were computed using Riverside County rational method program (by AES software). The soil type is C per Riverside County Hydrology Manual. AES software was used to calculate all rational method peak flow rates. Hydrographs were computed using CivilD Software.

APPENDIX

DESCRIPTION

A

REFERENCE MATERIAL

B

HYDROLOGY CALCULATIONS

C

DETENTION CACLULATIONS

D

HYDROLOGY MAPS

APPENDIX A

REFERENCE MATERIAL

MASTER DRAINAGE PLAN
LINE GG PRELIMINARY ENGINEERING REPORT
PROJECT NO. 02-89280022

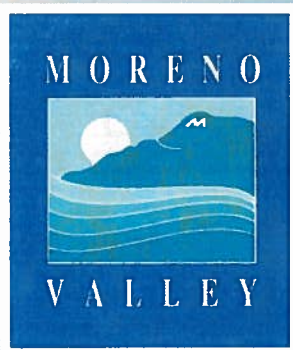
Master Drainage Plan

Line GG Preliminary Engineering Report

Project No. 02-89280022



Submitted to:



Mr. Larry Gonzales
Senior Engineer
Capital Projects Division
14177 Frederick Street
Moreno Valley, CA 92552-0805



Submitted by:

AEI-CASC
ENGINEERING

937 South Via Lata, Suite 500
Colton, CA 92324
(909) 783-0101
(909) 783-0108 (fax)

December 30, 2004

LINE "GG" STORM DRAIN PLANS ALTERNATIVE 1A

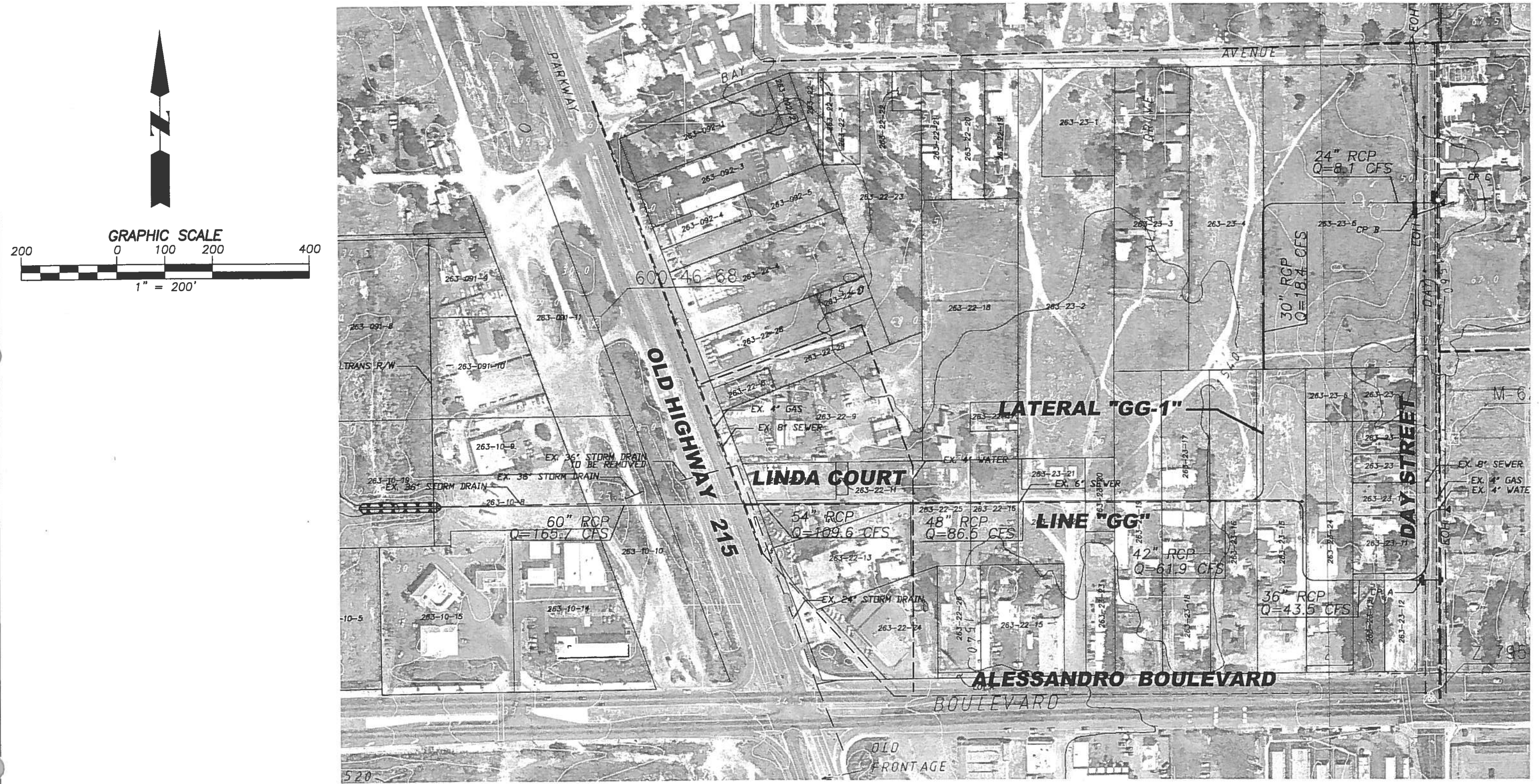


FIGURE 1-1

LINE "GG" STORM DRAIN PLANS ALTERNATIVE 1B

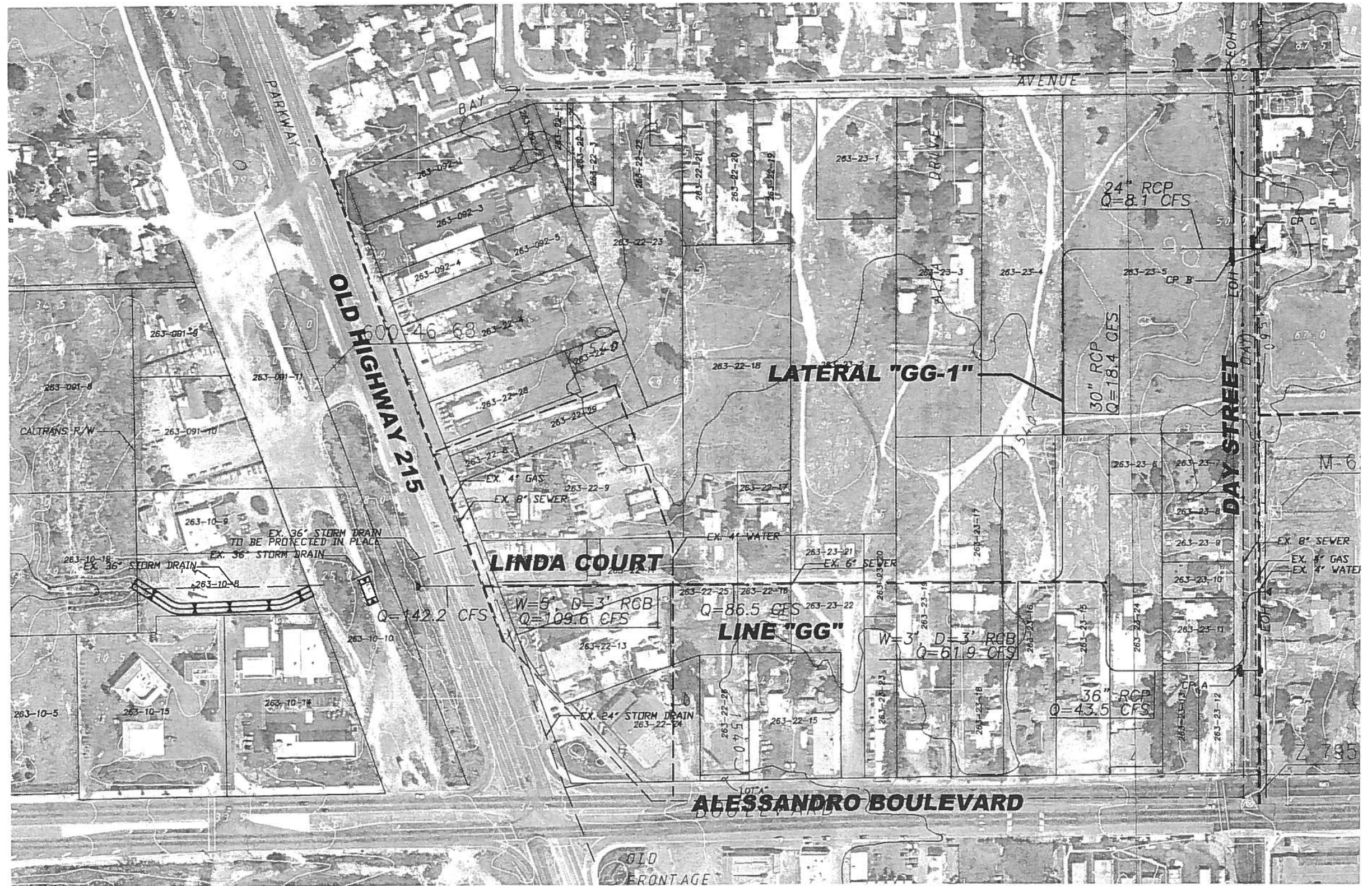
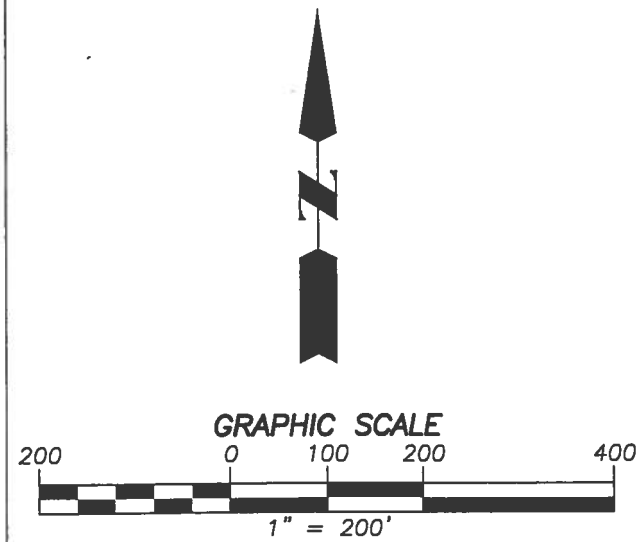
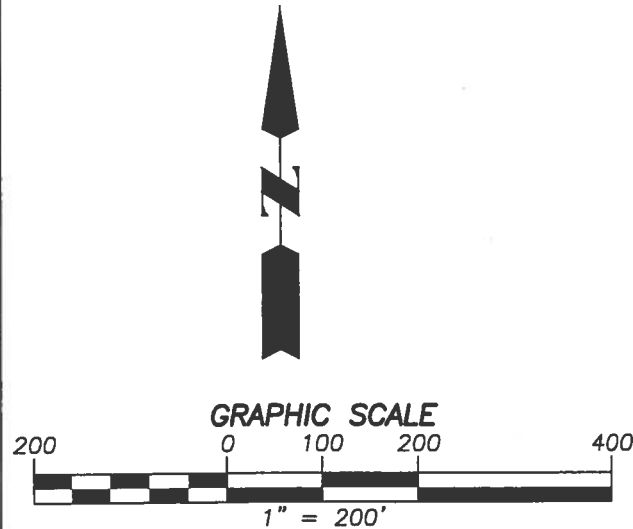
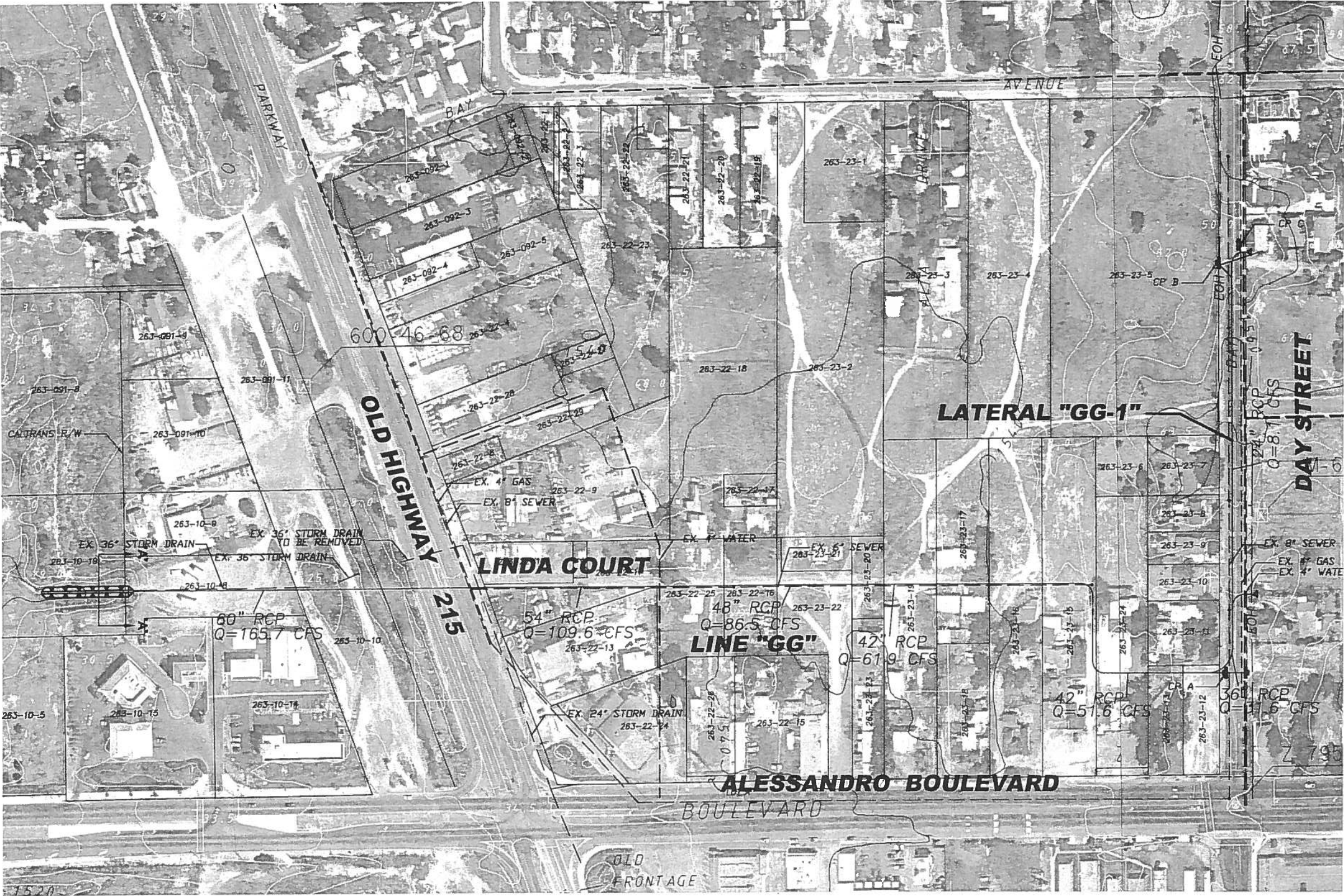


FIGURE 1-2

LINE "GG" STORM DRAIN PLANS ALTERNATIVE 2A



Q:\56111\W\Drainage\ SD-Alt2-A.dwg 08/15/04 08:55

FIGURE 1-3

LINE "GG" STORM DRAIN PLANS ALTERNATIVE 2B

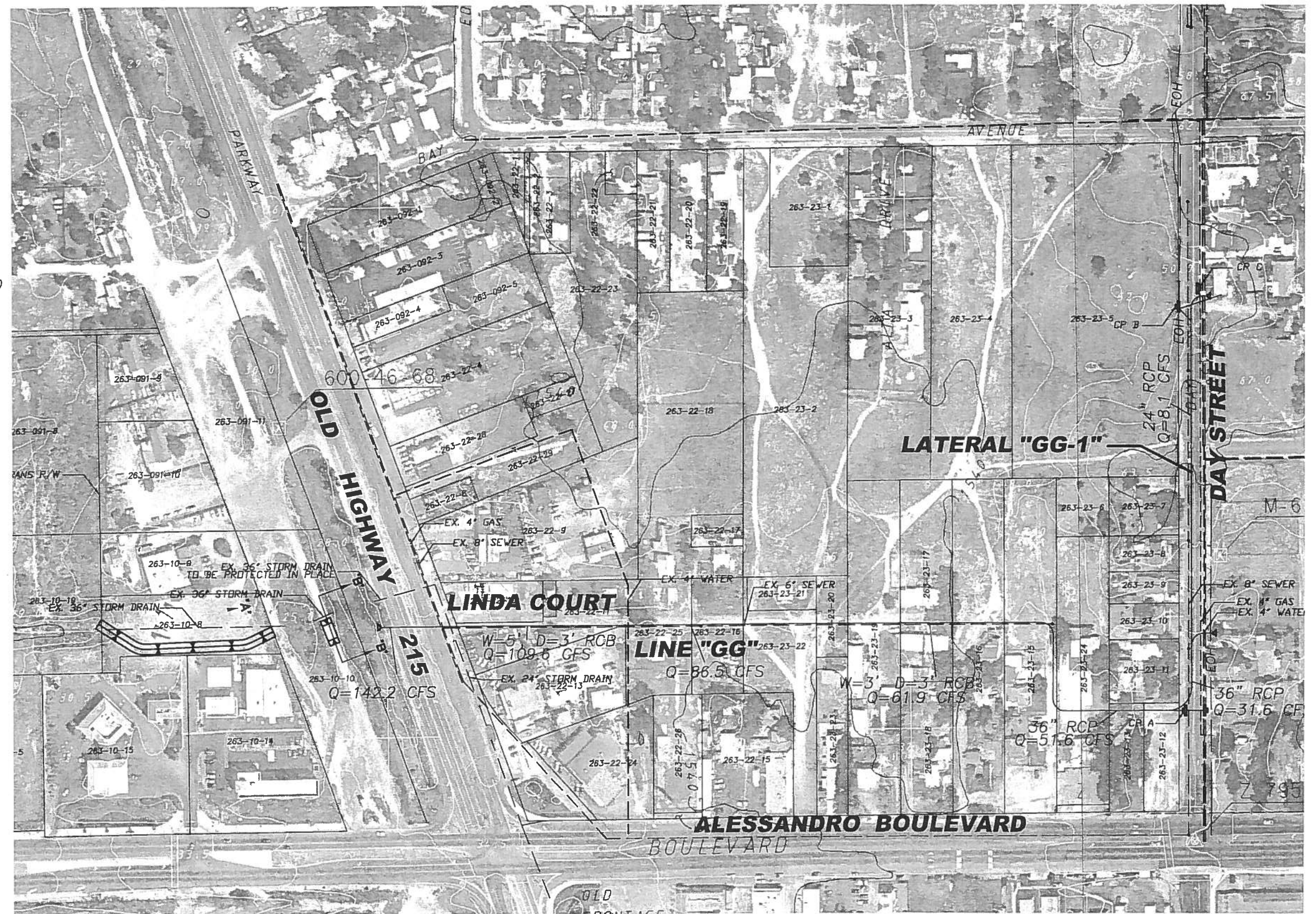
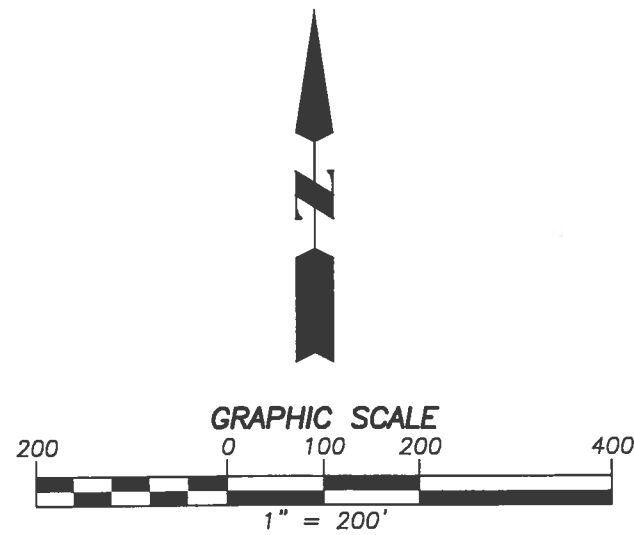


FIGURE 1-4

LINE "GG" STORM DRAIN PLANS INTERIM FOR DAY STREET IMPROVEMENTS

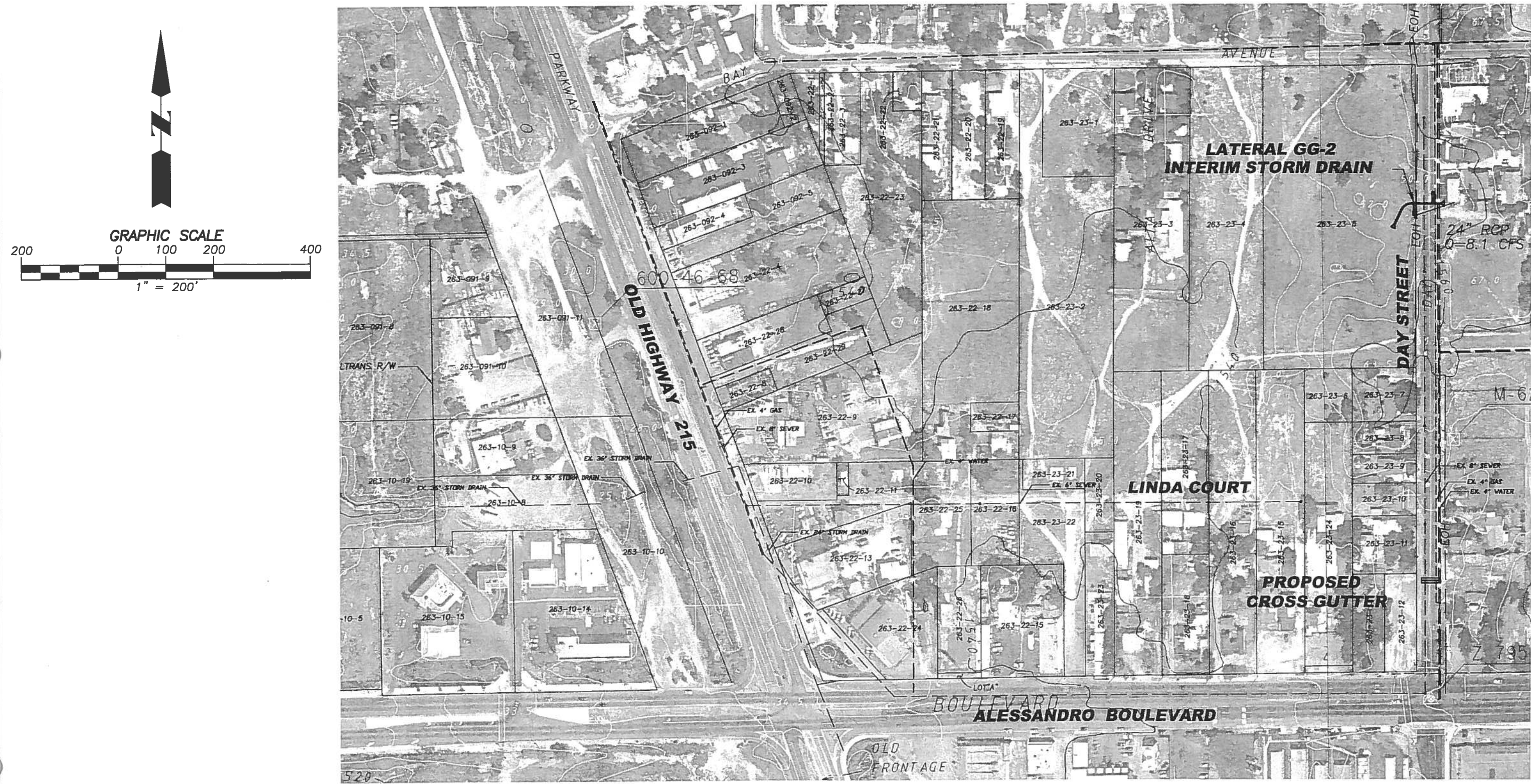
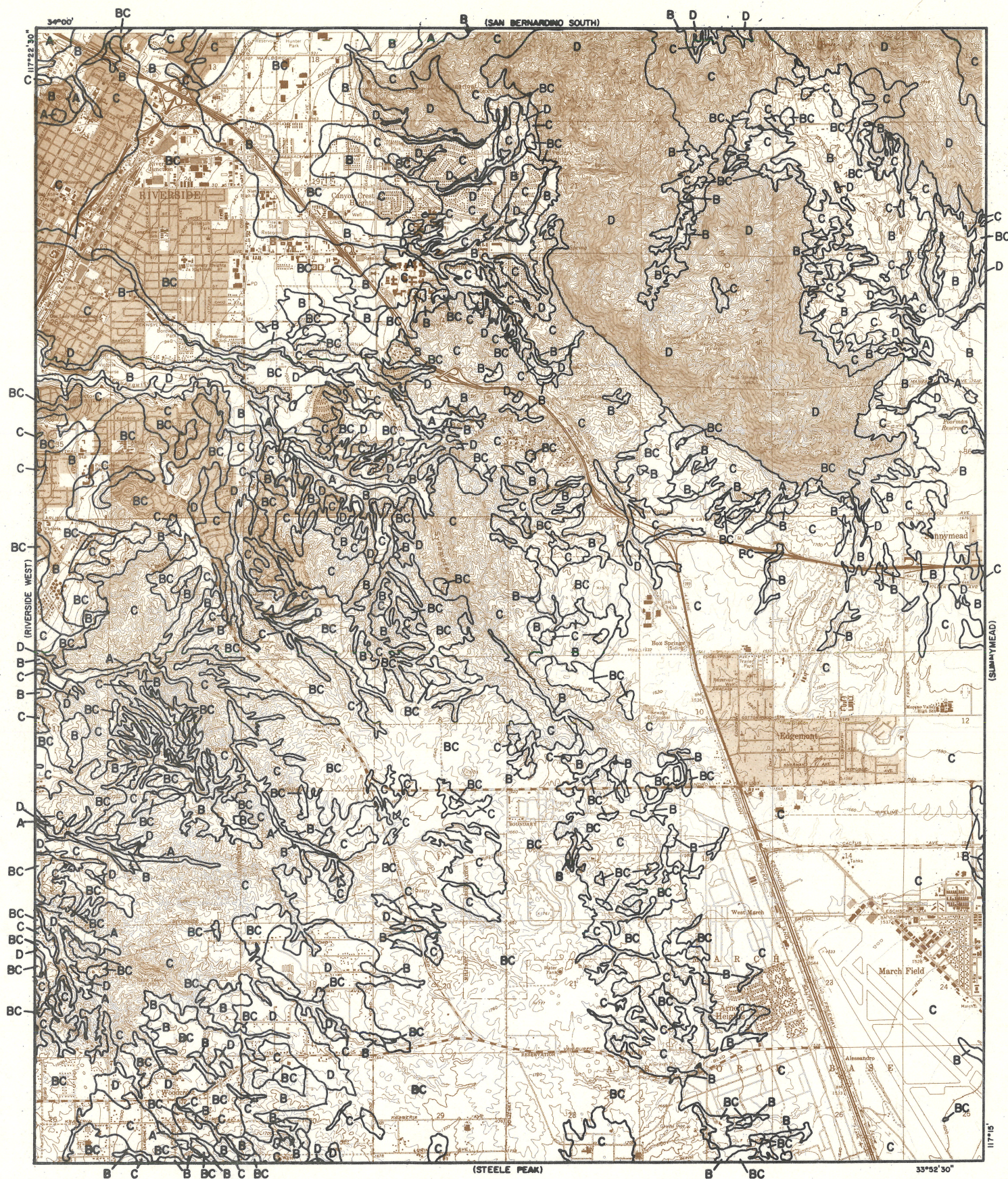


FIGURE 1-5

HYDROLOGIC SOILS GROUP MAP
FROM RCFC&WCD HYDROLOGY MANUAL

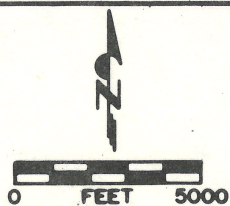


LEGEND

- SOILS GROUP BOUNDARY
- A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL



HYDROLOGIC SOILS GROUP MAP FOR RIVERSIDE-EAST

18

RAINFALL INTENSITY CHART
FROM RCFC&WCD HYDROLOGY MANUAL

RAINFALL INTENSITY—INCHES PER HOUR

SUNNYMEAD - MORENO

DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR
5	2.84	4.16
6	2.59	3.79
7	2.40	3.51
8	2.25	3.29
9	2.12	3.10
10	2.01	2.94
11	1.92	2.80
12	1.83	2.68
13	1.76	2.58
14	1.70	2.48
15	1.64	2.40
16	1.59	2.32
17	1.54	2.25
18	1.50	2.19
19	1.46	2.13
20	1.42	2.08
22	1.35	1.98
24	1.30	1.90
26	1.25	1.82
28	1.20	1.76
30	1.16	1.70
32	1.12	1.64
34	1.09	1.59
36	1.06	1.55
38	1.03	1.51
40	1.00	1.47
45	.95	1.39
50	.90	1.31
55	.86	1.25
60	.82	1.20
65	.79	1.15
70	.76	1.11
75	.73	1.07
80	.71	1.04
85	.69	1.01

SLOPE = .500

WOODCREST

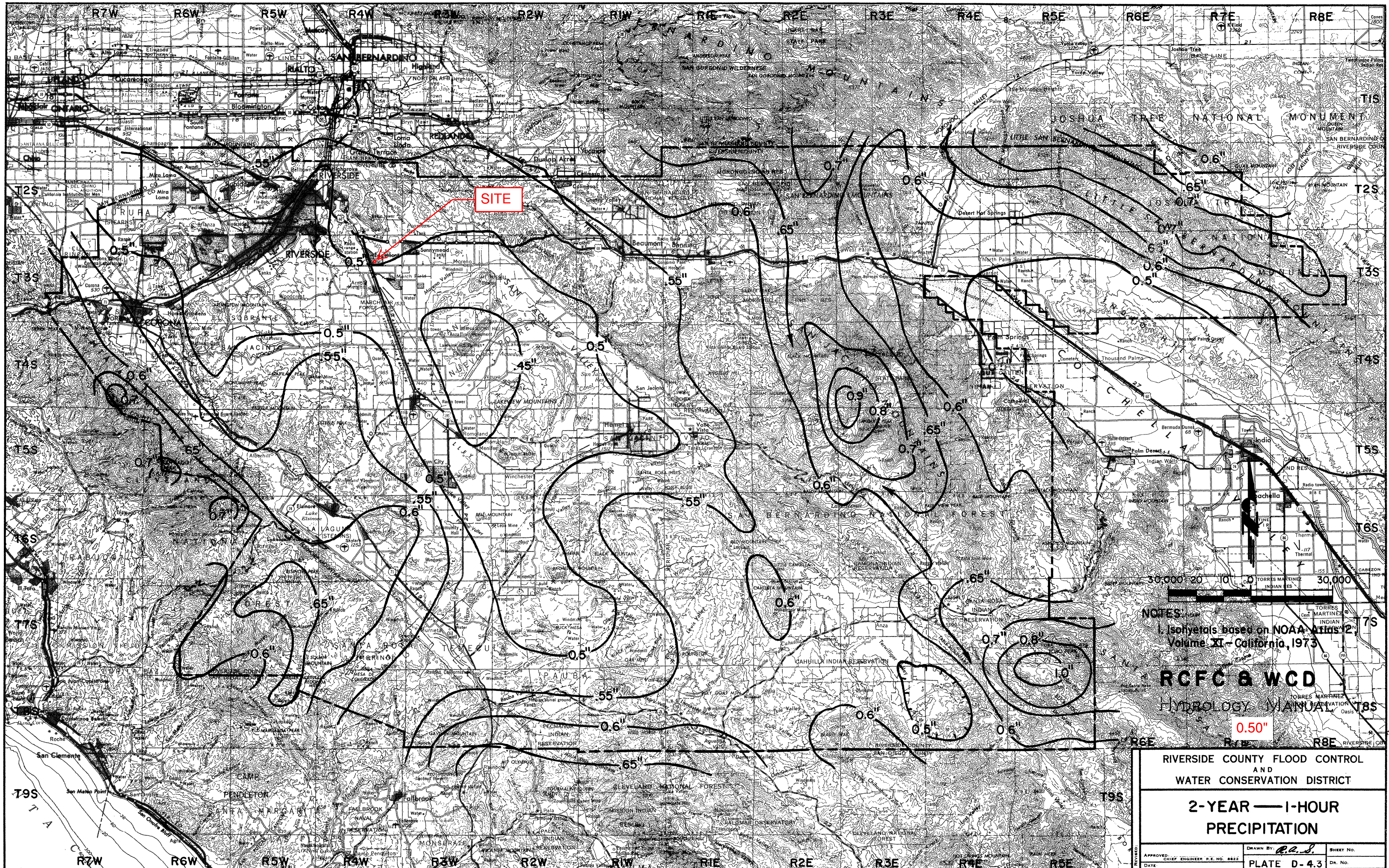
DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR
5	3.37	5.30
6	3.05	4.79
7	2.80	4.40
8	2.60	4.09
9	2.44	3.83
10	2.30	3.62
11	2.19	3.43
12	2.08	3.27
13	1.99	3.13
14	1.91	3.01
15	1.84	2.89
16	1.78	2.79
17	1.72	2.70
18	1.67	2.62
19	1.62	2.54
20	1.57	2.47
22	1.49	2.34
24	1.42	2.23
26	1.36	2.14
28	1.31	2.05
30	1.26	1.98
32	1.22	1.91
34	1.18	1.85
36	1.14	1.79
38	1.11	1.74
40	1.07	1.69
45	1.01	1.58
50	.95	1.49
55	.90	1.42
60	.86	1.35
65	.82	1.29
70	.79	1.24
75	.76	1.19
80	.73	1.15
85	.71	1.11

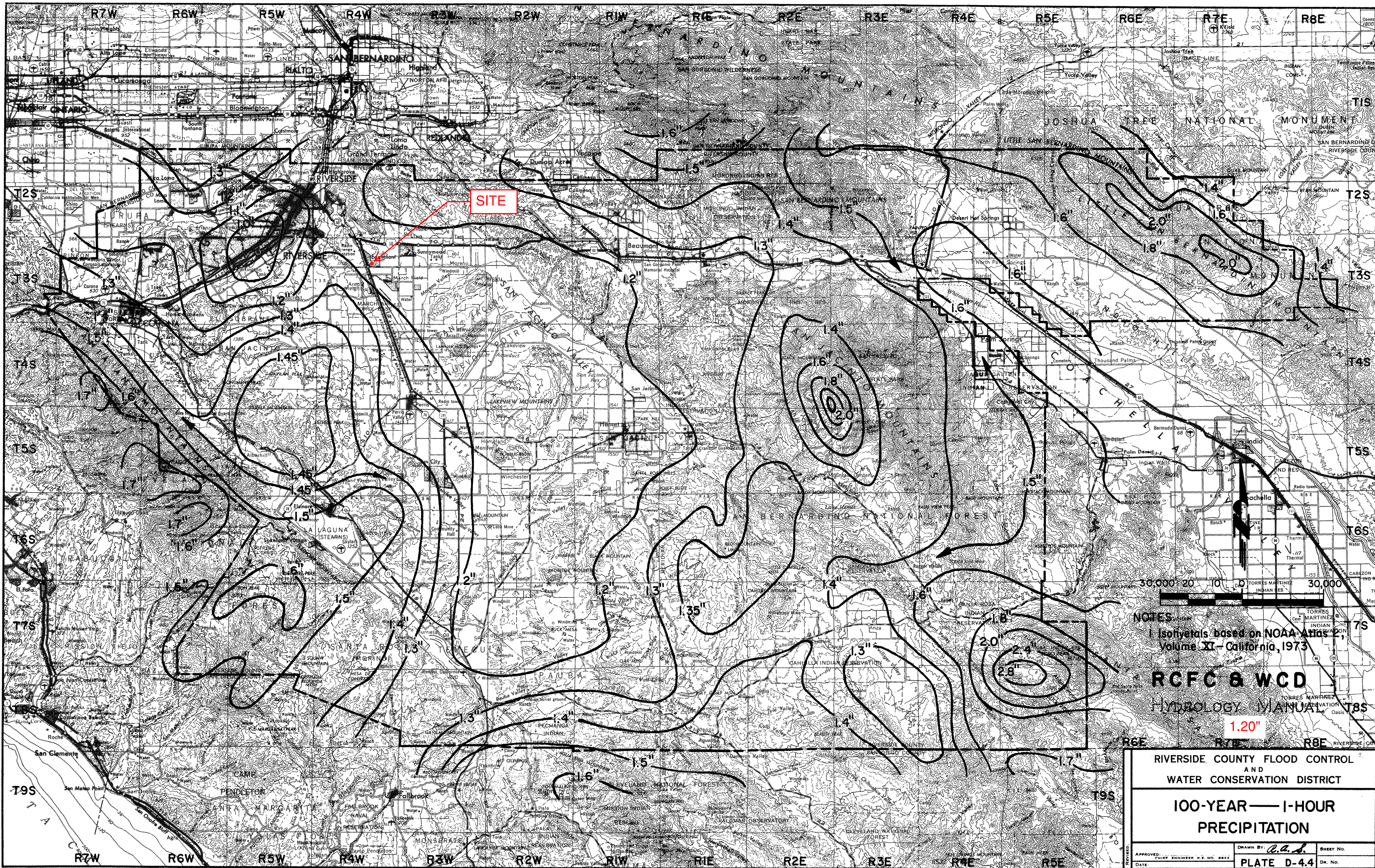
SLOPE = .550

RCFC & WCD
HYDROLOGY MANUAL

STANDARD
INTENSITY - DURATION
CURVES DATA

PRECIPITATION MAPS
FROM RCFC&WCD HYDROLOGY MANUAL



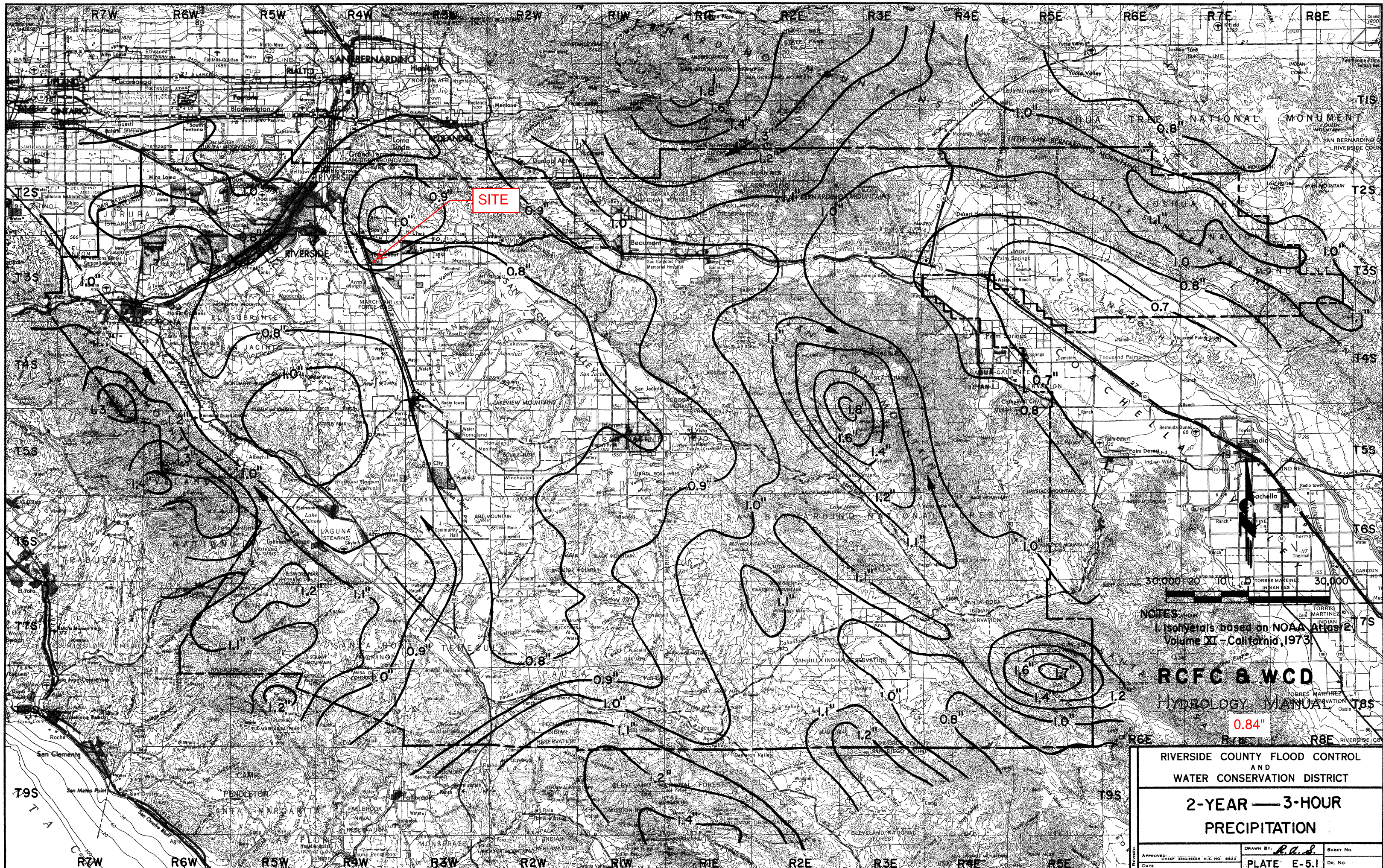


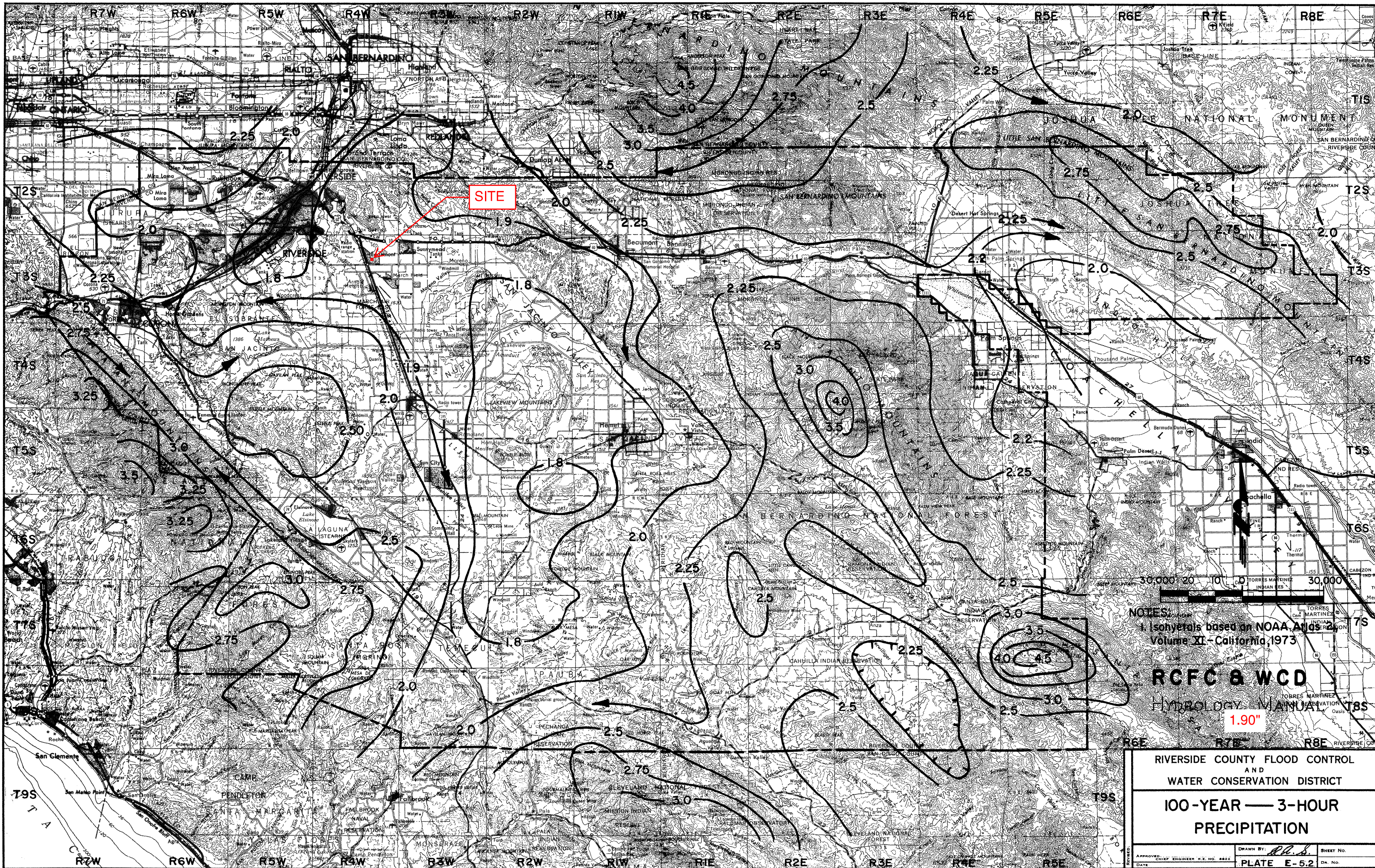
NOTES
1 Isohyets based on NOAA Atlas
Volume XI - California, 1973

RCFC & WCD
HYDROLOGY MANUAL

1.20"

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
100-YEAR — 1-HOUR PRECIPITATION		
APPROVED: DATE	DRAWN BY: C.A.S. DATE	SHEET NO. PLATE D-4.4 Dr. No.

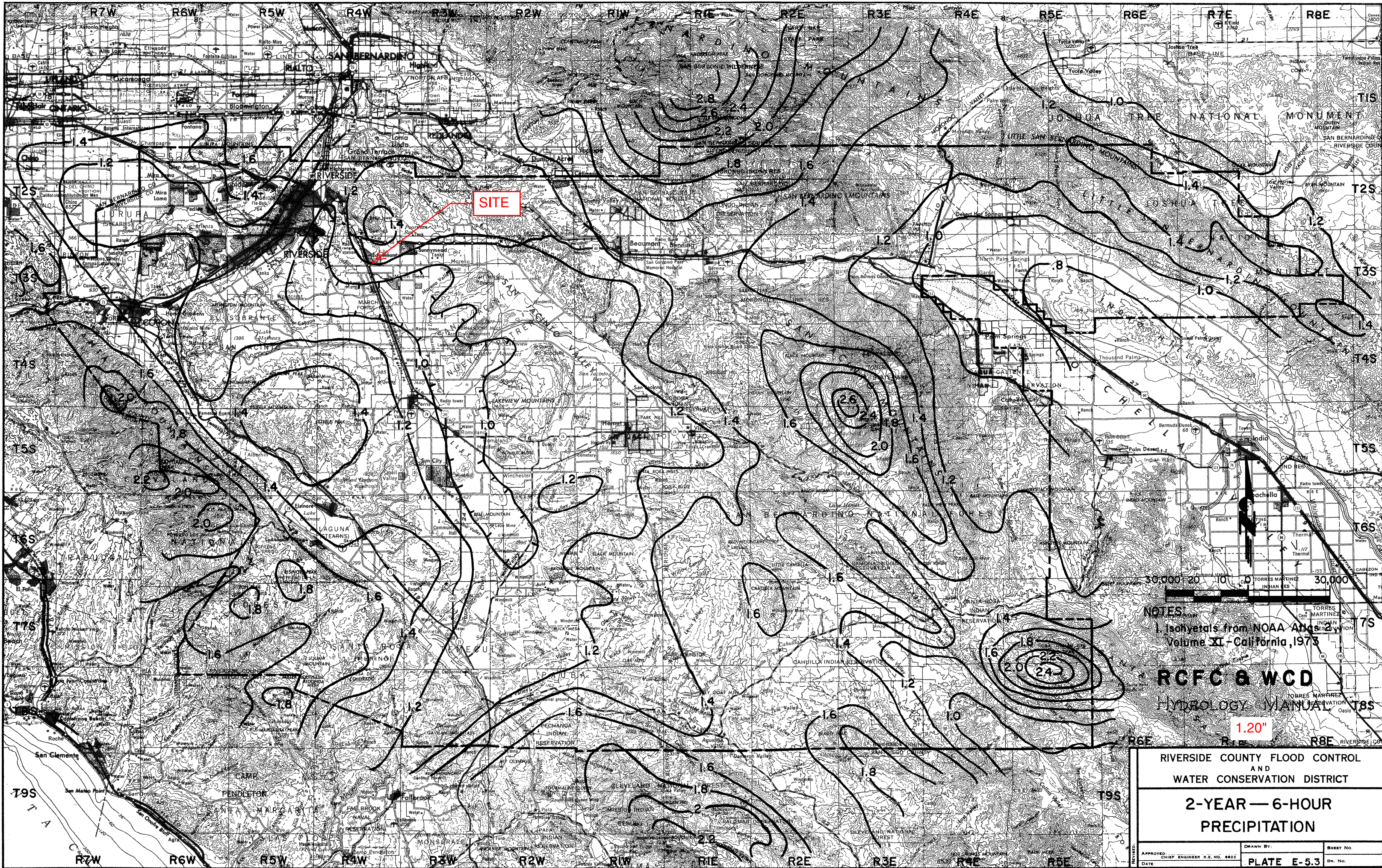


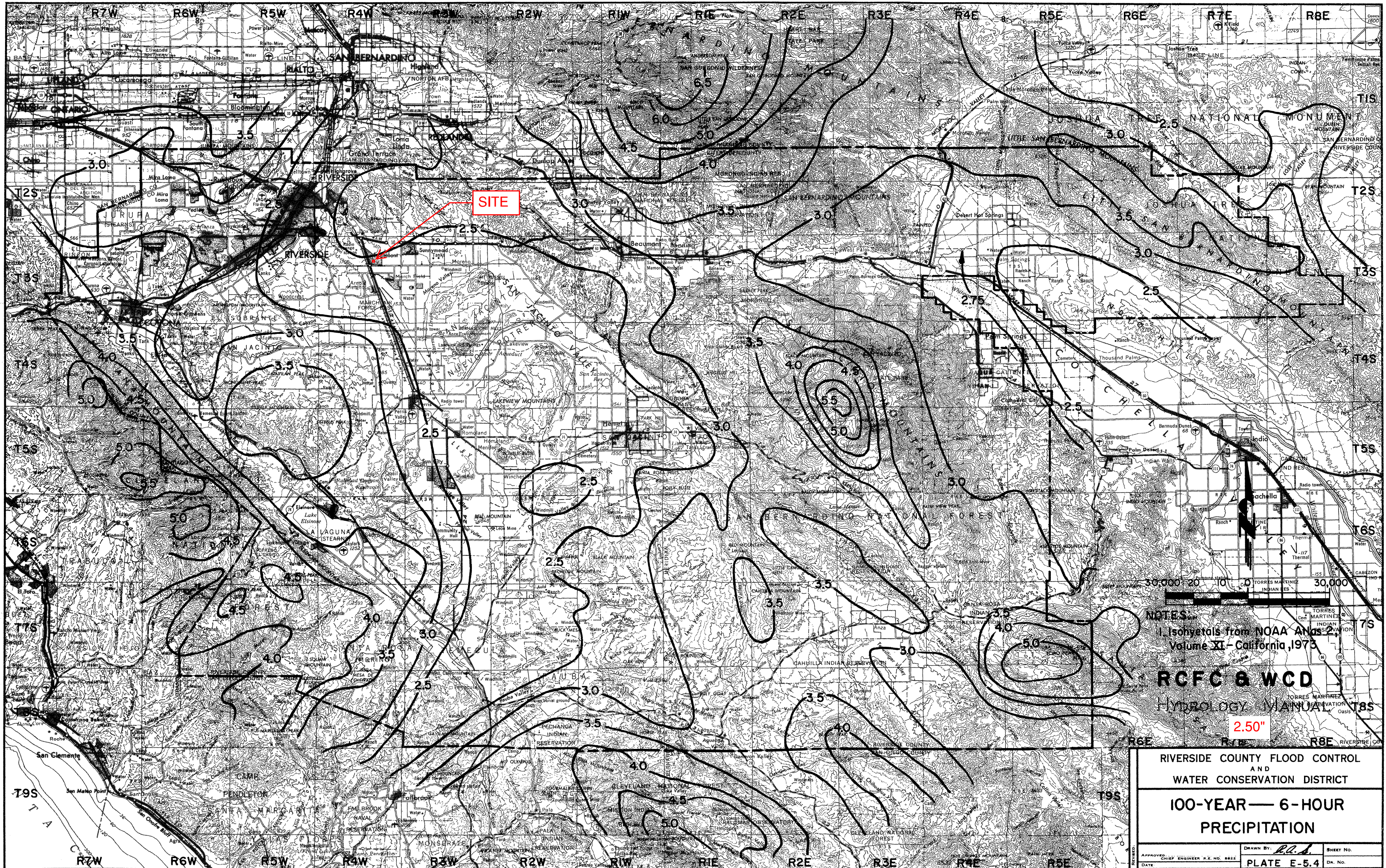


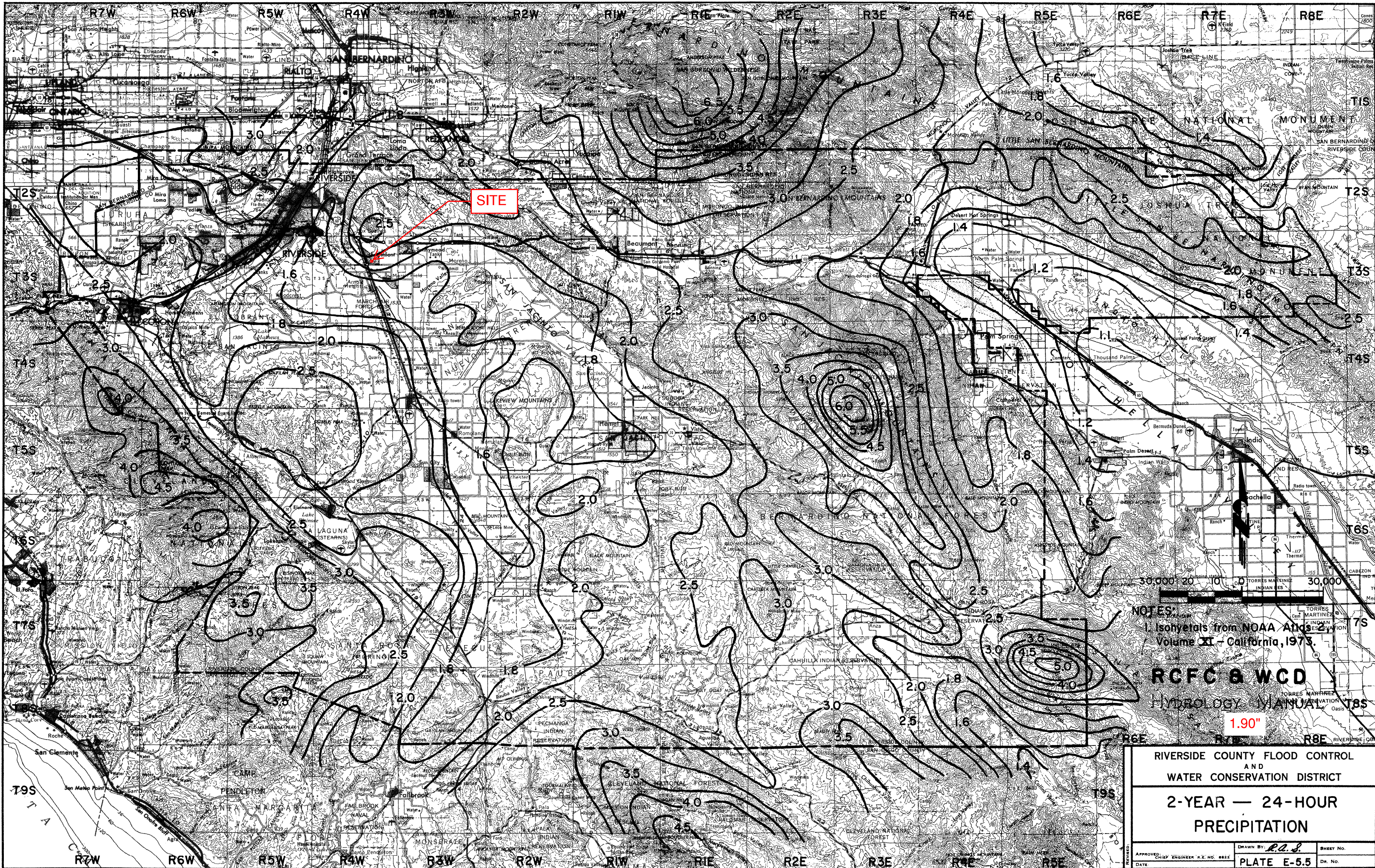
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Volume XI - California, 1973

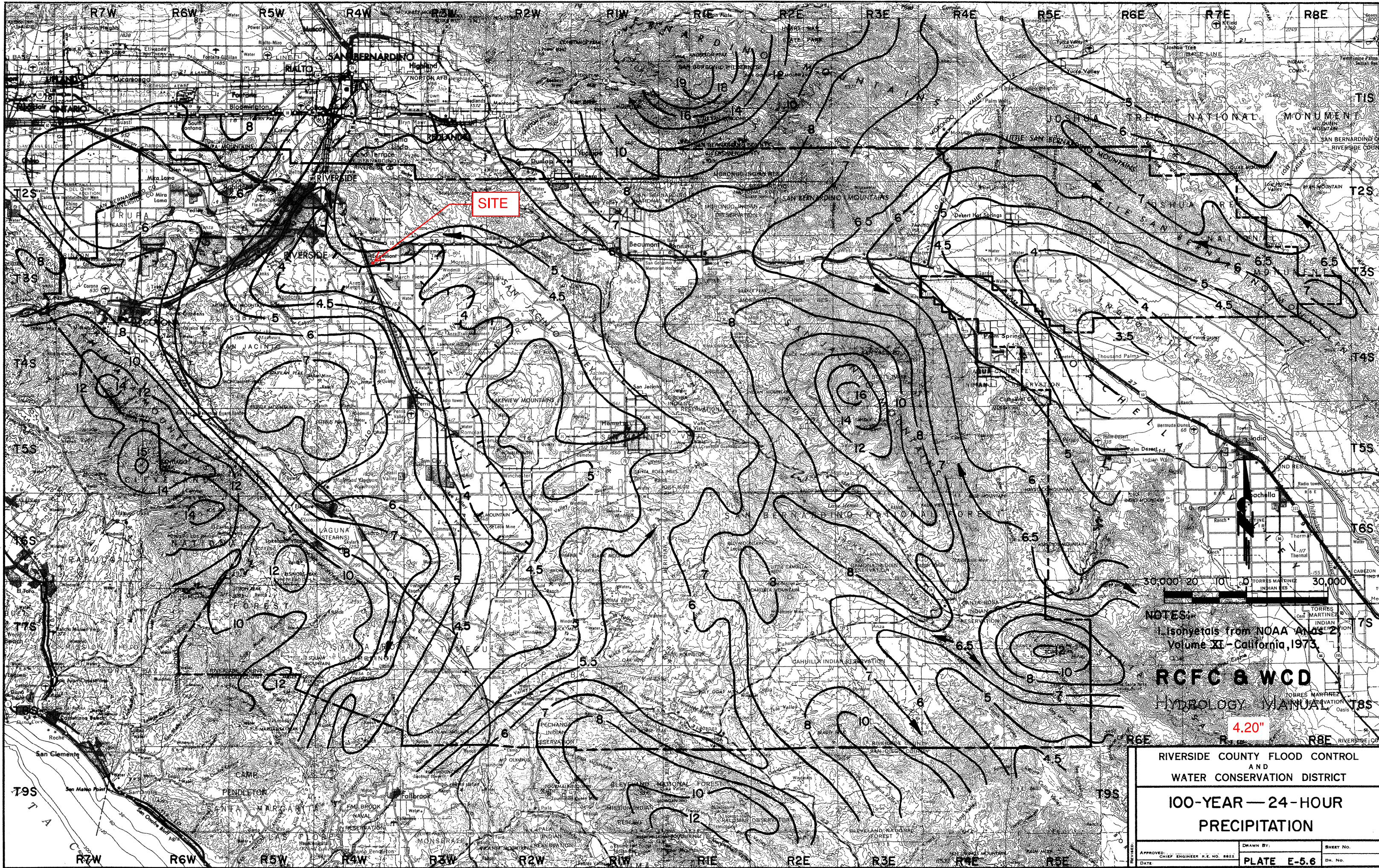
RCFC & WCD
HYDROLOGY MANUAL
1.90"

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100-YEAR — 3-HOUR PRECIPITATION		
APPROVED: <i>[Signature]</i> DATE	DRAWN BY: <i>[Signature]</i> DATE	SHEET NO. DR. NO.
PLATE E-5.2		



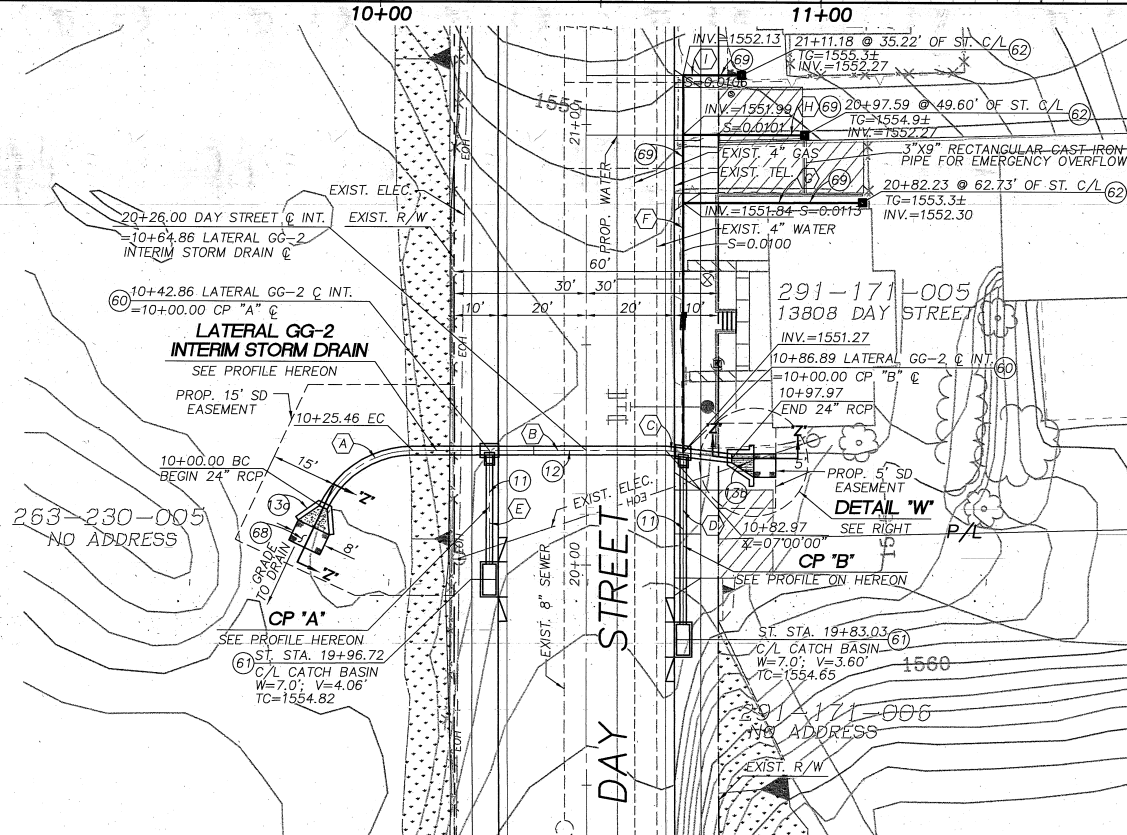
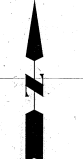
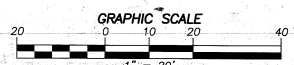






LATERAL GG-2 INTERIM STORM DRAIN
ASBUILT

Drawing Name: G:\56113\25 MPH DESIGN\STREET PLANS\56113_STREET_SH111.dwg
Last Opened: Jan 26, 2009 - 12:27pm by dsmith



INTERIM CULVERT

HYDRAULIC DATA
Q₁₀₀ = 8.1 CFS
V_{MAX} = 5.2 FPS

**LATERAL GG-2
INTERIM STORM DRAIN**

1555
PROP. FINISH SURFACE
@ S.D. C/L
EXISTING GROUND
@ S.D. C/L

CP 'A'

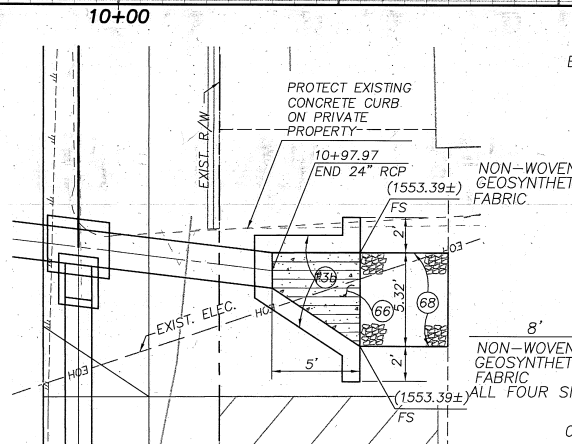
1555
PROP. FINISH SURFACE
@ S.D. C/L
EXISTING GROUND
@ S.D. C/L

CP 'B'

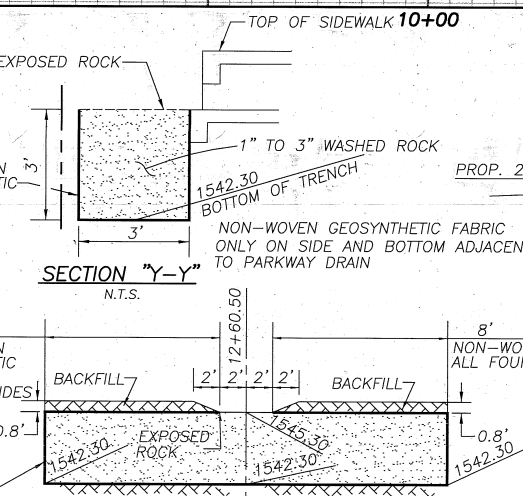


PROFILE SCALES
HORIZ.: 1"=80'
VERT.: 1"=8'

AS-BUILT
For Original Plan
Engineer of Record
Date: 9-30-12

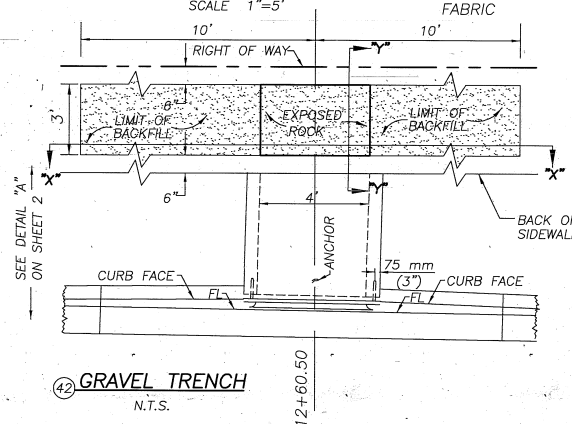


DETAIL 'W'
SCALE 1"=5'



SECTION 'Y-Y'
N.T.S.

SECTION 'Z-Z'
N.T.S.



SECTION 'X-X'
N.T.S.

CURVE/LINE DATA

	DELTA/BEARING	RADIUS	LEN/DIST.	TANGENT
(A)	64°50'31"	22.50'	25.46'	14.29'
(B)	N89°47'10"E	-	57.50'	-
(C)	N83°25'50"W	-	15.00'	-
(D)	N00°12'50"W	-	25.31'	-
(E)	N00°12'50"W	-	25.78'	-
(F)	N00°12'50"W	-	85.70'	-
(G)	N89°47'10"E	-	40.73'	-
(H)	N90°00'00"E	-	27.60'	-
(I)	N90°00'00"W	-	13.22'	-

JUNCTION STRUCTURE DATA							
LATERAL	A	B	C	D ₁	D ₂	L	ELEV. "R" ELEV. "S"
CP "A"	90°00'00"	18"	3.34'	24"	18"	4.25'	1550.65 1550.64
CP "B"	90°00'00"	18"	3.36'	24"	18"	3.53'	1550.87 1550.86

CONSTRUCTION NOTES

- CONSTRUCT 18" RCP (D-LOAD PER PROFILE).
- CONSTRUCT 24" RCP (D-LOAD PER PROFILE).
- CONSTRUCT PIPE WINGWALL PER CALTRANS STD. D86B.
- CONSTRUCT PIPE WINGWALL PER CALTRANS STD. D86B AND DETAIL "W" HERE-ON.
- CONSTRUCT 3' WIDE BY 3' DEEP INFILTRATION TRENCH PER DETAIL HEREON.
- CONSTRUCT JUNCTION STRUCTURE PER APWA STD. NO. 331-2.
- CONSTRUCT CATCH BASIN PER CITY OF MORENO VALLEY STD. NOS. 302A AND 302B W=7'.
- INSTALL 12"x12" TRAFFIC BEARING CATCH BASIN PER BROOKS PRODUCT 1212 CB OR APPROVED EQUIVALENT.
- CONSTRUCT TRASH RACK PER APWA STD. NO. 361-1 AND DETAIL "W" HERE-ON.
- INSTALL GROUTED CLASS "LIGHT" RIPRAP PER CALTRANS STD. SPEC. SECTION 72 (METHOD A PLACEMENT).
- INSTALL 8" PVC SCHED. 40 AREA DRAIN PIPE. CONNECT TO 24" RCP PER APWA STD. NO. 332-1 CASE 1.

CITY OF MORENO VALLEY APPROVALS			
APPROVED BY	DATE	BY	
SUPERVISING ENGINEER			
CITY TRAFFIC ENGINEER	1/21/09	EL	
MAINTENANCE AND OPERATIONS MANAGER	1-27-09	AW	
SENIOR ENGINEER	01/23/09	JZ	

MARK	REVISIONS	APPR	DATE

DESIGNED BY _____ DRAWN BY _____ CHECKED BY _____

AEI CASC CONSULTING
937 SOUTH VIA LATA
SUITE 500
COLTON, CA 92324
PH. (909) 783-0101
FAX (909) 783-0108

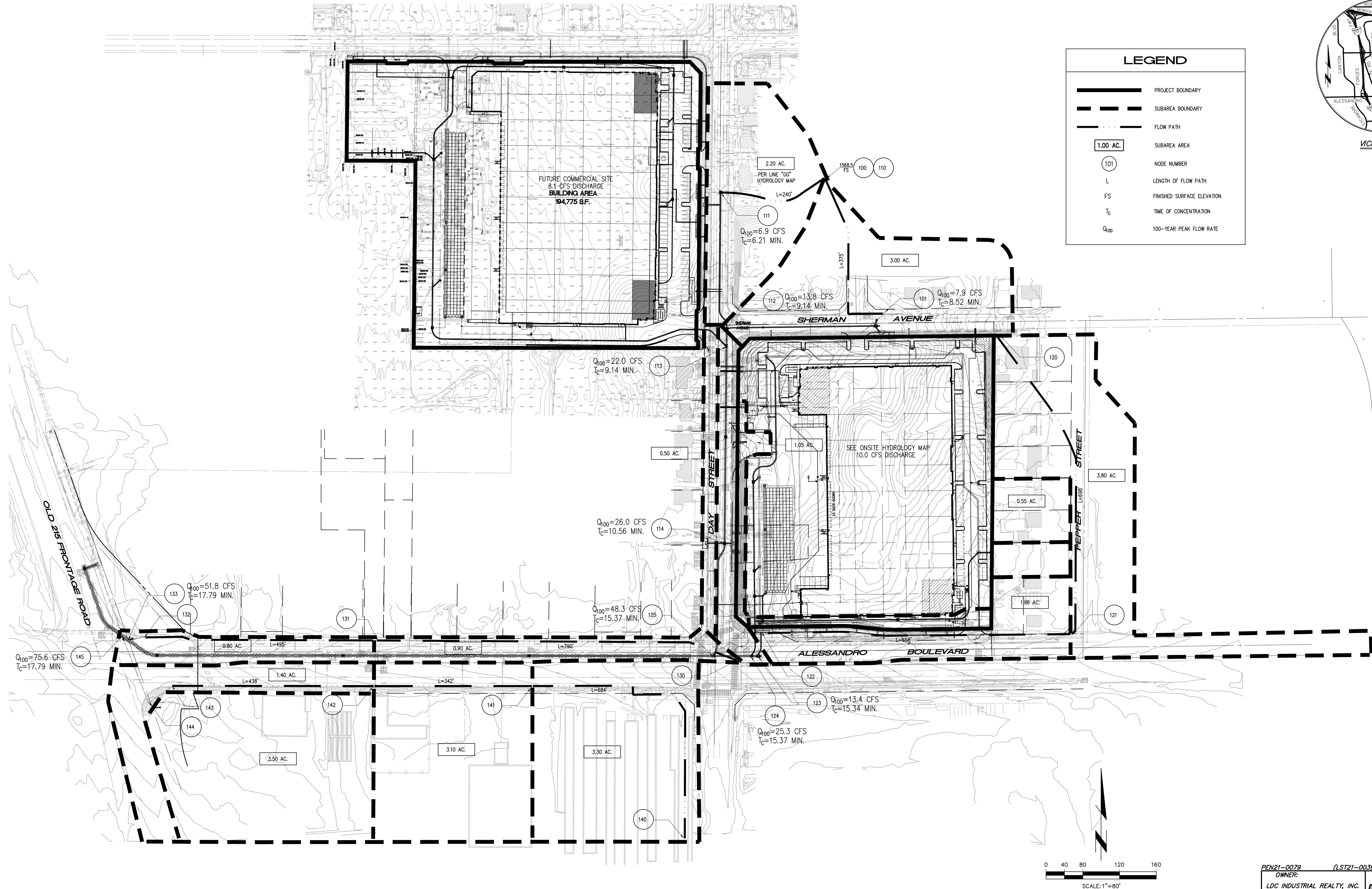
PREPARED UNDER SUPERVISION OF
STEVE J. HOSFORD
RCE 42280 Exp. Date: 03/31/10

ENGINEER OF RECORD'S SEAL
STEVE J. HOSFORD
NO. 42280
EXP. 03/31/10
CIVIL
STATE OF CALIFORNIA

STREET IMPROVEMENT PLANS
DAY STREET
LINE "GG" STORM DRAIN
INTERIM CULVERT

ACC. No. 897.91724
SHEET **11** OF **41**
PROJECT No. 02-8926820

OFFSITE HYDROLOGY MAP AND STORM DRAIN PLAN



LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 1.00 AC.
- 101
- L
- FS
- T_c
- Q₁₀₀

SUBAREA AREA

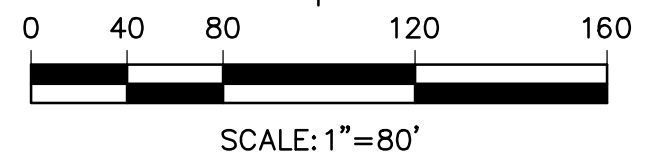
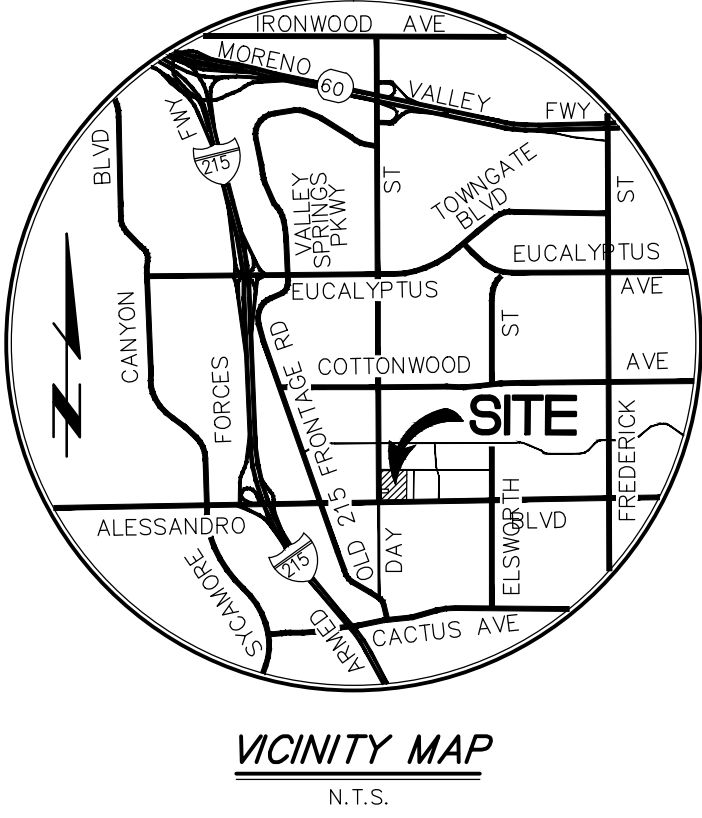
NODE NUMBER

LENGTH OF FLOW PATH

FINISHED SURFACE ELEVATION

TIME OF CONCENTRATION

100-YEAR PEAK FLOW RATE



PEN21-0079 (LST21-0039) Last Update: 5/2/24
Q:\3800-3899\3846\3846HYD-01SITE.dwg

OWNER:
LDC INDUSTRIAL REALTY, INC.
3 MACARTHUR PLACE, SUITE 750
SANTA ANA, CA 92707
LARRY D. COCHRAN
TEL: 949-226-4601
EMAIL: LDCOCHRAN@LDCINDUSTRIAL.COM

ENGINEER:
Thienes Engineering, Inc.
CIVIL ENGINEERING & LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 931-6011 FAX: (714) 931-1123
EMAIL: CESAR@THIENESINC.COM

CITY OF MORENO VALLEY
PUBLIC WORKS DEPARTMENT

OFFSITE HYDROLOGY MAP
PEN20-0162 / LST20-0025
LDC - ALESSANDRO
NORTHEAST CORNER
OF
ALESSANDRO BLVD. AND DAY ST.
MORENO VALLEY, CALIFORNIA

1 of 1 Sheets

JUN 30 2024

APPENDIX B

HYDROLOGY CALCULATIONS

EXISTING CONDITION RATIONAL METHOD CALCULATIONS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL
(c) Copyright 1982-2016 Advanced Engineering Software (aes)
(Rational Tabling Version 23.0)
Release Date: 07/01/2016 License ID 1435

Analysis prepared by:

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

* BAY AND DAY INDUSTRIAL BUILDING *
* EXISTING CONDITION 100-YEAR *
* NODES 100-101 *

FILE NAME: W:\3930\EX100100.DAT
TIME/DATE OF STUDY: 08:40 04/19/2023

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 1.880
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 0.700
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.680
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.000
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = 0.5513834
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = 0.5501947

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.000

SLOPE OF INTENSITY DURATION CURVE = 0.5502

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL

AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

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

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

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

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

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

ASSUMED INITIAL SUBAREA UNIFORM

DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER

TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$

INITIAL SUBAREA FLOW-LENGTH(FEET) = 991.00

UPSTREAM ELEVATION(FEET) = 1556.82

DOWNSTREAM ELEVATION(FEET) = 1537.42

ELEVATION DIFFERENCE(FEET) = 19.40

TC = $0.709 * [(991.00 ** 3) / (19.40)] ** .2 = 24.602$

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.633
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6585
SOIL CLASSIFICATION IS "C"
SUBAREA RUNOFF(CFS) = 9.37
TOTAL AREA(ACRES) = 8.71 TOTAL RUNOFF(CFS) = 9.37

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)	=	8.7	TC(MIN.)	=	24.60
PEAK FLOW RATE(CFS)	=	9.37			

=====

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END OF RATIONAL METHOD ANALYSIS



RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
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(Rational Tabling Version 23.0)
Release Date: 07/01/2016 License ID 1435

Analysis prepared by:

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

* BAY AND DAY INDUSTRIAL BUILDING *
* EXISTING CONDITION 100-YEAR *
* NODES 110-111 *

FILE NAME: W:\3930\EX110100.DAT
TIME/DATE OF STUDY: 08:42 04/19/2023

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 1.880
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 0.700
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.680
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.000
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = 0.5513834
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = 0.5501947

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.000

SLOPE OF INTENSITY DURATION CURVE = 0.5502

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL

AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

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

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

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

FLOW PROCESS FROM NODE 110.00 TO NODE 111.00 IS CODE = 21

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

ASSUMED INITIAL SUBAREA UNIFORM

DEVELOPMENT IS: UNDEVELOPED WITH FAIR COVER

TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.00

UPSTREAM ELEVATION(FEET) = 1546.95

DOWNSTREAM ELEVATION(FEET) = 1541.30

ELEVATION DIFFERENCE(FEET) = 5.65

TC = $0.709 * [(295.00 ** 3) / (5.65)] ** .2 = 15.219$

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.127
UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7022
SOIL CLASSIFICATION IS "C"
SUBAREA RUNOFF(CFS) = 1.27
TOTAL AREA(ACRES) = 0.85 TOTAL RUNOFF(CFS) = 1.27

=====

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 0.9 TC(MIN.) = 15.22
PEAK FLOW RATE(CFS) = 1.27

=====

=====

END OF RATIONAL METHOD ANALYSIS



PROPOSED CONDITION RATIONAL METHOD CALCULATIONS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL
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(Rational Tabling Version 23.0)
Release Date: 07/01/2016 License ID 1435

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* BAY AND DAY INDUSTRIAL BUILDING *
* PROPOSED CONDITION 100-YEAR *
* NODES 100-124 *

FILE NAME: W:\3930\PR100100.DAT
TIME/DATE OF STUDY: 16:38 02/23/2024

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 1.880
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 0.700
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.680
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.000
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = 0.5513834
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = 0.5501947
COMPUTED RAINFALL INTENSITY DATA:
STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.000
SLOPE OF INTENSITY DURATION CURVE = 0.5502
RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
FOR ALL DOWNSTREAM ANALYSES

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.67 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
- *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

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

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL
 $TC = K * [(LENGTH^{**3}) / (ELEVATION\ CHANGE)]^{**2}$
INITIAL SUBAREA FLOW-LENGTH(FEET) = 254.00
UPSTREAM ELEVATION(FEET) = 1558.50
DOWNSTREAM ELEVATION(FEET) = 1550.05
ELEVATION DIFFERENCE(FEET) = 8.45
 $TC = 0.303 * [(254.00^{**3}) / (8.45)]^{**2} = 5.484$
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.730
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8875
SOIL CLASSIFICATION IS "C"
SUBAREA RUNOFF(CFS) = 4.67
TOTAL AREA(ACRES) = 1.41 TOTAL RUNOFF(CFS) = 4.67

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 31

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


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>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1546.05 DOWNSTREAM(FEET) = 1544.34
FLOW LENGTH(FEET) = 38.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.56
ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.67
PIPE TRAVEL TIME(MIN.) = 0.06 Tc(MIN.) = 5.54
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 292.00 FEET.

*****
FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.707
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8875
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.12 SUBAREA RUNOFF(CFS) = 0.39
TOTAL AREA(ACRES) = 1.5 TOTAL RUNOFF(CFS) = 5.06
TC(MIN.) = 5.54

*****
FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1544.34 DOWNSTREAM(FEET) = 1543.63
FLOW LENGTH(FEET) = 142.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.72
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.06
PIPE TRAVEL TIME(MIN.) = 0.50 Tc(MIN.) = 6.05
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 434.00 FEET.

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.535
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8870
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.08 SUBAREA RUNOFF(CFS) = 0.25
TOTAL AREA(ACRES) = 1.6 TOTAL RUNOFF(CFS) = 5.31
TC(MIN.) = 6.05

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 104.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1543.63 DOWNSTREAM(FEET) = 1543.56
FLOW LENGTH(FEET) = 13.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.90
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.31
PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 6.09
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 104.00 = 447.00 FEET.

*****
FLOW PROCESS FROM NODE 104.00 TO NODE 104.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.521
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8869
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.26 SUBAREA RUNOFF(CFS) = 0.81
TOTAL AREA(ACRES) = 1.9 TOTAL RUNOFF(CFS) = 6.13
TC(MIN.) = 6.09

*****
FLOW PROCESS FROM NODE 104.00 TO NODE 105.00 IS CODE = 31

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-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1543.56 DOWNSTREAM(FEET) = 1542.95
FLOW LENGTH(FEET) = 123.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.89
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.13
PIPE TRAVEL TIME(MIN.) = 0.42 Tc(MIN.) = 6.51
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 105.00 = 570.00 FEET.

*****
FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.394
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8865
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.44 SUBAREA RUNOFF(CFS) = 1.32
TOTAL AREA(ACRES) = 2.3 TOTAL RUNOFF(CFS) = 7.45
TC(MIN.) = 6.51

*****
FLOW PROCESS FROM NODE 105.00 TO NODE 106.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1542.95 DOWNSTREAM(FEET) = 1542.27
FLOW LENGTH(FEET) = 136.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.05
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.45
PIPE TRAVEL TIME(MIN.) = 0.45 Tc(MIN.) = 6.96
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 106.00 = 706.00 FEET.

*****
FLOW PROCESS FROM NODE 106.00 TO NODE 106.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.272
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8861
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.14
TOTAL AREA(ACRES) = 2.4 TOTAL RUNOFF(CFS) = 7.59
TC(MIN.) = 6.96

*****
FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1542.27 DOWNSTREAM(FEET) = 1540.37
FLOW LENGTH(FEET) = 239.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.17
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.59
PIPE TRAVEL TIME(MIN.) = 0.65 Tc(MIN.) = 7.60
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 107.00 = 945.00 FEET.

*****
FLOW PROCESS FROM NODE 107.00 TO NODE 107.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.116
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8855
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.12 SUBAREA RUNOFF(CFS) = 0.33
TOTAL AREA(ACRES) = 2.5 TOTAL RUNOFF(CFS) = 7.93
TC(MIN.) = 7.60

```



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*****
FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1540.37 DOWNSTREAM(FEET) = 1539.35
FLOW LENGTH(FEET) = 106.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.72
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.93
PIPE TRAVEL TIME(MIN.) = 0.26 Tc(MIN.) = 7.87
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 = 1051.00 FEET.

*****
FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.058
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8853
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.07 SUBAREA RUNOFF(CFS) = 0.19
TOTAL AREA(ACRES) = 2.5 TOTAL RUNOFF(CFS) = 8.11
TC(MIN.) = 7.87

*****
FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.058
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8853
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.27
TOTAL AREA(ACRES) = 2.6 TOTAL RUNOFF(CFS) = 8.39
TC(MIN.) = 7.87

*****
FLOW PROCESS FROM NODE    108.00 TO NODE    112.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1539.35 DOWNSTREAM(FEET) = 1538.96
FLOW LENGTH(FEET) = 194.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.77
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.39
PIPE TRAVEL TIME(MIN.) = 0.86 Tc(MIN.) = 8.72
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    112.00 = 1245.00 FEET.

*****
FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.72
RAINFALL INTENSITY(INCH/HR) = 2.89
TOTAL STREAM AREA(ACRES) = 2.65
PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.39

*****
FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) = 246.00
UPSTREAM ELEVATION(FEET) = 1548.80
DOWNSTREAM ELEVATION(FEET) = 1546.47
ELEVATION DIFFERENCE(FEET) = 2.33
TC = 0.303*[( 246.00**3)/( 2.33)]**.2 = 6.961

```


100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.271
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8861
SOIL CLASSIFICATION IS "C"
SUBAREA RUNOFF(CFS) = 8.87
TOTAL AREA(ACRES) = 3.06 TOTAL RUNOFF(CFS) = 8.87

FLOW PROCESS FROM NODE 111.00 TO NODE 112.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1542.47 DOWNSTREAM(FEET) = 1538.96
FLOW LENGTH(FEET) = 22.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 19.92
ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.87
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.98
LONGEST FLOWPATH FROM NODE 110.00 TO NODE 112.00 = 268.00 FEET.

FLOW PROCESS FROM NODE 112.00 TO NODE 112.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 6.98
RAINFALL INTENSITY(INCH/HR) = 3.27
TOTAL STREAM AREA(ACRES) = 3.06
PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.87

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	8.39	8.72	2.889	2.65
2	8.87	6.98	3.266	3.06

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	15.58	6.98	3.266
2	16.23	8.72	2.889

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 16.23 Tc(MIN.) = 8.72
TOTAL AREA(ACRES) = 5.7
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 112.00 = 1245.00 FEET.

FLOW PROCESS FROM NODE 112.00 TO NODE 112.00 IS CODE = 81

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.889
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8845
SOIL CLASSIFICATION IS "C"
SUBAREA AREA(ACRES) = 0.67 SUBAREA RUNOFF(CFS) = 1.71
TOTAL AREA(ACRES) = 6.4 TOTAL RUNOFF(CFS) = 17.94
TC(MIN.) = 8.72

FLOW PROCESS FROM NODE 112.00 TO NODE 122.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1538.96 DOWNSTREAM(FEET) = 1538.41
FLOW LENGTH(FEET) = 276.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 30.0 INCH PIPE IS 22.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.47
ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 17.94
PIPE TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 9.75


```

LONGEST FLOWPATH FROM NODE    100.00 TO NODE    122.00 =    1521.00 FEET.

*****
FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =    1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS =    2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM    1 ARE:
TIME OF CONCENTRATION(MIN.) =    9.75
RAINFALL INTENSITY(INCH/HR) =    2.72
TOTAL STREAM AREA(ACRES) =    6.38
PEAK FLOW RATE(CFS) AT CONFLUENCE =    17.94

*****
FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =    21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
      ASSUMED INITIAL SUBAREA UNIFORM
      DEVELOPMENT IS COMMERCIAL
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =    718.00
UPSTREAM ELEVATION(FEET) =    1560.21
DOWNSTREAM ELEVATION(FEET) =    1546.47
ELEVATION DIFFERENCE(FEET) =    13.74
TC = 0.303*[( 718.00**3)/( 13.74)]**.2 =    9.282
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =    2.792
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8841
SOIL CLASSIFICATION IS "C"
SUBAREA RUNOFF(CFS) =    7.65
TOTAL AREA(ACRES) =    3.10  TOTAL RUNOFF(CFS) =    7.65

*****
FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =    31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    1542.47  DOWNSTREAM(FEET) =    1538.41
FLOW LENGTH(FEET) =    22.00  MANNING'S N =    0.012
DEPTH OF FLOW IN 12.0 INCH PIPE IS    5.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    20.29
ESTIMATED PIPE DIAMETER(INCH) =    12.00  NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =    7.65
PIPE TRAVEL TIME(MIN.) =    0.02  Tc(MIN.) =    9.30
LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =    740.00 FEET.

*****
FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =    1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS =    2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM    2 ARE:
TIME OF CONCENTRATION(MIN.) =    9.30
RAINFALL INTENSITY(INCH/HR) =    2.79
TOTAL STREAM AREA(ACRES) =    3.10
PEAK FLOW RATE(CFS) AT CONFLUENCE =    7.65

** CONFLUENCE DATA **
STREAM    RUNOFF    Tc    INTENSITY    AREA
NUMBER    (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
  1      17.52      8.01      3.028      6.38
  1      17.94      9.75      2.717      6.38
  2       7.65      9.30      2.789      3.10

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

** PEAK FLOW RATE TABLE **
STREAM    RUNOFF    Tc    INTENSITY
NUMBER    (CFS)    (MIN.)    (INCH/HOUR)
  1      24.11      8.01      3.028
  2      24.76      9.30      2.789
  3      25.40      9.75      2.717

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```


PEAK FLOW RATE(CFS) = 25.40 Tc(MIN.) = 9.75
TOTAL AREA(ACRES) = 9.5
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 122.00 = 1521.00 FEET.

FLOW PROCESS FROM NODE 122.00 TO NODE 123.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) =	1538.41	DOWNSTREAM(FEET) =	1538.24
FLOW LENGTH(FEET) =	86.00	MANNING'S N =	0.012
DEPTH OF FLOW IN	36.0 INCH PIPE IS	24.6 INCHES	
PIPE-FLOW VELOCITY(FEET/SEC.) =	4.93		
ESTIMATED PIPE DIAMETER(INCH) =	36.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	25.40		
PIPE TRAVEL TIME(MIN.) =	0.29	Tc(MIN.) =	10.04
LONGEST FLOWPATH FROM NODE	100.00 TO NODE	123.00 =	1607.00 FEET.

FLOW PROCESS FROM NODE 123.00 TO NODE 124.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) =	1540.23	DOWNSTREAM(FEET) =	1538.91
FLOW LENGTH(FEET) =	662.00	MANNING'S N =	0.012
DEPTH OF FLOW IN	36.0 INCH PIPE IS	24.5 INCHES	
PIPE-FLOW VELOCITY(FEET/SEC.) =	4.95		
ESTIMATED PIPE DIAMETER(INCH) =	36.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	25.40		
PIPE TRAVEL TIME(MIN.) =	2.23	Tc(MIN.) =	12.27
LONGEST FLOWPATH FROM NODE	100.00 TO NODE	124.00 =	2269.00 FEET.

=====

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 9.5 TC(MIN.) = 12.27
PEAK FLOW RATE(CFS) = 25.40

*** PEAK FLOW RATE TABLE ***

	Q(CFS)	Tc(MIN.)
1	24.11	10.62
2	24.76	11.91
3	25.40	12.27

=====

END OF RATIONAL METHOD ANALYSIS

▲

APPENDIX C

DETENTION CALCULATIONS

PROPOSED CONDITION HYDROGRAPHS
(10-YEAR 1HR, 3HR, 6HR & 24HR EVENTS)

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930PR10110.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
PROPOSED CONDITION
10-YEAR 1 HR
DETENTION CALCULATIONS

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.033 Hr.
Lag time = 1.98 Min.
25% of lag time = 0.50 Min.
40% of lag time = 0.79 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	0.50	4.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	1.20	11.48

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.788(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 0.788(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
-----------	--------	-------	--------	---	-----	------	------	------

0+ 5	0.0122	1.77	V	Q				
0+10	0.0341	3.18		V	Q			
0+15	0.0599	3.75			V	Q		
0+20	0.0878	4.05				V	Q	
0+25	0.1183	4.43					Q	
0+30	0.1528	5.00					QV	
0+35	0.1917	5.65					Q	V
0+40	0.2368	6.56						Q
0+45	0.2973	8.78						V
0+50	0.4217	18.06						Q
0+55	0.5185	14.06					V	
1+ 0	0.5621	6.33					Q	
1+ 5	0.5796	2.53			Q			
1+10	0.5823	0.39	Q					
1+15	0.5828	0.08	Q					

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930PR10310.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
PROPOSED CONDITION
10-YEAR 3 HR
DETENTION CALCULATIONS

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.033 Hr.
Lag time = 1.98 Min.
25% of lag time = 0.50 Min.
40% of lag time = 0.79 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	0.84	8.04

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	1.90	18.18

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.840(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.276(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.276(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

9.570 69.00 0.900
Total Area Entered = 9.57(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.900	0.071	1.000	0.071
						Sum (F) = 0.071

Area averaged mean soil loss (F) (In/Hr) = 0.071
Minimum soil loss rate ((In/Hr)) = 0.035
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Unit Hydrograph VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	252.222	51.184	4.937
2 0.167	504.443	39.917	3.850
3 0.250	756.665	6.948	0.670
4 0.333	1008.887	1.951	0.188
Sum = 100.000		Sum=	9.645

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)		Effective (In/Hr)	
			Max	Low		
1	0.08	1.30	0.199	(0.071)	0.020	0.179
2	0.17	1.30	0.199	(0.071)	0.020	0.179
3	0.25	1.10	0.168	(0.071)	0.017	0.152
4	0.33	1.50	0.230	(0.071)	0.023	0.207
5	0.42	1.50	0.230	(0.071)	0.023	0.207
6	0.50	1.80	0.276	(0.071)	0.028	0.248
7	0.58	1.50	0.230	(0.071)	0.023	0.207
8	0.67	1.80	0.276	(0.071)	0.028	0.248
9	0.75	1.80	0.276	(0.071)	0.028	0.248
10	0.83	1.50	0.230	(0.071)	0.023	0.207
11	0.92	1.60	0.245	(0.071)	0.024	0.220
12	1.00	1.80	0.276	(0.071)	0.028	0.248
13	1.08	2.20	0.337	(0.071)	0.034	0.303
14	1.17	2.20	0.337	(0.071)	0.034	0.303
15	1.25	2.20	0.337	(0.071)	0.034	0.303
16	1.33	2.00	0.306	(0.071)	0.031	0.276
17	1.42	2.60	0.398	(0.071)	0.040	0.358
18	1.50	2.70	0.413	(0.071)	0.041	0.372
19	1.58	2.40	0.367	(0.071)	0.037	0.331
20	1.67	2.70	0.413	(0.071)	0.041	0.372
21	1.75	3.30	0.505	(0.071)	0.051	0.455
22	1.83	3.10	0.475	(0.071)	0.047	0.427
23	1.92	2.90	0.444	(0.071)	0.044	0.400
24	2.00	3.00	0.459	(0.071)	0.046	0.413
25	2.08	3.10	0.475	(0.071)	0.047	0.427
26	2.17	4.20	0.643	(0.071)	0.064	0.579
27	2.25	5.00	0.766	0.071 (0.077)		0.695
28	2.33	3.50	0.536	(0.071)	0.054	0.482
29	2.42	6.80	1.041	0.071 (0.104)		0.970
30	2.50	7.30	1.118	0.071 (0.112)		1.047
31	2.58	8.20	1.256	0.071 (0.126)		1.185
32	2.67	5.90	0.903	0.071 (0.090)		0.833
33	2.75	2.00	0.306	(0.071)	0.031	0.276
34	2.83	1.80	0.276	(0.071)	0.028	0.248

35	2.92	1.80	0.276	(0.071)	0.028	0.248
36	3.00	0.60	0.092	(0.071)	0.009	0.083

(Loss Rate Not Used)

Sum = 100.0 Sum = 13.9

Flood volume = Effective rainfall 1.16(In)
times area 9.6(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)

Total soil loss = 0.11(In)

Total soil loss = 0.092(Ac.Ft)

Total rainfall = 1.28(In)

Flood volume = 40342.0 Cubic Feet

Total soil loss = 3986.4 Cubic Feet

Peak flow rate of this hydrograph = 10.626(CFS)

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3 - 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	5.0	10.0	15.0	20.0
0+ 5	0.0061	0.88	VQ					
0+10	0.0169	1.57	V Q					
0+15	0.0277	1.56	V Q					
0+20	0.0398	1.76	V Q					
0+25	0.0532	1.95	VQ					
0+30	0.0683	2.19	V Q					
0+35	0.0831	2.15	VQ					
0+40	0.0985	2.23	Q					
0+45	0.1148	2.37	Q					
0+50	0.1298	2.18	QV					
0+55	0.1443	2.10	Q V					
1+ 0	0.1598	2.26	Q V					
1+ 5	0.1780	2.64	Q V					
1+10	0.1978	2.87	Q V					
1+15	0.2179	2.92	Q V					
1+20	0.2371	2.79	Q V					
1+25	0.2584	3.09	Q V					
1+30	0.2822	3.46	Q V					
1+35	0.3053	3.36	Q V					
1+40	0.3289	3.43	Q V					
1+45	0.3563	3.97	Q V					
1+50	0.3850	4.17	Q V					
1+55	0.4125	3.99	Q V					
2+ 0	0.4398	3.95	Q V					
2+ 5	0.4677	4.05	Q V					
2+10	0.5011	4.86	Q V					
2+15	0.5426	6.03	Q V					
2+20	0.5807	5.53	Q V					
2+25	0.6305	7.23	Q V					
2+30	0.6949	9.36	Q V					
2+35	0.7681	10.63	Q V					
2+40	0.8340	9.56	Q V					
2+45	0.8723	5.56	Q V					
2+50	0.8934	3.07	Q V					
2+55	0.9108	2.52	Q V					
3+ 0	0.9217	1.58	Q V					
3+ 5	0.9253	0.53	Q V					
3+10	0.9260	0.10	Q V					
3+15	0.9261	0.02	Q V					

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930PR10610.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
PROPOSED CONDITION
10-YEAR 6 HR
DETENTION CALCULATIONS

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.033 Hr.
Lag time = 1.98 Min.
25% of lag time = 0.50 Min.
40% of lag time = 0.79 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	1.20	11.48

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	2.50	23.93

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.735(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.735(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

9.570 69.00 0.900
Total Area Entered = 9.57(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.900	0.071	1.000	0.071
						Sum (F) = 0.071

Area averaged mean soil loss (F) (In/Hr) = 0.071
Minimum soil loss rate ((In/Hr)) = 0.035
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	252.222	51.184	4.937
2 0.167	504.443	39.917	3.850
3 0.250	756.665	6.948	0.670
4 0.333	1008.887	1.951	0.188
		Sum = 100.000	Sum= 9.645

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)		Effective (In/Hr)
			Max	Low	
1	0.08	0.50	(0.071)	0.010	0.094
2	0.17	0.60	(0.071)	0.012	0.112
3	0.25	0.60	(0.071)	0.012	0.112
4	0.33	0.60	(0.071)	0.012	0.112
5	0.42	0.60	(0.071)	0.012	0.112
6	0.50	0.70	(0.071)	0.015	0.131
7	0.58	0.70	(0.071)	0.015	0.131
8	0.67	0.70	(0.071)	0.015	0.131
9	0.75	0.70	(0.071)	0.015	0.131
10	0.83	0.70	(0.071)	0.015	0.131
11	0.92	0.70	(0.071)	0.015	0.131
12	1.00	0.80	(0.071)	0.017	0.150
13	1.08	0.80	(0.071)	0.017	0.150
14	1.17	0.80	(0.071)	0.017	0.150
15	1.25	0.80	(0.071)	0.017	0.150
16	1.33	0.80	(0.071)	0.017	0.150
17	1.42	0.80	(0.071)	0.017	0.150
18	1.50	0.80	(0.071)	0.017	0.150
19	1.58	0.80	(0.071)	0.017	0.150
20	1.67	0.80	(0.071)	0.017	0.150
21	1.75	0.80	(0.071)	0.017	0.150
22	1.83	0.80	(0.071)	0.017	0.150
23	1.92	0.80	(0.071)	0.017	0.150
24	2.00	0.90	(0.071)	0.019	0.169
25	2.08	0.80	(0.071)	0.017	0.150
26	2.17	0.90	(0.071)	0.019	0.169
27	2.25	0.90	(0.071)	0.019	0.169
28	2.33	0.90	(0.071)	0.019	0.169
29	2.42	0.90	(0.071)	0.019	0.169
30	2.50	0.90	(0.071)	0.019	0.169
31	2.58	0.90	(0.071)	0.019	0.169
32	2.67	0.90	(0.071)	0.019	0.169
33	2.75	1.00	(0.071)	0.021	0.187
34	2.83	1.00	(0.071)	0.021	0.187

35	2.92	1.00	0.208	(0.071)	0.021	0.187
36	3.00	1.00	0.208	(0.071)	0.021	0.187
37	3.08	1.00	0.208	(0.071)	0.021	0.187
38	3.17	1.10	0.229	(0.071)	0.023	0.206
39	3.25	1.10	0.229	(0.071)	0.023	0.206
40	3.33	1.10	0.229	(0.071)	0.023	0.206
41	3.42	1.20	0.250	(0.071)	0.025	0.225
42	3.50	1.30	0.271	(0.071)	0.027	0.244
43	3.58	1.40	0.291	(0.071)	0.029	0.262
44	3.67	1.40	0.291	(0.071)	0.029	0.262
45	3.75	1.50	0.312	(0.071)	0.031	0.281
46	3.83	1.50	0.312	(0.071)	0.031	0.281
47	3.92	1.60	0.333	(0.071)	0.033	0.300
48	4.00	1.60	0.333	(0.071)	0.033	0.300
49	4.08	1.70	0.354	(0.071)	0.035	0.319
50	4.17	1.80	0.375	(0.071)	0.037	0.337
51	4.25	1.90	0.396	(0.071)	0.040	0.356
52	4.33	2.00	0.416	(0.071)	0.042	0.375
53	4.42	2.10	0.437	(0.071)	0.044	0.393
54	4.50	2.10	0.437	(0.071)	0.044	0.393
55	4.58	2.20	0.458	(0.071)	0.046	0.412
56	4.67	2.30	0.479	(0.071)	0.048	0.431
57	4.75	2.40	0.500	(0.071)	0.050	0.450
58	4.83	2.40	0.500	(0.071)	0.050	0.450
59	4.92	2.50	0.520	(0.071)	0.052	0.468
60	5.00	2.60	0.541	(0.071)	0.054	0.487
61	5.08	3.10	0.645	(0.071)	0.065	0.581
62	5.17	3.60	0.749	0.071 (0.075)		0.679
63	5.25	3.90	0.812	0.071 (0.081)		0.741
64	5.33	4.20	0.874	0.071 (0.087)		0.803
65	5.42	4.70	0.978	0.071 (0.098)		0.908
66	5.50	5.60	1.166	0.071 (0.117)		1.095
67	5.58	1.90	0.396	(0.071)	0.040	0.356
68	5.67	0.90	0.187	(0.071)	0.019	0.169
69	5.75	0.60	0.125	(0.071)	0.012	0.112
70	5.83	0.50	0.104	(0.071)	0.010	0.094
71	5.92	0.30	0.062	(0.071)	0.006	0.056
72	6.00	0.20	0.042	(0.071)	0.004	0.037

(Loss Rate Not Used)

Sum = 100.0

Sum = 18.8

Flood volume = Effective rainfall 1.57(In)
times area 9.6(Ac.)/[(In)/(Ft.)] = 1.3(Ac.Ft)
Total soil loss = 0.16(In)
Total soil loss = 0.131(Ac.Ft)
Total rainfall = 1.73(In)
Flood volume = 54538.6 Cubic Feet
Total soil loss = 5725.9 Cubic Feet

Peak flow rate of this hydrograph = 9.582(CFS)

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6 - 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	0.0032	0.46	VQ				
0+10	0.0095	0.92	V Q				
0+15	0.0167	1.05	V Q				
0+20	0.0242	1.08	V Q				
0+25	0.0317	1.08	V Q				
0+30	0.0398	1.18	V Q				
0+35	0.0484	1.25	V Q				
0+40	0.0571	1.26	V Q				
0+45	0.0658	1.27	V Q				
0+50	0.0745	1.27	V Q				

0+55	0.0832	1.27	V Q				
1+ 0	0.0926	1.36	V Q				
1+ 5	0.1024	1.43	V Q				
1+10	0.1123	1.44	V Q				
1+15	0.1223	1.45	V Q				
1+20	0.1323	1.45	VQ				
1+25	0.1422	1.45	VQ				
1+30	0.1522	1.45	VQ				
1+35	0.1621	1.45	Q				
1+40	0.1721	1.45	Q				
1+45	0.1821	1.45	Q				
1+50	0.1920	1.45	QV				
1+55	0.2020	1.45	QV				
2+ 0	0.2126	1.54	Q				
2+ 5	0.2231	1.52	QV				
2+10	0.2337	1.55	QV				
2+15	0.2449	1.61	QV				
2+20	0.2560	1.62	Q V				
2+25	0.2672	1.63	Q V				
2+30	0.2784	1.63	Q V				
2+35	0.2897	1.63	Q V				
2+40	0.3009	1.63	Q V				
2+45	0.3127	1.72	Q V				
2+50	0.3250	1.79	Q V				
2+55	0.3375	1.80	Q V				
3+ 0	0.3499	1.81	Q V				
3+ 5	0.3624	1.81	Q V				
3+10	0.3755	1.90	Q V				
3+15	0.3890	1.97	Q V				
3+20	0.4027	1.99	Q V				
3+25	0.4171	2.08	Q V				
3+30	0.4325	2.25	Q V				
3+35	0.4492	2.42	Q V				
3+40	0.4665	2.51	Q V				
3+45	0.4846	2.62	Q V				
3+50	0.5031	2.70	Q V				
3+55	0.5224	2.80	Q V				
4+ 0	0.5422	2.88	Q V				
4+ 5	0.5628	2.98	Q V				
4+10	0.5845	3.15	Q V				
4+15	0.6074	3.33	Q V				
4+20	0.6315	3.51	Q V				
4+25	0.6569	3.69	Q V				
4+30	0.6829	3.78	Q V				
4+35	0.7097	3.89	Q V				
4+40	0.7376	4.05	Q V				
4+45	0.7668	4.23	Q V				
4+50	0.7965	4.32	Q V				
4+55	0.8270	4.43	Q V				
5+ 0	0.8587	4.60	Q V				
5+ 5	0.8941	5.14	Q V				
5+10	0.9354	6.00	Q V				
5+15	0.9820	6.76	Q V				
5+20	1.0328	7.39	Q V				
5+25	1.0893	8.20	Q V				
5+30	1.1553	9.58	Q V				
5+35	1.2017	6.74	Q V				
5+40	1.2231	3.11	Q V				
5+45	1.2345	1.65	Q V				
5+50	1.2419	1.08	Q V				
5+55	1.2470	0.75	Q V				
6+ 0	1.2504	0.49	Q V				
6+ 5	1.2517	0.20	Q V				
6+10	1.2520	0.04	Q V				
6+15	1.2520	0.01	Q V				

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930PR102410.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
PROPOSED CONDITION
10-YEAR 24 HR
DETENTION CALCULATIONS

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.033 Hr.
Lag time = 1.98 Min.
25% of lag time = 0.50 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]
9.57	1.90	18.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	4.20	40.19

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.900(In)
Area Averaged 100-Year Rainfall = 4.200(In)

Point rain (area averaged) = 2.846(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.846(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

9.570 69.00 0.900
Total Area Entered = 9.57(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.900	0.071	1.000	0.071
						Sum (F) = 0.071

Area averaged mean soil loss (F) (In/Hr) = 0.071
Minimum soil loss rate ((In/Hr)) = 0.035
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.100

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	252.222	51.184	4.937
2 0.167	504.443	39.917	3.850
3 0.250	756.665	6.948	0.670
4 0.333	1008.887	1.951	0.188
		Sum = 100.000	Sum= 9.645

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)		Effective (In/Hr)
			Max	Low	
1	0.08	0.07	(0.126)	0.002	0.020
2	0.17	0.07	(0.125)	0.002	0.020
3	0.25	0.07	(0.125)	0.002	0.020
4	0.33	0.10	(0.124)	0.003	0.031
5	0.42	0.10	(0.124)	0.003	0.031
6	0.50	0.10	(0.123)	0.003	0.031
7	0.58	0.10	(0.123)	0.003	0.031
8	0.67	0.10	(0.122)	0.003	0.031
9	0.75	0.10	(0.122)	0.003	0.031
10	0.83	0.13	(0.121)	0.005	0.041
11	0.92	0.13	(0.121)	0.005	0.041
12	1.00	0.13	(0.120)	0.005	0.041
13	1.08	0.10	(0.120)	0.003	0.031
14	1.17	0.10	(0.119)	0.003	0.031
15	1.25	0.10	(0.119)	0.003	0.031
16	1.33	0.10	(0.118)	0.003	0.031
17	1.42	0.10	(0.118)	0.003	0.031
18	1.50	0.10	(0.117)	0.003	0.031
19	1.58	0.10	(0.117)	0.003	0.031
20	1.67	0.10	(0.117)	0.003	0.031
21	1.75	0.10	(0.116)	0.003	0.031
22	1.83	0.13	(0.116)	0.005	0.041
23	1.92	0.13	(0.115)	0.005	0.041
24	2.00	0.13	(0.115)	0.005	0.041
25	2.08	0.13	(0.114)	0.005	0.041
26	2.17	0.13	(0.114)	0.005	0.041
27	2.25	0.13	(0.113)	0.005	0.041
28	2.33	0.13	(0.113)	0.005	0.041
29	2.42	0.13	(0.112)	0.005	0.041
30	2.50	0.13	(0.112)	0.005	0.041
31	2.58	0.17	(0.111)	0.006	0.051
32	2.67	0.17	(0.111)	0.006	0.051
33	2.75	0.17	(0.110)	0.006	0.051
34	2.83	0.17	(0.110)	0.006	0.051

35	2.92	0.17	0.057	(0.110)	0.006	0.051
36	3.00	0.17	0.057	(0.109)	0.006	0.051
37	3.08	0.17	0.057	(0.109)	0.006	0.051
38	3.17	0.17	0.057	(0.108)	0.006	0.051
39	3.25	0.17	0.057	(0.108)	0.006	0.051
40	3.33	0.17	0.057	(0.107)	0.006	0.051
41	3.42	0.17	0.057	(0.107)	0.006	0.051
42	3.50	0.17	0.057	(0.106)	0.006	0.051
43	3.58	0.17	0.057	(0.106)	0.006	0.051
44	3.67	0.17	0.057	(0.106)	0.006	0.051
45	3.75	0.17	0.057	(0.105)	0.006	0.051
46	3.83	0.20	0.068	(0.105)	0.007	0.061
47	3.92	0.20	0.068	(0.104)	0.007	0.061
48	4.00	0.20	0.068	(0.104)	0.007	0.061
49	4.08	0.20	0.068	(0.103)	0.007	0.061
50	4.17	0.20	0.068	(0.103)	0.007	0.061
51	4.25	0.20	0.068	(0.102)	0.007	0.061
52	4.33	0.23	0.080	(0.102)	0.008	0.072
53	4.42	0.23	0.080	(0.102)	0.008	0.072
54	4.50	0.23	0.080	(0.101)	0.008	0.072
55	4.58	0.23	0.080	(0.101)	0.008	0.072
56	4.67	0.23	0.080	(0.100)	0.008	0.072
57	4.75	0.23	0.080	(0.100)	0.008	0.072
58	4.83	0.27	0.091	(0.099)	0.009	0.082
59	4.92	0.27	0.091	(0.099)	0.009	0.082
60	5.00	0.27	0.091	(0.099)	0.009	0.082
61	5.08	0.20	0.068	(0.098)	0.007	0.061
62	5.17	0.20	0.068	(0.098)	0.007	0.061
63	5.25	0.20	0.068	(0.097)	0.007	0.061
64	5.33	0.23	0.080	(0.097)	0.008	0.072
65	5.42	0.23	0.080	(0.096)	0.008	0.072
66	5.50	0.23	0.080	(0.096)	0.008	0.072
67	5.58	0.27	0.091	(0.096)	0.009	0.082
68	5.67	0.27	0.091	(0.095)	0.009	0.082
69	5.75	0.27	0.091	(0.095)	0.009	0.082
70	5.83	0.27	0.091	(0.094)	0.009	0.082
71	5.92	0.27	0.091	(0.094)	0.009	0.082
72	6.00	0.27	0.091	(0.093)	0.009	0.082
73	6.08	0.30	0.102	(0.093)	0.010	0.092
74	6.17	0.30	0.102	(0.093)	0.010	0.092
75	6.25	0.30	0.102	(0.092)	0.010	0.092
76	6.33	0.30	0.102	(0.092)	0.010	0.092
77	6.42	0.30	0.102	(0.091)	0.010	0.092
78	6.50	0.30	0.102	(0.091)	0.010	0.092
79	6.58	0.33	0.114	(0.091)	0.011	0.102
80	6.67	0.33	0.114	(0.090)	0.011	0.102
81	6.75	0.33	0.114	(0.090)	0.011	0.102
82	6.83	0.33	0.114	(0.089)	0.011	0.102
83	6.92	0.33	0.114	(0.089)	0.011	0.102
84	7.00	0.33	0.114	(0.089)	0.011	0.102
85	7.08	0.33	0.114	(0.088)	0.011	0.102
86	7.17	0.33	0.114	(0.088)	0.011	0.102
87	7.25	0.33	0.114	(0.087)	0.011	0.102
88	7.33	0.37	0.125	(0.087)	0.013	0.113
89	7.42	0.37	0.125	(0.087)	0.013	0.113
90	7.50	0.37	0.125	(0.086)	0.013	0.113
91	7.58	0.40	0.137	(0.086)	0.014	0.123
92	7.67	0.40	0.137	(0.085)	0.014	0.123
93	7.75	0.40	0.137	(0.085)	0.014	0.123
94	7.83	0.43	0.148	(0.085)	0.015	0.133
95	7.92	0.43	0.148	(0.084)	0.015	0.133
96	8.00	0.43	0.148	(0.084)	0.015	0.133
97	8.08	0.50	0.171	(0.083)	0.017	0.154
98	8.17	0.50	0.171	(0.083)	0.017	0.154
99	8.25	0.50	0.171	(0.083)	0.017	0.154
100	8.33	0.50	0.171	(0.082)	0.017	0.154
101	8.42	0.50	0.171	(0.082)	0.017	0.154
102	8.50	0.50	0.171	(0.082)	0.017	0.154
103	8.58	0.53	0.182	(0.081)	0.018	0.164

104	8.67	0.53	0.182	(0.081)	0.018	0.164
105	8.75	0.53	0.182	(0.080)	0.018	0.164
106	8.83	0.57	0.194	(0.080)	0.019	0.174
107	8.92	0.57	0.194	(0.080)	0.019	0.174
108	9.00	0.57	0.194	(0.079)	0.019	0.174
109	9.08	0.63	0.216	(0.079)	0.022	0.195
110	9.17	0.63	0.216	(0.078)	0.022	0.195
111	9.25	0.63	0.216	(0.078)	0.022	0.195
112	9.33	0.67	0.228	(0.078)	0.023	0.205
113	9.42	0.67	0.228	(0.077)	0.023	0.205
114	9.50	0.67	0.228	(0.077)	0.023	0.205
115	9.58	0.70	0.239	(0.077)	0.024	0.215
116	9.67	0.70	0.239	(0.076)	0.024	0.215
117	9.75	0.70	0.239	(0.076)	0.024	0.215
118	9.83	0.73	0.250	(0.076)	0.025	0.225
119	9.92	0.73	0.250	(0.075)	0.025	0.225
120	10.00	0.73	0.250	(0.075)	0.025	0.225
121	10.08	0.50	0.171	(0.074)	0.017	0.154
122	10.17	0.50	0.171	(0.074)	0.017	0.154
123	10.25	0.50	0.171	(0.074)	0.017	0.154
124	10.33	0.50	0.171	(0.073)	0.017	0.154
125	10.42	0.50	0.171	(0.073)	0.017	0.154
126	10.50	0.50	0.171	(0.073)	0.017	0.154
127	10.58	0.67	0.228	(0.072)	0.023	0.205
128	10.67	0.67	0.228	(0.072)	0.023	0.205
129	10.75	0.67	0.228	(0.072)	0.023	0.205
130	10.83	0.67	0.228	(0.071)	0.023	0.205
131	10.92	0.67	0.228	(0.071)	0.023	0.205
132	11.00	0.67	0.228	(0.071)	0.023	0.205
133	11.08	0.63	0.216	(0.070)	0.022	0.195
134	11.17	0.63	0.216	(0.070)	0.022	0.195
135	11.25	0.63	0.216	(0.069)	0.022	0.195
136	11.33	0.63	0.216	(0.069)	0.022	0.195
137	11.42	0.63	0.216	(0.069)	0.022	0.195
138	11.50	0.63	0.216	(0.068)	0.022	0.195
139	11.58	0.57	0.194	(0.068)	0.019	0.174
140	11.67	0.57	0.194	(0.068)	0.019	0.174
141	11.75	0.57	0.194	(0.067)	0.019	0.174
142	11.83	0.60	0.205	(0.067)	0.020	0.184
143	11.92	0.60	0.205	(0.067)	0.020	0.184
144	12.00	0.60	0.205	(0.066)	0.020	0.184
145	12.08	0.83	0.285	(0.066)	0.028	0.256
146	12.17	0.83	0.285	(0.066)	0.028	0.256
147	12.25	0.83	0.285	(0.065)	0.028	0.256
148	12.33	0.87	0.296	(0.065)	0.030	0.266
149	12.42	0.87	0.296	(0.065)	0.030	0.266
150	12.50	0.87	0.296	(0.064)	0.030	0.266
151	12.58	0.93	0.319	(0.064)	0.032	0.287
152	12.67	0.93	0.319	(0.064)	0.032	0.287
153	12.75	0.93	0.319	(0.064)	0.032	0.287
154	12.83	0.97	0.330	(0.063)	0.033	0.297
155	12.92	0.97	0.330	(0.063)	0.033	0.297
156	13.00	0.97	0.330	(0.063)	0.033	0.297
157	13.08	1.13	0.387	(0.062)	0.039	0.348
158	13.17	1.13	0.387	(0.062)	0.039	0.348
159	13.25	1.13	0.387	(0.062)	0.039	0.348
160	13.33	1.13	0.387	(0.061)	0.039	0.348
161	13.42	1.13	0.387	(0.061)	0.039	0.348
162	13.50	1.13	0.387	(0.061)	0.039	0.348
163	13.58	0.77	0.262	(0.060)	0.026	0.236
164	13.67	0.77	0.262	(0.060)	0.026	0.236
165	13.75	0.77	0.262	(0.060)	0.026	0.236
166	13.83	0.77	0.262	(0.059)	0.026	0.236
167	13.92	0.77	0.262	(0.059)	0.026	0.236
168	14.00	0.77	0.262	(0.059)	0.026	0.236
169	14.08	0.90	0.307	(0.059)	0.031	0.277
170	14.17	0.90	0.307	(0.058)	0.031	0.277
171	14.25	0.90	0.307	(0.058)	0.031	0.277
172	14.33	0.87	0.296	(0.058)	0.030	0.266

173	14.42	0.87	0.296	(0.057)	0.030	0.266
174	14.50	0.87	0.296	(0.057)	0.030	0.266
175	14.58	0.87	0.296	(0.057)	0.030	0.266
176	14.67	0.87	0.296	(0.056)	0.030	0.266
177	14.75	0.87	0.296	(0.056)	0.030	0.266
178	14.83	0.83	0.285	(0.056)	0.028	0.256
179	14.92	0.83	0.285	(0.056)	0.028	0.256
180	15.00	0.83	0.285	(0.055)	0.028	0.256
181	15.08	0.80	0.273	(0.055)	0.027	0.246
182	15.17	0.80	0.273	(0.055)	0.027	0.246
183	15.25	0.80	0.273	(0.054)	0.027	0.246
184	15.33	0.77	0.262	(0.054)	0.026	0.236
185	15.42	0.77	0.262	(0.054)	0.026	0.236
186	15.50	0.77	0.262	(0.054)	0.026	0.236
187	15.58	0.63	0.216	(0.053)	0.022	0.195
188	15.67	0.63	0.216	(0.053)	0.022	0.195
189	15.75	0.63	0.216	(0.053)	0.022	0.195
190	15.83	0.63	0.216	(0.053)	0.022	0.195
191	15.92	0.63	0.216	(0.052)	0.022	0.195
192	16.00	0.63	0.216	(0.052)	0.022	0.195
193	16.08	0.13	0.046	(0.052)	0.005	0.041
194	16.17	0.13	0.046	(0.051)	0.005	0.041
195	16.25	0.13	0.046	(0.051)	0.005	0.041
196	16.33	0.13	0.046	(0.051)	0.005	0.041
197	16.42	0.13	0.046	(0.051)	0.005	0.041
198	16.50	0.13	0.046	(0.050)	0.005	0.041
199	16.58	0.10	0.034	(0.050)	0.003	0.031
200	16.67	0.10	0.034	(0.050)	0.003	0.031
201	16.75	0.10	0.034	(0.050)	0.003	0.031
202	16.83	0.10	0.034	(0.049)	0.003	0.031
203	16.92	0.10	0.034	(0.049)	0.003	0.031
204	17.00	0.10	0.034	(0.049)	0.003	0.031
205	17.08	0.17	0.057	(0.049)	0.006	0.051
206	17.17	0.17	0.057	(0.048)	0.006	0.051
207	17.25	0.17	0.057	(0.048)	0.006	0.051
208	17.33	0.17	0.057	(0.048)	0.006	0.051
209	17.42	0.17	0.057	(0.048)	0.006	0.051
210	17.50	0.17	0.057	(0.047)	0.006	0.051
211	17.58	0.17	0.057	(0.047)	0.006	0.051
212	17.67	0.17	0.057	(0.047)	0.006	0.051
213	17.75	0.17	0.057	(0.047)	0.006	0.051
214	17.83	0.13	0.046	(0.047)	0.005	0.041
215	17.92	0.13	0.046	(0.046)	0.005	0.041
216	18.00	0.13	0.046	(0.046)	0.005	0.041
217	18.08	0.13	0.046	(0.046)	0.005	0.041
218	18.17	0.13	0.046	(0.046)	0.005	0.041
219	18.25	0.13	0.046	(0.045)	0.005	0.041
220	18.33	0.13	0.046	(0.045)	0.005	0.041
221	18.42	0.13	0.046	(0.045)	0.005	0.041
222	18.50	0.13	0.046	(0.045)	0.005	0.041
223	18.58	0.10	0.034	(0.045)	0.003	0.031
224	18.67	0.10	0.034	(0.044)	0.003	0.031
225	18.75	0.10	0.034	(0.044)	0.003	0.031
226	18.83	0.07	0.023	(0.044)	0.002	0.020
227	18.92	0.07	0.023	(0.044)	0.002	0.020
228	19.00	0.07	0.023	(0.043)	0.002	0.020
229	19.08	0.10	0.034	(0.043)	0.003	0.031
230	19.17	0.10	0.034	(0.043)	0.003	0.031
231	19.25	0.10	0.034	(0.043)	0.003	0.031
232	19.33	0.13	0.046	(0.043)	0.005	0.041
233	19.42	0.13	0.046	(0.042)	0.005	0.041
234	19.50	0.13	0.046	(0.042)	0.005	0.041
235	19.58	0.10	0.034	(0.042)	0.003	0.031
236	19.67	0.10	0.034	(0.042)	0.003	0.031
237	19.75	0.10	0.034	(0.042)	0.003	0.031
238	19.83	0.07	0.023	(0.041)	0.002	0.020
239	19.92	0.07	0.023	(0.041)	0.002	0.020
240	20.00	0.07	0.023	(0.041)	0.002	0.020
241	20.08	0.10	0.034	(0.041)	0.003	0.031

242	20.17	0.10	0.034	(0.041)	0.003	0.031
243	20.25	0.10	0.034	(0.041)	0.003	0.031
244	20.33	0.10	0.034	(0.040)	0.003	0.031
245	20.42	0.10	0.034	(0.040)	0.003	0.031
246	20.50	0.10	0.034	(0.040)	0.003	0.031
247	20.58	0.10	0.034	(0.040)	0.003	0.031
248	20.67	0.10	0.034	(0.040)	0.003	0.031
249	20.75	0.10	0.034	(0.040)	0.003	0.031
250	20.83	0.07	0.023	(0.039)	0.002	0.020
251	20.92	0.07	0.023	(0.039)	0.002	0.020
252	21.00	0.07	0.023	(0.039)	0.002	0.020
253	21.08	0.10	0.034	(0.039)	0.003	0.031
254	21.17	0.10	0.034	(0.039)	0.003	0.031
255	21.25	0.10	0.034	(0.039)	0.003	0.031
256	21.33	0.07	0.023	(0.038)	0.002	0.020
257	21.42	0.07	0.023	(0.038)	0.002	0.020
258	21.50	0.07	0.023	(0.038)	0.002	0.020
259	21.58	0.10	0.034	(0.038)	0.003	0.031
260	21.67	0.10	0.034	(0.038)	0.003	0.031
261	21.75	0.10	0.034	(0.038)	0.003	0.031
262	21.83	0.07	0.023	(0.038)	0.002	0.020
263	21.92	0.07	0.023	(0.038)	0.002	0.020
264	22.00	0.07	0.023	(0.037)	0.002	0.020
265	22.08	0.10	0.034	(0.037)	0.003	0.031
266	22.17	0.10	0.034	(0.037)	0.003	0.031
267	22.25	0.10	0.034	(0.037)	0.003	0.031
268	22.33	0.07	0.023	(0.037)	0.002	0.020
269	22.42	0.07	0.023	(0.037)	0.002	0.020
270	22.50	0.07	0.023	(0.037)	0.002	0.020
271	22.58	0.07	0.023	(0.037)	0.002	0.020
272	22.67	0.07	0.023	(0.036)	0.002	0.020
273	22.75	0.07	0.023	(0.036)	0.002	0.020
274	22.83	0.07	0.023	(0.036)	0.002	0.020
275	22.92	0.07	0.023	(0.036)	0.002	0.020
276	23.00	0.07	0.023	(0.036)	0.002	0.020
277	23.08	0.07	0.023	(0.036)	0.002	0.020
278	23.17	0.07	0.023	(0.036)	0.002	0.020
279	23.25	0.07	0.023	(0.036)	0.002	0.020
280	23.33	0.07	0.023	(0.036)	0.002	0.020
281	23.42	0.07	0.023	(0.036)	0.002	0.020
282	23.50	0.07	0.023	(0.036)	0.002	0.020
283	23.58	0.07	0.023	(0.036)	0.002	0.020
284	23.67	0.07	0.023	(0.036)	0.002	0.020
285	23.75	0.07	0.023	(0.036)	0.002	0.020
286	23.83	0.07	0.023	(0.035)	0.002	0.020
287	23.92	0.07	0.023	(0.035)	0.002	0.020
288	24.00	0.07	0.023	(0.035)	0.002	0.020

(Loss Rate Not Used)

Sum = 100.0

Sum = 30.7

Flood volume = Effective rainfall 2.56(In)
times area 9.6(Ac.)/[(In)/(Ft.)] = 2.0(Ac.Ft)
Total soil loss = 0.28(In)
Total soil loss = 0.227(Ac.Ft)
Total rainfall = 2.85(In)
Flood volume = 88986.5 Cubic Feet
Total soil loss = 9887.4 Cubic Feet

Peak flow rate of this hydrograph = 3.362(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 0.0007 0.10 Q | | | |

0+10	0.0019	0.18	Q				
0+15	0.0033	0.19	Q				
0+20	0.0050	0.25	Q				
0+25	0.0070	0.29	VQ				
0+30	0.0090	0.29	VQ				
0+35	0.0110	0.30	VQ				
0+40	0.0131	0.30	VQ				
0+45	0.0151	0.30	VQ				
0+50	0.0175	0.35	VQ				
0+55	0.0202	0.39	VQ				
1+ 0	0.0229	0.39	VQ				
1+ 5	0.0253	0.34	VQ				
1+10	0.0274	0.31	VQ				
1+15	0.0294	0.30	VQ				
1+20	0.0315	0.30	VQ				
1+25	0.0335	0.30	VQ				
1+30	0.0356	0.30	VQ				
1+35	0.0376	0.30	VQ				
1+40	0.0396	0.30	VQ				
1+45	0.0417	0.30	VQ				
1+50	0.0441	0.35	VQ				
1+55	0.0467	0.39	VQ				
2+ 0	0.0494	0.39	VQ				
2+ 5	0.0522	0.40	Q				
2+10	0.0549	0.40	Q				
2+15	0.0576	0.40	Q				
2+20	0.0603	0.40	Q				
2+25	0.0631	0.40	Q				
2+30	0.0658	0.40	Q				
2+35	0.0689	0.45	Q				
2+40	0.0722	0.49	Q				
2+45	0.0756	0.49	Q				
2+50	0.0790	0.49	Q				
2+55	0.0824	0.49	Q				
3+ 0	0.0858	0.49	Q				
3+ 5	0.0892	0.49	Q				
3+10	0.0926	0.49	Q				
3+15	0.0960	0.49	Q				
3+20	0.0994	0.49	Q				
3+25	0.1028	0.49	QV				
3+30	0.1062	0.49	QV				
3+35	0.1096	0.49	QV				
3+40	0.1130	0.49	QV				
3+45	0.1165	0.49	QV				
3+50	0.1202	0.54	Q				
3+55	0.1242	0.58	Q				
4+ 0	0.1283	0.59	Q				
4+ 5	0.1324	0.59	Q				
4+10	0.1365	0.59	Q				
4+15	0.1406	0.59	Q				
4+20	0.1450	0.64	Q				
4+25	0.1497	0.68	Q				
4+30	0.1545	0.69	QV				
4+35	0.1592	0.69	QV				
4+40	0.1640	0.69	QV				
4+45	0.1688	0.69	QV				
4+50	0.1739	0.74	QV				
4+55	0.1793	0.78	Q				
5+ 0	0.1847	0.79	Q				
5+ 5	0.1894	0.69	QV				
5+10	0.1936	0.61	QV				
5+15	0.1978	0.60	QV				
5+20	0.2022	0.64	QV				
5+25	0.2069	0.68	Q V				
5+30	0.2117	0.69	Q V				
5+35	0.2168	0.74	Q V				
5+40	0.2222	0.78	QV				
5+45	0.2276	0.79	QV				
5+50	0.2330	0.79	QV				

5+55	0.2385	0.79	QV				
6+ 0	0.2439	0.79	QV				
6+ 5	0.2497	0.84	QV				
6+10	0.2558	0.88	Q V				
6+15	0.2619	0.89	Q V				
6+20	0.2680	0.89	Q V				
6+25	0.2742	0.89	Q V				
6+30	0.2803	0.89	Q V				
6+35	0.2868	0.94	Q V				
6+40	0.2935	0.98	Q V				
6+45	0.3003	0.99	Q V				
6+50	0.3071	0.99	Q V				
6+55	0.3139	0.99	Q V				
7+ 0	0.3208	0.99	Q V				
7+ 5	0.3276	0.99	Q V				
7+10	0.3344	0.99	Q V				
7+15	0.3412	0.99	Q V				
7+20	0.3483	1.04	Q V				
7+25	0.3558	1.08	Q V				
7+30	0.3632	1.09	Q V				
7+35	0.3711	1.14	Q V				
7+40	0.3792	1.18	Q V				
7+45	0.3874	1.18	Q V				
7+50	0.3959	1.24	Q V				
7+55	0.4047	1.28	Q V				
8+ 0	0.4135	1.28	Q V				
8+ 5	0.4231	1.39	Q V				
8+10	0.4331	1.47	Q V				
8+15	0.4433	1.48	Q V				
8+20	0.4535	1.48	Q V				
8+25	0.4638	1.48	Q V				
8+30	0.4740	1.48	Q V				
8+35	0.4845	1.53	Q V				
8+40	0.4954	1.57	Q V				
8+45	0.5063	1.58	Q V				
8+50	0.5175	1.63	Q V				
8+55	0.5290	1.67	Q V				
9+ 0	0.5406	1.68	Q V				
9+ 5	0.5528	1.78	Q V				
9+10	0.5657	1.86	Q V				
9+15	0.5786	1.87	Q V				
9+20	0.5919	1.93	Q V				
9+25	0.6054	1.97	Q V				
9+30	0.6190	1.98	Q V				
9+35	0.6330	2.03	Q V				
9+40	0.6472	2.07	Q V				
9+45	0.6615	2.07	Q V				
9+50	0.6762	2.13	Q V				
9+55	0.6911	2.17	Q V				
10+ 0	0.7061	2.17	Q V				
10+ 5	0.7186	1.82	Q V				
10+10	0.7292	1.54	Q V				
10+15	0.7395	1.50	Q V				
10+20	0.7498	1.48	Q V				
10+25	0.7600	1.48	Q V				
10+30	0.7702	1.48	Q V				
10+35	0.7821	1.74	Q V				
10+40	0.7955	1.93	Q V				
10+45	0.8090	1.97	Q V				
10+50	0.8226	1.98	Q V				
10+55	0.8363	1.98	Q V				
11+ 0	0.8499	1.98	Q V				
11+ 5	0.8631	1.93	Q V				
11+10	0.8761	1.89	Q V				
11+15	0.8891	1.88	Q V				
11+20	0.9020	1.88	Q V				
11+25	0.9150	1.88	Q V				
11+30	0.9279	1.88	Q V				
11+35	0.9401	1.78	Q V				

11+40	0.9518	1.70	Q		V			
11+45	0.9634	1.68	Q		V			
11+50	0.9754	1.73	Q		V			
11+55	0.9876	1.77	Q		V			
12+ 0	0.9998	1.78	Q		V			
12+ 5	1.0145	2.13	Q		V			
12+10	1.0311	2.41	Q		V			
12+15	1.0480	2.46	Q		V			
12+20	1.0654	2.52	Q		V			
12+25	1.0831	2.56	Q		V			
12+30	1.1007	2.57	Q		V			
12+35	1.1191	2.67	Q		V			
12+40	1.1381	2.75	Q		V			
12+45	1.1571	2.76	Q		V			
12+50	1.1765	2.82	Q		V			
12+55	1.1962	2.86	Q		V			
13+ 0	1.2160	2.87	Q		V			
13+ 5	1.2375	3.12	Q		V			
13+10	1.2603	3.32	Q		V			
13+15	1.2834	3.35	Q		V			
13+20	1.3065	3.36	Q		V			
13+25	1.3297	3.36	Q		V			
13+30	1.3529	3.36	Q		V			
13+35	1.3722	2.81	Q		V			
13+40	1.3885	2.37	Q		V			
13+45	1.4043	2.30	Q		V			
13+50	1.4200	2.27	Q		V			
13+55	1.4356	2.27	Q		V			
14+ 0	1.4513	2.27	Q		V			
14+ 5	1.4683	2.48	Q		V			
14+10	1.4865	2.63	Q		V			
14+15	1.5048	2.66	Q		V			
14+20	1.5229	2.62	Q		V			
14+25	1.5406	2.58	Q		V			
14+30	1.5583	2.57	Q		V			
14+35	1.5760	2.57	Q		V			
14+40	1.5938	2.57	Q		V			
14+45	1.6115	2.57	Q		V			
14+50	1.6288	2.52	Q		V			
14+55	1.6459	2.48	Q		V			
15+ 0	1.6629	2.47	Q		V			
15+ 5	1.6796	2.42	Q		V			
15+10	1.6960	2.38	Q		V			
15+15	1.7124	2.37	Q		V			
15+20	1.7284	2.32	Q		V			
15+25	1.7441	2.28	Q		V			
15+30	1.7598	2.28	Q		V			
15+35	1.7740	2.07	Q		V			
15+40	1.7872	1.91	Q		V			
15+45	1.8002	1.89	Q		V			
15+50	1.8131	1.88	Q		V			
15+55	1.8261	1.88	Q		V			
16+ 0	1.8390	1.88	Q		V			
16+ 5	1.8467	1.12	Q		V			
16+10	1.8504	0.53	Q		V			
16+15	1.8533	0.42	Q		V			
16+20	1.8560	0.40	Q		V			
16+25	1.8587	0.40	Q		V			
16+30	1.8615	0.40	Q		V			
16+35	1.8638	0.34	Q		V			
16+40	1.8659	0.31	Q		V			
16+45	1.8680	0.30	Q		V			
16+50	1.8700	0.30	Q		V			
16+55	1.8721	0.30	Q		V			
17+ 0	1.8741	0.30	Q		V			
17+ 5	1.8769	0.40	Q		V			
17+10	1.8801	0.48	Q		V			
17+15	1.8835	0.49	Q		V			
17+20	1.8869	0.49	Q		V			

17+25	1.8903	0.49	Q				V
17+30	1.8937	0.49	Q				V
17+35	1.8971	0.49	Q				V
17+40	1.9005	0.49	Q				V
17+45	1.9039	0.49	Q				V
17+50	1.9070	0.44	Q				V
17+55	1.9098	0.40	Q				V
18+ 0	1.9125	0.40	Q				V
18+ 5	1.9152	0.40	Q				V
18+10	1.9180	0.40	Q				V
18+15	1.9207	0.40	Q				V
18+20	1.9234	0.40	Q				V
18+25	1.9261	0.40	Q				V
18+30	1.9289	0.40	Q				V
18+35	1.9312	0.34	Q				V
18+40	1.9333	0.31	Q				V
18+45	1.9354	0.30	Q				V
18+50	1.9371	0.25	Q				V
18+55	1.9385	0.21	Q				V
19+ 0	1.9399	0.20	Q				V
19+ 5	1.9416	0.25	Q				V
19+10	1.9436	0.29	Q				V
19+15	1.9456	0.29	Q				V
19+20	1.9480	0.35	Q				V
19+25	1.9507	0.39	Q				V
19+30	1.9534	0.39	Q				V
19+35	1.9558	0.34	Q				V
19+40	1.9579	0.31	Q				V
19+45	1.9599	0.30	Q				V
19+50	1.9616	0.25	Q				V
19+55	1.9630	0.21	Q				V
20+ 0	1.9644	0.20	Q				V
20+ 5	1.9661	0.25	Q				V
20+10	1.9681	0.29	Q				V
20+15	1.9701	0.29	Q				V
20+20	1.9722	0.30	Q				V
20+25	1.9742	0.30	Q				V
20+30	1.9763	0.30	Q				V
20+35	1.9783	0.30	Q				V
20+40	1.9803	0.30	Q				V
20+45	1.9824	0.30	Q				V
20+50	1.9841	0.25	Q				V
20+55	1.9855	0.21	Q				V
21+ 0	1.9869	0.20	Q				V
21+ 5	1.9886	0.25	Q				V
21+10	1.9906	0.29	Q				V
21+15	1.9926	0.29	Q				V
21+20	1.9943	0.25	Q				V
21+25	1.9957	0.21	Q				V
21+30	1.9971	0.20	Q				V
21+35	1.9988	0.25	Q				V
21+40	2.0008	0.29	Q				V
21+45	2.0028	0.29	Q				V
21+50	2.0045	0.25	Q				V
21+55	2.0059	0.21	Q				V
22+ 0	2.0073	0.20	Q				V
22+ 5	2.0090	0.25	Q				V
22+10	2.0110	0.29	Q				V
22+15	2.0130	0.29	Q				V
22+20	2.0147	0.25	Q				V
22+25	2.0161	0.21	Q				V
22+30	2.0175	0.20	Q				V
22+35	2.0189	0.20	Q				V
22+40	2.0202	0.20	Q				V
22+45	2.0216	0.20	Q				V
22+50	2.0230	0.20	Q				V
22+55	2.0243	0.20	Q				V
23+ 0	2.0257	0.20	Q				V
23+ 5	2.0271	0.20	Q				V

23+10	2.0284	0.20	Q				V
23+15	2.0298	0.20	Q				V
23+20	2.0311	0.20	Q				V
23+25	2.0325	0.20	Q				V
23+30	2.0339	0.20	Q				V
23+35	2.0352	0.20	Q				V
23+40	2.0366	0.20	Q				V
23+45	2.0380	0.20	Q				V
23+50	2.0393	0.20	Q				V
23+55	2.0407	0.20	Q				V
24+ 0	2.0420	0.20	Q				V
24+ 5	2.0427	0.10	Q				V
24+10	2.0428	0.02	Q				V
24+15	2.0428	0.00	Q				V

EXISTING CONDITION HYDROGRAPHS
(10-YEAR 1HR, 3HR, 6HR & 24HR EVENTS)

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930EX10110.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
EXISTING CONDITION
10-YEAR 1 HR

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.066 Hr.
Lag time = 3.96 Min.
25% of lag time = 0.99 Min.
40% of lag time = 1.59 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	0.50	4.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	1.20	11.48

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.500(In)
Area Averaged 100-Year Rainfall = 1.200(In)

Point rain (area averaged) = 0.788(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 0.788(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

1.750	69.00	0.500
7.820	77.00	0.000
Total Area Entered = 9.57(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.500	0.205	0.183	0.037
77.0	77.0	0.279	0.000	0.279	0.817	0.228
Sum (F) =						0.266

Area averaged mean soil loss (F) (In/Hr) = 0.266

Minimum soil loss rate ((In/Hr)) = 0.133

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5000

Unit Hydrograph VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	126.111	26.943	2.599
2 0.167	252.222	48.482	4.676
3 0.250	378.333	12.799	1.234
4 0.333	504.443	5.754	0.555
5 0.417	630.554	3.189	0.308
6 0.500	756.665	1.763	0.170
7 0.583	882.776	1.070	0.103
Sum = 100.000			Sum= 9.645

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	4.20	0.397	0.266 (0.357)	0.131
2 0.17	4.30	0.407	0.266 (0.366)	0.141
3 0.25	5.00	0.473	0.266 (0.425)	0.207
4 0.33	5.00	0.473	0.266 (0.425)	0.207
5 0.42	5.80	0.548	0.266 (0.494)	0.283
6 0.50	6.50	0.615	0.266 (0.553)	0.349
7 0.58	7.40	0.700	0.266 (0.630)	0.434
8 0.67	8.60	0.813	0.266 (0.732)	0.547
9 0.75	12.30	1.163	0.266 (1.047)	0.897
10 0.83	29.10	2.751	0.266 (2.476)	2.486
11 0.92	6.80	0.643	0.266 (0.579)	0.377
12 1.00	5.00	0.473	0.266 (0.425)	0.207

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.3

Flood volume = Effective rainfall 0.52(In)
times area 9.6(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)

Total soil loss = 0.27(In)

Total soil loss = 0.212(Ac.Ft)

Total rainfall = 0.79(In)

Flood volume = 18137.8 Cubic Feet

Total soil loss = 9233.7 Cubic Feet

Peak flow rate of this hydrograph = 14.243(CFS)

1 - 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	5.0	10.0	15.0	20.0
0+ 5	0.0024	0.34	Q					
0+10	0.0091	0.98	VQ					
0+15	0.0185	1.36	VQ					
0+20	0.0305	1.75	VQ					
0+25	0.0448	2.08	Q					
0+30	0.0632	2.67	QV					
0+35	0.0861	3.32	Q V					
0+40	0.1147	4.15	Q		V			
0+45	0.1544	5.77	Q		V			
0+50	0.2354	11.75				VQ		
0+55	0.3335	14.24					Q	V
1+ 0	0.3758	6.15			Q			V
1+ 5	0.3980	3.23	Q					V
1+10	0.4079	1.44	Q					V
1+15	0.4131	0.75	Q					V
1+20	0.4157	0.38	Q					V
1+25	0.4162	0.07	Q					V
1+30	0.4164	0.02	Q					V

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930EX10310.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
EXISTING CONDITION
10-YEAR 3 HR

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.066 Hr.
Lag time = 3.96 Min.
25% of lag time = 0.99 Min.
40% of lag time = 1.59 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	0.84	8.04

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	1.90	18.18

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.840(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.276(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.276(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

1.750	69.00	0.500
7.820	77.00	0.000
Total Area Entered =		9.57(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.500	0.205	0.183	0.037
77.0	77.0	0.279	0.000	0.279	0.817	0.228
Sum (F) =						0.266

Area averaged mean soil loss (F) (In/Hr) = 0.266

Minimum soil loss rate ((In/Hr)) = 0.133

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	126.111	26.943	2.599
2 0.167	252.222	48.482	4.676
3 0.250	378.333	12.799	1.234
4 0.333	504.443	5.754	0.555
5 0.417	630.554	3.189	0.308
6 0.500	756.665	1.763	0.170
7 0.583	882.776	1.070	0.103
Sum = 100.000		Sum=	9.645

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)		Effective (In/Hr)
			Max	Low	
1 0.08	1.30	0.199	(0.266)	0.179	0.020
2 0.17	1.30	0.199	(0.266)	0.179	0.020
3 0.25	1.10	0.168	(0.266)	0.152	0.017
4 0.33	1.50	0.230	(0.266)	0.207	0.023
5 0.42	1.50	0.230	(0.266)	0.207	0.023
6 0.50	1.80	0.276	(0.266)	0.248	0.028
7 0.58	1.50	0.230	(0.266)	0.207	0.023
8 0.67	1.80	0.276	(0.266)	0.248	0.028
9 0.75	1.80	0.276	(0.266)	0.248	0.028
10 0.83	1.50	0.230	(0.266)	0.207	0.023
11 0.92	1.60	0.245	(0.266)	0.220	0.024
12 1.00	1.80	0.276	(0.266)	0.248	0.028
13 1.08	2.20	0.337	0.266	(0.303)	0.071
14 1.17	2.20	0.337	0.266	(0.303)	0.071
15 1.25	2.20	0.337	0.266	(0.303)	0.071
16 1.33	2.00	0.306	0.266	(0.276)	0.040
17 1.42	2.60	0.398	0.266	(0.358)	0.132
18 1.50	2.70	0.413	0.266	(0.372)	0.148
19 1.58	2.40	0.367	0.266	(0.331)	0.102
20 1.67	2.70	0.413	0.266	(0.372)	0.148
21 1.75	3.30	0.505	0.266	(0.455)	0.240
22 1.83	3.10	0.475	0.266	(0.427)	0.209
23 1.92	2.90	0.444	0.266	(0.400)	0.178
24 2.00	3.00	0.459	0.266	(0.413)	0.194
25 2.08	3.10	0.475	0.266	(0.427)	0.209
26 2.17	4.20	0.643	0.266	(0.579)	0.377
27 2.25	5.00	0.766	0.266	(0.689)	0.500
28 2.33	3.50	0.536	0.266	(0.482)	0.270
29 2.42	6.80	1.041	0.266	(0.937)	0.775

30	2.50	7.30	1.118	0.266	(1.006)	0.852
31	2.58	8.20	1.256	0.266	(1.130)	0.990
32	2.67	5.90	0.903	0.266	(0.813)	0.638
33	2.75	2.00	0.306	0.266	(0.276)	0.040
34	2.83	1.80	0.276	(0.266)	0.248	0.028
35	2.92	1.80	0.276	(0.266)	0.248	0.028
36	3.00	0.60	0.092	(0.266)	0.083	0.009

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.6

Flood volume = Effective rainfall 0.55(In)
times area 9.6(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)

Total soil loss = 0.73(In)

Total soil loss = 0.579(Ac.Ft)

Total rainfall = 1.28(In)

Flood volume = 19113.1 Cubic Feet

Total soil loss = 25215.3 Cubic Feet

Peak flow rate of this hydrograph = 7.979(CFS)

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3 - 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	0.0004	0.05	Q					
0+10	0.0014	0.14	Q					
0+15	0.0025	0.16	Q					
0+20	0.0037	0.17	Q					
0+25	0.0051	0.21	Q					
0+30	0.0066	0.23	Q					
0+35	0.0083	0.24	Q					
0+40	0.0099	0.24	Q					
0+45	0.0117	0.26	Q					
0+50	0.0134	0.25	Q					
0+55	0.0150	0.23	QV					
1+ 0	0.0167	0.25	QV					
1+ 5	0.0193	0.37	Q					
1+10	0.0233	0.58	Q					
1+15	0.0277	0.63	Q					
1+20	0.0316	0.58	Q					
1+25	0.0364	0.69	QV					
1+30	0.0442	1.13	Q					
1+35	0.0523	1.18	Q					
1+40	0.0602	1.15	QV					
1+45	0.0711	1.58	Q					
1+50	0.0847	1.97	Q					
1+55	0.0977	1.89	QV					
2+ 0	0.1101	1.81	Q	V				
2+ 5	0.1232	1.89	Q	V				
2+10	0.1398	2.42	Q	V				
2+15	0.1642	3.55		Q	V			
2+20	0.1899	3.73		Q	V			
2+25	0.2190	4.22		Q	V			
2+30	0.2647	6.63			V	Q		
2+35	0.3191	7.91				V	Q	
2+40	0.3741	7.98				Q	V	
2+45	0.4093	5.12			Q			V
2+50	0.4232	2.02	Q					V
2+55	0.4310	1.13	Q					V
3+ 0	0.4356	0.66	Q					V
3+ 5	0.4378	0.32	Q					V
3+10	0.4385	0.11	Q					V
3+15	0.4387	0.02	Q					V
3+20	0.4387	0.01	Q					V
3+25	0.4388	0.00	Q					V

3+30 0.4388 0.00 Q | | | v|

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930EX10610.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
EXISTING CONDITION
10-YEAR 6 HR

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.066 Hr.
Lag time = 3.96 Min.
25% of lag time = 0.99 Min.
40% of lag time = 1.59 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	1.20	11.48

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	2.50	23.93

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 2.500(In)

Point rain (area averaged) = 1.735(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.735(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

1.750	69.00	0.500
7.820	77.00	0.000
Total Area Entered =		9.57(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.500	0.205	0.183	0.037
77.0	77.0	0.279	0.000	0.279	0.817	0.228
Sum (F) =						0.266

Area averaged mean soil loss (F) (In/Hr) = 0.266

Minimum soil loss rate ((In/Hr)) = 0.133

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	126.111	2.599
2	0.167	252.222	4.676
3	0.250	378.333	1.234
4	0.333	504.443	0.555
5	0.417	630.554	0.308
6	0.500	756.665	0.170
7	0.583	882.776	0.103
Sum =		100.000	Sum= 9.645

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)		Effective (In/Hr)
			Max	Low	
1	0.08	0.50	(0.266)	0.094	0.010
2	0.17	0.60	(0.266)	0.112	0.012
3	0.25	0.60	(0.266)	0.112	0.012
4	0.33	0.60	(0.266)	0.112	0.012
5	0.42	0.60	(0.266)	0.112	0.012
6	0.50	0.70	(0.266)	0.131	0.015
7	0.58	0.70	(0.266)	0.131	0.015
8	0.67	0.70	(0.266)	0.131	0.015
9	0.75	0.70	(0.266)	0.131	0.015
10	0.83	0.70	(0.266)	0.131	0.015
11	0.92	0.70	(0.266)	0.131	0.015
12	1.00	0.80	(0.266)	0.150	0.017
13	1.08	0.80	(0.266)	0.150	0.017
14	1.17	0.80	(0.266)	0.150	0.017
15	1.25	0.80	(0.266)	0.150	0.017
16	1.33	0.80	(0.266)	0.150	0.017
17	1.42	0.80	(0.266)	0.150	0.017
18	1.50	0.80	(0.266)	0.150	0.017
19	1.58	0.80	(0.266)	0.150	0.017
20	1.67	0.80	(0.266)	0.150	0.017
21	1.75	0.80	(0.266)	0.150	0.017
22	1.83	0.80	(0.266)	0.150	0.017
23	1.92	0.80	(0.266)	0.150	0.017
24	2.00	0.90	(0.266)	0.169	0.019
25	2.08	0.80	(0.266)	0.150	0.017
26	2.17	0.90	(0.266)	0.169	0.019
27	2.25	0.90	(0.266)	0.169	0.019
28	2.33	0.90	(0.266)	0.169	0.019
29	2.42	0.90	(0.266)	0.169	0.019

30	2.50	0.90	0.187	(0.266)	0.169	0.019
31	2.58	0.90	0.187	(0.266)	0.169	0.019
32	2.67	0.90	0.187	(0.266)	0.169	0.019
33	2.75	1.00	0.208	(0.266)	0.187	0.021
34	2.83	1.00	0.208	(0.266)	0.187	0.021
35	2.92	1.00	0.208	(0.266)	0.187	0.021
36	3.00	1.00	0.208	(0.266)	0.187	0.021
37	3.08	1.00	0.208	(0.266)	0.187	0.021
38	3.17	1.10	0.229	(0.266)	0.206	0.023
39	3.25	1.10	0.229	(0.266)	0.206	0.023
40	3.33	1.10	0.229	(0.266)	0.206	0.023
41	3.42	1.20	0.250	(0.266)	0.225	0.025
42	3.50	1.30	0.271	(0.266)	0.244	0.027
43	3.58	1.40	0.291	(0.266)	0.262	0.029
44	3.67	1.40	0.291	(0.266)	0.262	0.029
45	3.75	1.50	0.312	0.266 (0.281)		0.046
46	3.83	1.50	0.312	0.266 (0.281)		0.046
47	3.92	1.60	0.333	0.266 (0.300)		0.067
48	4.00	1.60	0.333	0.266 (0.300)		0.067
49	4.08	1.70	0.354	0.266 (0.319)		0.088
50	4.17	1.80	0.375	0.266 (0.337)		0.109
51	4.25	1.90	0.396	0.266 (0.356)		0.130
52	4.33	2.00	0.416	0.266 (0.375)		0.151
53	4.42	2.10	0.437	0.266 (0.393)		0.171
54	4.50	2.10	0.437	0.266 (0.393)		0.171
55	4.58	2.20	0.458	0.266 (0.412)		0.192
56	4.67	2.30	0.479	0.266 (0.431)		0.213
57	4.75	2.40	0.500	0.266 (0.450)		0.234
58	4.83	2.40	0.500	0.266 (0.450)		0.234
59	4.92	2.50	0.520	0.266 (0.468)		0.255
60	5.00	2.60	0.541	0.266 (0.487)		0.275
61	5.08	3.10	0.645	0.266 (0.581)		0.380
62	5.17	3.60	0.749	0.266 (0.674)		0.484
63	5.25	3.90	0.812	0.266 (0.731)		0.546
64	5.33	4.20	0.874	0.266 (0.787)		0.609
65	5.42	4.70	0.978	0.266 (0.881)		0.713
66	5.50	5.60	1.166	0.266 (1.049)		0.900
67	5.58	1.90	0.396	0.266 (0.356)		0.130
68	5.67	0.90	0.187	(0.266)	0.169	0.019
69	5.75	0.60	0.125	(0.266)	0.112	0.012
70	5.83	0.50	0.104	(0.266)	0.094	0.010
71	5.92	0.30	0.062	(0.266)	0.056	0.006
72	6.00	0.20	0.042	(0.266)	0.037	0.004

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.1

Flood volume = Effective rainfall 0.59(In)
times area 9.6(Ac.)/[(In)/(Ft.)) = 0.5(Ac.Ft)

Total soil loss = 1.15(In)
Total soil loss = 0.914(Ac.Ft)

Total rainfall = 1.73(In)
Flood volume = 20437.4 Cubic Feet
Total soil loss = 39827.1 Cubic Feet

Peak flow rate of this hydrograph = 6.970(CFS)

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6 - 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	0.03	Q					
0+10	0.0007	0.08	Q					
0+15	0.0015	0.10	Q					
0+20	0.0022	0.11	Q					
0+25	0.0030	0.12	Q					

0+30	0.0039	0.12	Q						
0+35	0.0048	0.14	Q						
0+40	0.0058	0.14	Q						
0+45	0.0067	0.14	Q						
0+50	0.0077	0.14	Q						
0+55	0.0087	0.14	Q						
1+ 0	0.0097	0.15	Q						
1+ 5	0.0107	0.16	Q						
1+10	0.0118	0.16	QV						
1+15	0.0129	0.16	QV						
1+20	0.0140	0.16	QV						
1+25	0.0151	0.16	QV						
1+30	0.0162	0.16	QV						
1+35	0.0174	0.16	QV						
1+40	0.0185	0.16	QV						
1+45	0.0196	0.16	QV						
1+50	0.0207	0.16	QV						
1+55	0.0218	0.16	QV						
2+ 0	0.0229	0.17	QV						
2+ 5	0.0241	0.17	Q V						
2+10	0.0253	0.17	Q V						
2+15	0.0265	0.18	Q V						
2+20	0.0277	0.18	Q V						
2+25	0.0290	0.18	Q V						
2+30	0.0302	0.18	Q V						
2+35	0.0314	0.18	Q V						
2+40	0.0327	0.18	Q V						
2+45	0.0340	0.19	Q V						
2+50	0.0353	0.20	Q V						
2+55	0.0367	0.20	Q V						
3+ 0	0.0381	0.20	Q V						
3+ 5	0.0394	0.20	Q V						
3+10	0.0409	0.21	Q V						
3+15	0.0423	0.22	Q V						
3+20	0.0439	0.22	Q V						
3+25	0.0454	0.23	Q V						
3+30	0.0471	0.24	Q V						
3+35	0.0488	0.26	Q V						
3+40	0.0507	0.27	Q V						
3+45	0.0529	0.32	Q V						
3+50	0.0557	0.41	Q V						
3+55	0.0591	0.48	Q V						
4+ 0	0.0631	0.59	Q V						
4+ 5	0.0678	0.67	Q V						
4+10	0.0736	0.84	Q V						
4+15	0.0806	1.03	Q V						
4+20	0.0890	1.22	Q V						
4+25	0.0988	1.42	Q V						
4+30	0.1095	1.56	Q V						
4+35	0.1210	1.66	Q V						
4+40	0.1336	1.84	Q V						
4+45	0.1476	2.03	Q V						
4+50	0.1626	2.17	Q V						
4+55	0.1782	2.27	Q V						
5+ 0	0.1950	2.44	Q V						
5+ 5	0.2146	2.85	Q V						
5+10	0.2397	3.65	Q V						
5+15	0.2704	4.45	Q V						
5+20	0.3055	5.10	Q V						
5+25	0.3456	5.83	Q V						
5+30	0.3936	6.97	Q V						
5+35	0.4353	6.06	Q V						
5+40	0.4525	2.49	Q						
5+45	0.4605	1.16	Q						
5+50	0.4649	0.64	Q						
5+55	0.4674	0.36	Q						
6+ 0	0.4686	0.18	Q						
6+ 5	0.4690	0.05	Q						
6+10	0.4691	0.02	Q						

6+15	0.4691	0.01	Q				V
6+20	0.4692	0.00	Q				V
6+25	0.4692	0.00	Q				V
6+30	0.4692	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/18/23 File: 3930EX102410.out

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

Program License Serial Number 6400

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

English Units used in output format

BAY AND DAY INDUSTRIAL BUILDING
EXISTING CONDITION
10-YEAR 24 HR

Drainage Area = 9.57(Ac.) = 0.015 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 9.57(Ac.) = 0.015 Sq. Mi.
Length along longest watercourse = 991.00(Ft.)
Length along longest watercourse measured to centroid = 533.00(Ft.)
Length along longest watercourse = 0.188 Mi.
Length along longest watercourse measured to centroid = 0.101 Mi.
Difference in elevation = 19.40(Ft.)
Slope along watercourse = 103.3623 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.066 Hr.
Lag time = 3.96 Min.
25% of lag time = 0.99 Min.
40% of lag time = 1.59 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]
9.57	1.90	18.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
9.57	4.20	40.19

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.900(In)
Area Averaged 100-Year Rainfall = 4.200(In)

Point rain (area averaged) = 2.846(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.846(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

1.750	69.00	0.500
7.820	77.00	0.000
Total Area Entered =		9.57(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
69.0	69.0	0.373	0.500	0.205	0.183	0.037
77.0	77.0	0.279	0.000	0.279	0.817	0.228
Sum (F) =						0.266

Area averaged mean soil loss (F) (In/Hr) = 0.266

Minimum soil loss rate ((In/Hr)) = 0.133

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	126.111	2.599
2	0.167	252.222	4.676
3	0.250	378.333	1.234
4	0.333	504.443	0.555
5	0.417	630.554	0.308
6	0.500	756.665	0.170
7	0.583	882.776	0.103
Sum = 100.000			Sum= 9.645

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)		Effective (In/Hr)
			Max	Low	
1	0.08	0.07	(0.471)	0.020	0.002
2	0.17	0.07	(0.469)	0.020	0.002
3	0.25	0.07	(0.468)	0.020	0.002
4	0.33	0.10	(0.466)	0.031	0.003
5	0.42	0.10	(0.464)	0.031	0.003
6	0.50	0.10	(0.462)	0.031	0.003
7	0.58	0.10	(0.460)	0.031	0.003
8	0.67	0.10	(0.459)	0.031	0.003
9	0.75	0.10	(0.457)	0.031	0.003
10	0.83	0.13	(0.455)	0.041	0.005
11	0.92	0.13	(0.453)	0.041	0.005
12	1.00	0.13	(0.451)	0.041	0.005
13	1.08	0.10	(0.450)	0.031	0.003
14	1.17	0.10	(0.448)	0.031	0.003
15	1.25	0.10	(0.446)	0.031	0.003
16	1.33	0.10	(0.444)	0.031	0.003
17	1.42	0.10	(0.442)	0.031	0.003
18	1.50	0.10	(0.441)	0.031	0.003
19	1.58	0.10	(0.439)	0.031	0.003
20	1.67	0.10	(0.437)	0.031	0.003
21	1.75	0.10	(0.435)	0.031	0.003
22	1.83	0.13	(0.434)	0.041	0.005
23	1.92	0.13	(0.432)	0.041	0.005
24	2.00	0.13	(0.430)	0.041	0.005
25	2.08	0.13	(0.428)	0.041	0.005
26	2.17	0.13	(0.427)	0.041	0.005
27	2.25	0.13	(0.425)	0.041	0.005
28	2.33	0.13	(0.423)	0.041	0.005
29	2.42	0.13	(0.422)	0.041	0.005

30	2.50	0.13	0.046	(0.420)	0.041	0.005
31	2.58	0.17	0.057	(0.418)	0.051	0.006
32	2.67	0.17	0.057	(0.416)	0.051	0.006
33	2.75	0.17	0.057	(0.415)	0.051	0.006
34	2.83	0.17	0.057	(0.413)	0.051	0.006
35	2.92	0.17	0.057	(0.411)	0.051	0.006
36	3.00	0.17	0.057	(0.410)	0.051	0.006
37	3.08	0.17	0.057	(0.408)	0.051	0.006
38	3.17	0.17	0.057	(0.406)	0.051	0.006
39	3.25	0.17	0.057	(0.404)	0.051	0.006
40	3.33	0.17	0.057	(0.403)	0.051	0.006
41	3.42	0.17	0.057	(0.401)	0.051	0.006
42	3.50	0.17	0.057	(0.399)	0.051	0.006
43	3.58	0.17	0.057	(0.398)	0.051	0.006
44	3.67	0.17	0.057	(0.396)	0.051	0.006
45	3.75	0.17	0.057	(0.394)	0.051	0.006
46	3.83	0.20	0.068	(0.393)	0.061	0.007
47	3.92	0.20	0.068	(0.391)	0.061	0.007
48	4.00	0.20	0.068	(0.389)	0.061	0.007
49	4.08	0.20	0.068	(0.388)	0.061	0.007
50	4.17	0.20	0.068	(0.386)	0.061	0.007
51	4.25	0.20	0.068	(0.384)	0.061	0.007
52	4.33	0.23	0.080	(0.383)	0.072	0.008
53	4.42	0.23	0.080	(0.381)	0.072	0.008
54	4.50	0.23	0.080	(0.380)	0.072	0.008
55	4.58	0.23	0.080	(0.378)	0.072	0.008
56	4.67	0.23	0.080	(0.376)	0.072	0.008
57	4.75	0.23	0.080	(0.375)	0.072	0.008
58	4.83	0.27	0.091	(0.373)	0.082	0.009
59	4.92	0.27	0.091	(0.371)	0.082	0.009
60	5.00	0.27	0.091	(0.370)	0.082	0.009
61	5.08	0.20	0.068	(0.368)	0.061	0.007
62	5.17	0.20	0.068	(0.367)	0.061	0.007
63	5.25	0.20	0.068	(0.365)	0.061	0.007
64	5.33	0.23	0.080	(0.363)	0.072	0.008
65	5.42	0.23	0.080	(0.362)	0.072	0.008
66	5.50	0.23	0.080	(0.360)	0.072	0.008
67	5.58	0.27	0.091	(0.359)	0.082	0.009
68	5.67	0.27	0.091	(0.357)	0.082	0.009
69	5.75	0.27	0.091	(0.356)	0.082	0.009
70	5.83	0.27	0.091	(0.354)	0.082	0.009
71	5.92	0.27	0.091	(0.352)	0.082	0.009
72	6.00	0.27	0.091	(0.351)	0.082	0.009
73	6.08	0.30	0.102	(0.349)	0.092	0.010
74	6.17	0.30	0.102	(0.348)	0.092	0.010
75	6.25	0.30	0.102	(0.346)	0.092	0.010
76	6.33	0.30	0.102	(0.345)	0.092	0.010
77	6.42	0.30	0.102	(0.343)	0.092	0.010
78	6.50	0.30	0.102	(0.342)	0.092	0.010
79	6.58	0.33	0.114	(0.340)	0.102	0.011
80	6.67	0.33	0.114	(0.338)	0.102	0.011
81	6.75	0.33	0.114	(0.337)	0.102	0.011
82	6.83	0.33	0.114	(0.335)	0.102	0.011
83	6.92	0.33	0.114	(0.334)	0.102	0.011
84	7.00	0.33	0.114	(0.332)	0.102	0.011
85	7.08	0.33	0.114	(0.331)	0.102	0.011
86	7.17	0.33	0.114	(0.329)	0.102	0.011
87	7.25	0.33	0.114	(0.328)	0.102	0.011
88	7.33	0.37	0.125	(0.326)	0.113	0.013
89	7.42	0.37	0.125	(0.325)	0.113	0.013
90	7.50	0.37	0.125	(0.323)	0.113	0.013
91	7.58	0.40	0.137	(0.322)	0.123	0.014
92	7.67	0.40	0.137	(0.320)	0.123	0.014
93	7.75	0.40	0.137	(0.319)	0.123	0.014
94	7.83	0.43	0.148	(0.318)	0.133	0.015
95	7.92	0.43	0.148	(0.316)	0.133	0.015
96	8.00	0.43	0.148	(0.315)	0.133	0.015
97	8.08	0.50	0.171	(0.313)	0.154	0.017
98	8.17	0.50	0.171	(0.312)	0.154	0.017

99	8.25	0.50	0.171	(0.310)	0.154	0.017
100	8.33	0.50	0.171	(0.309)	0.154	0.017
101	8.42	0.50	0.171	(0.307)	0.154	0.017
102	8.50	0.50	0.171	(0.306)	0.154	0.017
103	8.58	0.53	0.182	(0.304)	0.164	0.018
104	8.67	0.53	0.182	(0.303)	0.164	0.018
105	8.75	0.53	0.182	(0.302)	0.164	0.018
106	8.83	0.57	0.194	(0.300)	0.174	0.019
107	8.92	0.57	0.194	(0.299)	0.174	0.019
108	9.00	0.57	0.194	(0.297)	0.174	0.019
109	9.08	0.63	0.216	(0.296)	0.195	0.022
110	9.17	0.63	0.216	(0.295)	0.195	0.022
111	9.25	0.63	0.216	(0.293)	0.195	0.022
112	9.33	0.67	0.228	(0.292)	0.205	0.023
113	9.42	0.67	0.228	(0.290)	0.205	0.023
114	9.50	0.67	0.228	(0.289)	0.205	0.023
115	9.58	0.70	0.239	(0.288)	0.215	0.024
116	9.67	0.70	0.239	(0.286)	0.215	0.024
117	9.75	0.70	0.239	(0.285)	0.215	0.024
118	9.83	0.73	0.250	(0.283)	0.225	0.025
119	9.92	0.73	0.250	(0.282)	0.225	0.025
120	10.00	0.73	0.250	(0.281)	0.225	0.025
121	10.08	0.50	0.171	(0.279)	0.154	0.017
122	10.17	0.50	0.171	(0.278)	0.154	0.017
123	10.25	0.50	0.171	(0.277)	0.154	0.017
124	10.33	0.50	0.171	(0.275)	0.154	0.017
125	10.42	0.50	0.171	(0.274)	0.154	0.017
126	10.50	0.50	0.171	(0.273)	0.154	0.017
127	10.58	0.67	0.228	(0.271)	0.205	0.023
128	10.67	0.67	0.228	(0.270)	0.205	0.023
129	10.75	0.67	0.228	(0.269)	0.205	0.023
130	10.83	0.67	0.228	(0.267)	0.205	0.023
131	10.92	0.67	0.228	(0.266)	0.205	0.023
132	11.00	0.67	0.228	(0.265)	0.205	0.023
133	11.08	0.63	0.216	(0.263)	0.195	0.022
134	11.17	0.63	0.216	(0.262)	0.195	0.022
135	11.25	0.63	0.216	(0.261)	0.195	0.022
136	11.33	0.63	0.216	(0.260)	0.195	0.022
137	11.42	0.63	0.216	(0.258)	0.195	0.022
138	11.50	0.63	0.216	(0.257)	0.195	0.022
139	11.58	0.57	0.194	(0.256)	0.174	0.019
140	11.67	0.57	0.194	(0.254)	0.174	0.019
141	11.75	0.57	0.194	(0.253)	0.174	0.019
142	11.83	0.60	0.205	(0.252)	0.184	0.020
143	11.92	0.60	0.205	(0.251)	0.184	0.020
144	12.00	0.60	0.205	(0.249)	0.184	0.020
145	12.08	0.83	0.285	0.248 (0.256)		0.036
146	12.17	0.83	0.285	0.247 (0.256)		0.038
147	12.25	0.83	0.285	0.246 (0.256)		0.039
148	12.33	0.87	0.296	0.244 (0.266)		0.052
149	12.42	0.87	0.296	0.243 (0.266)		0.053
150	12.50	0.87	0.296	0.242 (0.266)		0.054
151	12.58	0.93	0.319	0.241 (0.287)		0.078
152	12.67	0.93	0.319	0.240 (0.287)		0.079
153	12.75	0.93	0.319	0.238 (0.287)		0.080
154	12.83	0.97	0.330	0.237 (0.297)		0.093
155	12.92	0.97	0.330	0.236 (0.297)		0.094
156	13.00	0.97	0.330	0.235 (0.297)		0.095
157	13.08	1.13	0.387	0.234 (0.348)		0.154
158	13.17	1.13	0.387	0.232 (0.348)		0.155
159	13.25	1.13	0.387	0.231 (0.348)		0.156
160	13.33	1.13	0.387	0.230 (0.348)		0.157
161	13.42	1.13	0.387	0.229 (0.348)		0.158
162	13.50	1.13	0.387	0.228 (0.348)		0.159
163	13.58	0.77	0.262	0.227 (0.236)		0.035
164	13.67	0.77	0.262	0.225 (0.236)		0.036
165	13.75	0.77	0.262	0.224 (0.236)		0.038
166	13.83	0.77	0.262	0.223 (0.236)		0.039
167	13.92	0.77	0.262	0.222 (0.236)		0.040

168	14.00	0.77	0.262	0.221	(0.236)	0.041
169	14.08	0.90	0.307	0.220	(0.277)	0.088
170	14.17	0.90	0.307	0.219	(0.277)	0.089
171	14.25	0.90	0.307	0.217	(0.277)	0.090
172	14.33	0.87	0.296	0.216	(0.266)	0.080
173	14.42	0.87	0.296	0.215	(0.266)	0.081
174	14.50	0.87	0.296	0.214	(0.266)	0.082
175	14.58	0.87	0.296	0.213	(0.266)	0.083
176	14.67	0.87	0.296	0.212	(0.266)	0.084
177	14.75	0.87	0.296	0.211	(0.266)	0.085
178	14.83	0.83	0.285	0.210	(0.256)	0.075
179	14.92	0.83	0.285	0.209	(0.256)	0.076
180	15.00	0.83	0.285	0.208	(0.256)	0.077
181	15.08	0.80	0.273	0.207	(0.246)	0.067
182	15.17	0.80	0.273	0.205	(0.246)	0.068
183	15.25	0.80	0.273	0.204	(0.246)	0.069
184	15.33	0.77	0.262	0.203	(0.236)	0.058
185	15.42	0.77	0.262	0.202	(0.236)	0.060
186	15.50	0.77	0.262	0.201	(0.236)	0.061
187	15.58	0.63	0.216	(0.200)	0.195	0.022
188	15.67	0.63	0.216	(0.199)	0.195	0.022
189	15.75	0.63	0.216	(0.198)	0.195	0.022
190	15.83	0.63	0.216	(0.197)	0.195	0.022
191	15.92	0.63	0.216	(0.196)	0.195	0.022
192	16.00	0.63	0.216	(0.195)	0.195	0.022
193	16.08	0.13	0.046	(0.194)	0.041	0.005
194	16.17	0.13	0.046	(0.193)	0.041	0.005
195	16.25	0.13	0.046	(0.192)	0.041	0.005
196	16.33	0.13	0.046	(0.191)	0.041	0.005
197	16.42	0.13	0.046	(0.190)	0.041	0.005
198	16.50	0.13	0.046	(0.189)	0.041	0.005
199	16.58	0.10	0.034	(0.188)	0.031	0.003
200	16.67	0.10	0.034	(0.187)	0.031	0.003
201	16.75	0.10	0.034	(0.186)	0.031	0.003
202	16.83	0.10	0.034	(0.185)	0.031	0.003
203	16.92	0.10	0.034	(0.185)	0.031	0.003
204	17.00	0.10	0.034	(0.184)	0.031	0.003
205	17.08	0.17	0.057	(0.183)	0.051	0.006
206	17.17	0.17	0.057	(0.182)	0.051	0.006
207	17.25	0.17	0.057	(0.181)	0.051	0.006
208	17.33	0.17	0.057	(0.180)	0.051	0.006
209	17.42	0.17	0.057	(0.179)	0.051	0.006
210	17.50	0.17	0.057	(0.178)	0.051	0.006
211	17.58	0.17	0.057	(0.177)	0.051	0.006
212	17.67	0.17	0.057	(0.176)	0.051	0.006
213	17.75	0.17	0.057	(0.175)	0.051	0.006
214	17.83	0.13	0.046	(0.175)	0.041	0.005
215	17.92	0.13	0.046	(0.174)	0.041	0.005
216	18.00	0.13	0.046	(0.173)	0.041	0.005
217	18.08	0.13	0.046	(0.172)	0.041	0.005
218	18.17	0.13	0.046	(0.171)	0.041	0.005
219	18.25	0.13	0.046	(0.170)	0.041	0.005
220	18.33	0.13	0.046	(0.170)	0.041	0.005
221	18.42	0.13	0.046	(0.169)	0.041	0.005
222	18.50	0.13	0.046	(0.168)	0.041	0.005
223	18.58	0.10	0.034	(0.167)	0.031	0.003
224	18.67	0.10	0.034	(0.166)	0.031	0.003
225	18.75	0.10	0.034	(0.165)	0.031	0.003
226	18.83	0.07	0.023	(0.165)	0.020	0.002
227	18.92	0.07	0.023	(0.164)	0.020	0.002
228	19.00	0.07	0.023	(0.163)	0.020	0.002
229	19.08	0.10	0.034	(0.162)	0.031	0.003
230	19.17	0.10	0.034	(0.162)	0.031	0.003
231	19.25	0.10	0.034	(0.161)	0.031	0.003
232	19.33	0.13	0.046	(0.160)	0.041	0.005
233	19.42	0.13	0.046	(0.159)	0.041	0.005
234	19.50	0.13	0.046	(0.159)	0.041	0.005
235	19.58	0.10	0.034	(0.158)	0.031	0.003
236	19.67	0.10	0.034	(0.157)	0.031	0.003

237	19.75	0.10	0.034	(0.156)	0.031	0.003
238	19.83	0.07	0.023	(0.156)	0.020	0.002
239	19.92	0.07	0.023	(0.155)	0.020	0.002
240	20.00	0.07	0.023	(0.154)	0.020	0.002
241	20.08	0.10	0.034	(0.154)	0.031	0.003
242	20.17	0.10	0.034	(0.153)	0.031	0.003
243	20.25	0.10	0.034	(0.152)	0.031	0.003
244	20.33	0.10	0.034	(0.152)	0.031	0.003
245	20.42	0.10	0.034	(0.151)	0.031	0.003
246	20.50	0.10	0.034	(0.150)	0.031	0.003
247	20.58	0.10	0.034	(0.150)	0.031	0.003
248	20.67	0.10	0.034	(0.149)	0.031	0.003
249	20.75	0.10	0.034	(0.149)	0.031	0.003
250	20.83	0.07	0.023	(0.148)	0.020	0.002
251	20.92	0.07	0.023	(0.147)	0.020	0.002
252	21.00	0.07	0.023	(0.147)	0.020	0.002
253	21.08	0.10	0.034	(0.146)	0.031	0.003
254	21.17	0.10	0.034	(0.146)	0.031	0.003
255	21.25	0.10	0.034	(0.145)	0.031	0.003
256	21.33	0.07	0.023	(0.144)	0.020	0.002
257	21.42	0.07	0.023	(0.144)	0.020	0.002
258	21.50	0.07	0.023	(0.143)	0.020	0.002
259	21.58	0.10	0.034	(0.143)	0.031	0.003
260	21.67	0.10	0.034	(0.142)	0.031	0.003
261	21.75	0.10	0.034	(0.142)	0.031	0.003
262	21.83	0.07	0.023	(0.141)	0.020	0.002
263	21.92	0.07	0.023	(0.141)	0.020	0.002
264	22.00	0.07	0.023	(0.140)	0.020	0.002
265	22.08	0.10	0.034	(0.140)	0.031	0.003
266	22.17	0.10	0.034	(0.139)	0.031	0.003
267	22.25	0.10	0.034	(0.139)	0.031	0.003
268	22.33	0.07	0.023	(0.139)	0.020	0.002
269	22.42	0.07	0.023	(0.138)	0.020	0.002
270	22.50	0.07	0.023	(0.138)	0.020	0.002
271	22.58	0.07	0.023	(0.137)	0.020	0.002
272	22.67	0.07	0.023	(0.137)	0.020	0.002
273	22.75	0.07	0.023	(0.137)	0.020	0.002
274	22.83	0.07	0.023	(0.136)	0.020	0.002
275	22.92	0.07	0.023	(0.136)	0.020	0.002
276	23.00	0.07	0.023	(0.136)	0.020	0.002
277	23.08	0.07	0.023	(0.135)	0.020	0.002
278	23.17	0.07	0.023	(0.135)	0.020	0.002
279	23.25	0.07	0.023	(0.135)	0.020	0.002
280	23.33	0.07	0.023	(0.134)	0.020	0.002
281	23.42	0.07	0.023	(0.134)	0.020	0.002
282	23.50	0.07	0.023	(0.134)	0.020	0.002
283	23.58	0.07	0.023	(0.134)	0.020	0.002
284	23.67	0.07	0.023	(0.133)	0.020	0.002
285	23.75	0.07	0.023	(0.133)	0.020	0.002
286	23.83	0.07	0.023	(0.133)	0.020	0.002
287	23.92	0.07	0.023	(0.133)	0.020	0.002
288	24.00	0.07	0.023	(0.133)	0.020	0.002

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.5

Flood volume = Effective rainfall 0.46(In)
times area 9.6(Ac.)/[(In)/(Ft.)) = 0.4(Ac.Ft)
Total soil loss = 2.39(In)
Total soil loss = 1.906(Ac.Ft)
Total rainfall = 2.85(In)
Flood volume = 15842.9 Cubic Feet
Total soil loss = 83031.0 Cubic Feet

Peak flow rate of this hydrograph = 1.519(CFS)

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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	0.01	Q					
0+10	0.0002	0.02	Q					
0+15	0.0003	0.02	Q					
0+20	0.0005	0.02	Q					
0+25	0.0007	0.03	Q					
0+30	0.0009	0.03	Q					
0+35	0.0011	0.03	Q					
0+40	0.0013	0.03	Q					
0+45	0.0015	0.03	Q					
0+50	0.0018	0.04	Q					
0+55	0.0021	0.04	Q					
1+ 0	0.0024	0.04	Q					
1+ 5	0.0026	0.04	Q					
1+10	0.0029	0.04	Q					
1+15	0.0031	0.03	Q					
1+20	0.0034	0.03	Q					
1+25	0.0036	0.03	Q					
1+30	0.0038	0.03	Q					
1+35	0.0040	0.03	Q					
1+40	0.0043	0.03	Q					
1+45	0.0045	0.03	Q					
1+50	0.0047	0.04	Q					
1+55	0.0050	0.04	Q					
2+ 0	0.0053	0.04	Q					
2+ 5	0.0056	0.04	Q					
2+10	0.0059	0.04	Q					
2+15	0.0062	0.04	Q					
2+20	0.0065	0.04	Q					
2+25	0.0068	0.04	Q					
2+30	0.0071	0.04	Q					
2+35	0.0075	0.05	Q					
2+40	0.0078	0.05	Q					
2+45	0.0082	0.05	Q					
2+50	0.0086	0.05	Q					
2+55	0.0089	0.05	Q					
3+ 0	0.0093	0.05	QV					
3+ 5	0.0097	0.05	QV					
3+10	0.0101	0.05	QV					
3+15	0.0104	0.05	QV					
3+20	0.0108	0.05	QV					
3+25	0.0112	0.05	QV					
3+30	0.0116	0.05	QV					
3+35	0.0120	0.05	QV					
3+40	0.0123	0.05	QV					
3+45	0.0127	0.05	QV					
3+50	0.0131	0.06	QV					
3+55	0.0135	0.06	QV					
4+ 0	0.0140	0.06	QV					
4+ 5	0.0144	0.07	QV					
4+10	0.0149	0.07	QV					
4+15	0.0153	0.07	QV					
4+20	0.0158	0.07	QV					
4+25	0.0163	0.07	QV					
4+30	0.0169	0.08	QV					
4+35	0.0174	0.08	QV					
4+40	0.0179	0.08	QV					
4+45	0.0184	0.08	Q V					
4+50	0.0190	0.08	Q V					
4+55	0.0196	0.09	Q V					
5+ 0	0.0202	0.09	Q V					
5+ 5	0.0207	0.08	Q V					
5+10	0.0212	0.07	Q V					
5+15	0.0217	0.07	Q V					
5+20	0.0222	0.07	Q V					
5+25	0.0227	0.07	Q V					

5+30	0.0232	0.08	Q	V				
5+35	0.0238	0.08	Q	V				
5+40	0.0243	0.08	Q	V				
5+45	0.0249	0.09	Q	V				
5+50	0.0255	0.09	Q	V				
5+55	0.0261	0.09	Q	V				
6+ 0	0.0267	0.09	Q	V				
6+ 5	0.0274	0.09	Q	V				
6+10	0.0280	0.10	Q	V				
6+15	0.0287	0.10	Q	V				
6+20	0.0294	0.10	Q	V				
6+25	0.0301	0.10	Q	V				
6+30	0.0307	0.10	Q	V				
6+35	0.0314	0.10	Q	V				
6+40	0.0322	0.11	Q	V				
6+45	0.0329	0.11	Q	V				
6+50	0.0337	0.11	Q	V				
6+55	0.0344	0.11	Q	V				
7+ 0	0.0352	0.11	Q	V				
7+ 5	0.0359	0.11	Q	V				
7+10	0.0367	0.11	Q	V				
7+15	0.0375	0.11	Q	V				
7+20	0.0382	0.11	Q	V				
7+25	0.0390	0.12	Q	V				
7+30	0.0399	0.12	Q	V				
7+35	0.0407	0.12	Q	V				
7+40	0.0416	0.13	Q	V				
7+45	0.0425	0.13	Q	V				
7+50	0.0434	0.13	Q	V				
7+55	0.0444	0.14	Q	V				
8+ 0	0.0454	0.14	Q	V				
8+ 5	0.0464	0.15	Q	V				
8+10	0.0475	0.16	Q	V				
8+15	0.0486	0.16	Q	V				
8+20	0.0497	0.16	Q	V				
8+25	0.0509	0.16	Q	V				
8+30	0.0520	0.16	Q	V				
8+35	0.0531	0.17	Q	V				
8+40	0.0543	0.17	Q	V				
8+45	0.0555	0.17	Q	V				
8+50	0.0568	0.18	Q	V				
8+55	0.0580	0.18	Q	V				
9+ 0	0.0593	0.19	Q	V				
9+ 5	0.0606	0.19	Q	V				
9+10	0.0620	0.20	Q	V				
9+15	0.0634	0.21	Q	V				
9+20	0.0649	0.21	Q	V				
9+25	0.0664	0.22	Q	V				
9+30	0.0679	0.22	Q	V				
9+35	0.0694	0.22	Q	V				
9+40	0.0710	0.23	Q	V				
9+45	0.0726	0.23	Q	V				
9+50	0.0742	0.23	Q	V				
9+55	0.0758	0.24	Q	V				
10+ 0	0.0775	0.24	Q	V				
10+ 5	0.0790	0.22	Q	V				
10+10	0.0802	0.18	Q	V				
10+15	0.0814	0.17	Q	V				
10+20	0.0826	0.17	Q	V				
10+25	0.0838	0.17	Q	V				
10+30	0.0849	0.17	Q	V				
10+35	0.0861	0.18	Q	V				
10+40	0.0876	0.21	Q	V				
10+45	0.0890	0.21	Q	V				
10+50	0.0905	0.22	Q	V				
10+55	0.0920	0.22	Q	V				
11+ 0	0.0935	0.22	Q	V				
11+ 5	0.0950	0.22	Q	V				
11+10	0.0965	0.21	Q	V				

11+15	0.0979	0.21	Q	V				
11+20	0.0994	0.21	Q	V				
11+25	0.1008	0.21	Q	V				
11+30	0.1022	0.21	Q	V				
11+35	0.1036	0.20	Q	V				
11+40	0.1050	0.19	Q	V				
11+45	0.1063	0.19	Q	V				
11+50	0.1076	0.19	Q	V				
11+55	0.1089	0.20	Q	V				
12+ 0	0.1103	0.20	Q	V				
12+ 5	0.1119	0.24	Q	V				
12+10	0.1141	0.32	Q	V				
12+15	0.1165	0.35	Q	V				
12+20	0.1192	0.40	Q	V				
12+25	0.1224	0.46	Q	V				
12+30	0.1258	0.49	Q	V				
12+35	0.1298	0.57	Q	V				
12+40	0.1345	0.69	Q	V				
12+45	0.1396	0.74	Q	V				
12+50	0.1450	0.79	Q	V				
12+55	0.1510	0.86	Q	V				
13+ 0	0.1571	0.89	Q	V				
13+ 5	0.1644	1.06	Q	V				
13+10	0.1737	1.34	Q	V				
13+15	0.1835	1.43	Q	V				
13+20	0.1936	1.47	Q	V				
13+25	0.2039	1.50	Q	V				
13+30	0.2144	1.52	Q	V				
13+35	0.2227	1.21	Q	V				
13+40	0.2271	0.64	Q	V				
13+45	0.2305	0.49	Q	V				
13+50	0.2335	0.43	Q	V				
13+55	0.2363	0.41	Q	V				
14+ 0	0.2390	0.40	Q	V				
14+ 5	0.2425	0.51	Q	V				
14+10	0.2476	0.74	Q	V				
14+15	0.2531	0.80	Q	V				
14+20	0.2587	0.81	Q	V				
14+25	0.2641	0.78	Q	V				
14+30	0.2695	0.79	Q	V				
14+35	0.2750	0.79	Q	V				
14+40	0.2805	0.80	Q	V				
14+45	0.2861	0.81	Q	V				
14+50	0.2915	0.79	Q	V				
14+55	0.2967	0.75	Q	V				
15+ 0	0.3018	0.74	Q	V				
15+ 5	0.3067	0.72	Q	V				
15+10	0.3114	0.67	Q	V				
15+15	0.3159	0.67	Q	V				
15+20	0.3203	0.64	Q	V				
15+25	0.3244	0.59	Q	V				
15+30	0.3285	0.59	Q	V				
15+35	0.3318	0.49	Q	V				
15+40	0.3339	0.30	Q	V				
15+45	0.3356	0.25	Q	V				
15+50	0.3372	0.23	Q	V				
15+55	0.3387	0.22	Q	V				
16+ 0	0.3402	0.21	Q	V				
16+ 5	0.3413	0.16	Q	V				
16+10	0.3419	0.08	Q	V				
16+15	0.3423	0.06	Q	V				
16+20	0.3427	0.05	Q	V				
16+25	0.3431	0.05	Q	V				
16+30	0.3434	0.05	Q	V				
16+35	0.3436	0.04	Q	V				
16+40	0.3439	0.04	Q	V				
16+45	0.3441	0.03	Q	V				
16+50	0.3444	0.03	Q	V				
16+55	0.3446	0.03	Q	V				

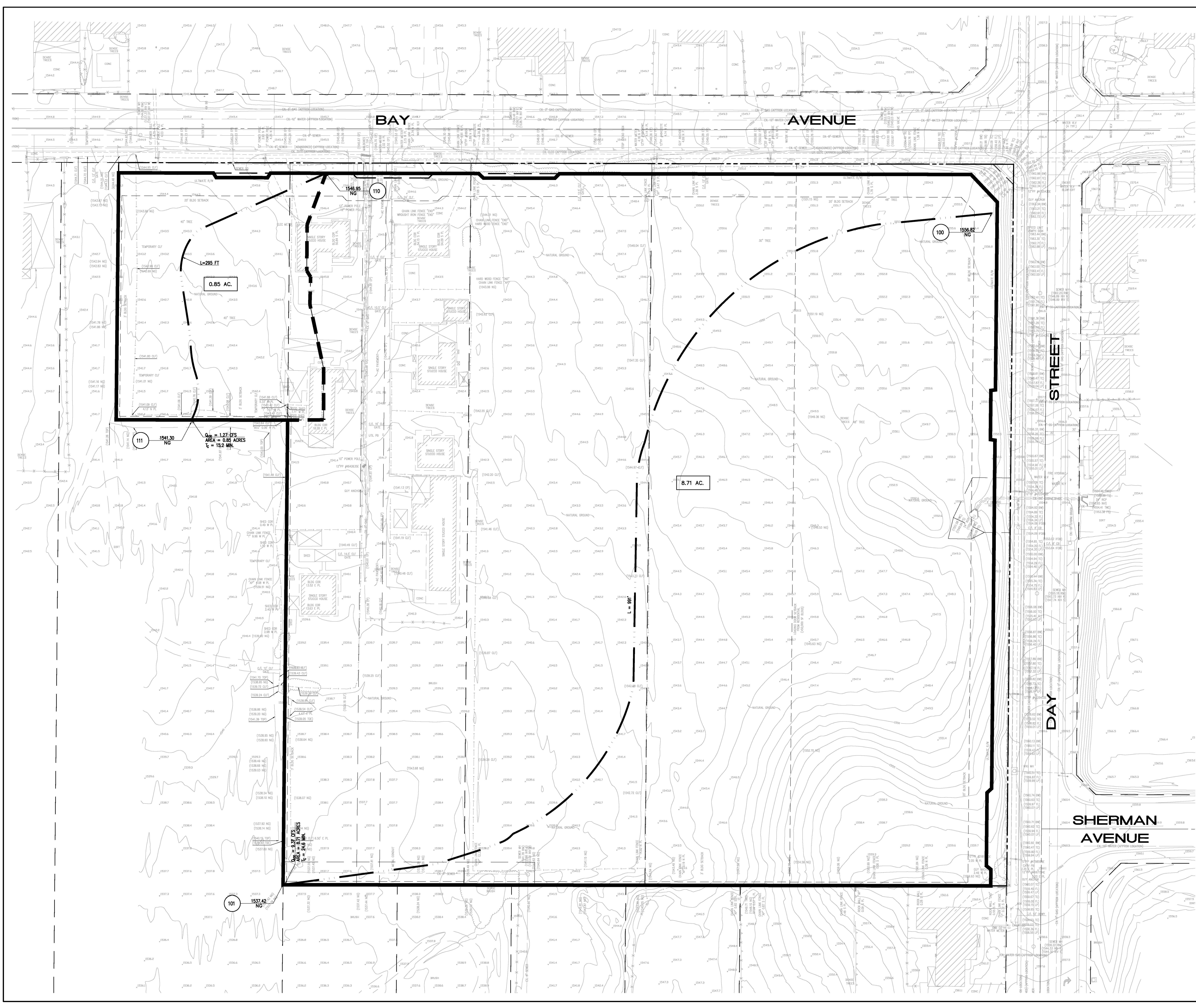
17+ 0	0.3448	0.03	Q				V
17+ 5	0.3451	0.04	Q				V
17+10	0.3454	0.05	Q				V
17+15	0.3458	0.05	Q				V
17+20	0.3462	0.05	Q				V
17+25	0.3465	0.05	Q				V
17+30	0.3469	0.05	Q				V
17+35	0.3473	0.05	Q				V
17+40	0.3477	0.05	Q				V
17+45	0.3480	0.05	Q				V
17+50	0.3484	0.05	Q				V
17+55	0.3487	0.05	Q				V
18+ 0	0.3490	0.05	Q				V
18+ 5	0.3493	0.04	Q				V
18+10	0.3496	0.04	Q				V
18+15	0.3499	0.04	Q				V
18+20	0.3503	0.04	Q				V
18+25	0.3506	0.04	Q				V
18+30	0.3509	0.04	Q				V
18+35	0.3511	0.04	Q				V
18+40	0.3514	0.04	Q				V
18+45	0.3516	0.03	Q				V
18+50	0.3518	0.03	Q				V
18+55	0.3520	0.02	Q				V
19+ 0	0.3522	0.02	Q				V
19+ 5	0.3523	0.03	Q				V
19+10	0.3526	0.03	Q				V
19+15	0.3528	0.03	Q				V
19+20	0.3530	0.04	Q				V
19+25	0.3533	0.04	Q				V
19+30	0.3536	0.04	Q				V
19+35	0.3539	0.04	Q				V
19+40	0.3541	0.04	Q				V
19+45	0.3543	0.03	Q				V
19+50	0.3546	0.03	Q				V
19+55	0.3547	0.02	Q				V
20+ 0	0.3549	0.02	Q				V
20+ 5	0.3551	0.03	Q				V
20+10	0.3553	0.03	Q				V
20+15	0.3555	0.03	Q				V
20+20	0.3557	0.03	Q				V
20+25	0.3559	0.03	Q				V
20+30	0.3562	0.03	Q				V
20+35	0.3564	0.03	Q				V
20+40	0.3566	0.03	Q				V
20+45	0.3568	0.03	Q				V
20+50	0.3571	0.03	Q				V
20+55	0.3572	0.02	Q				V
21+ 0	0.3574	0.02	Q				V
21+ 5	0.3576	0.03	Q				V
21+10	0.3578	0.03	Q				V
21+15	0.3580	0.03	Q				V
21+20	0.3582	0.03	Q				V
21+25	0.3584	0.02	Q				V
21+30	0.3585	0.02	Q				V
21+35	0.3587	0.03	Q				V
21+40	0.3589	0.03	Q				V
21+45	0.3591	0.03	Q				V
21+50	0.3593	0.03	Q				V
21+55	0.3595	0.02	Q				V
22+ 0	0.3597	0.02	Q				V
22+ 5	0.3598	0.03	Q				V
22+10	0.3600	0.03	Q				V
22+15	0.3603	0.03	Q				V
22+20	0.3605	0.03	Q				V
22+25	0.3606	0.02	Q				V
22+30	0.3608	0.02	Q				V
22+35	0.3609	0.02	Q				V
22+40	0.3611	0.02	Q				V

22+45	0.3613	0.02	Q				V
22+50	0.3614	0.02	Q				V
22+55	0.3616	0.02	Q				V
23+ 0	0.3617	0.02	Q				V
23+ 5	0.3619	0.02	Q				V
23+10	0.3620	0.02	Q				V
23+15	0.3622	0.02	Q				V
23+20	0.3623	0.02	Q				V
23+25	0.3625	0.02	Q				V
23+30	0.3626	0.02	Q				V
23+35	0.3628	0.02	Q				V
23+40	0.3629	0.02	Q				V
23+45	0.3631	0.02	Q				V
23+50	0.3632	0.02	Q				V
23+55	0.3634	0.02	Q				V
24+ 0	0.3635	0.02	Q				V
24+ 5	0.3636	0.02	Q				V
24+10	0.3637	0.01	Q				V
24+15	0.3637	0.00	Q				V
24+20	0.3637	0.00	Q				V
24+25	0.3637	0.00	Q				V
24+30	0.3637	0.00	Q				V

APPENDIX D

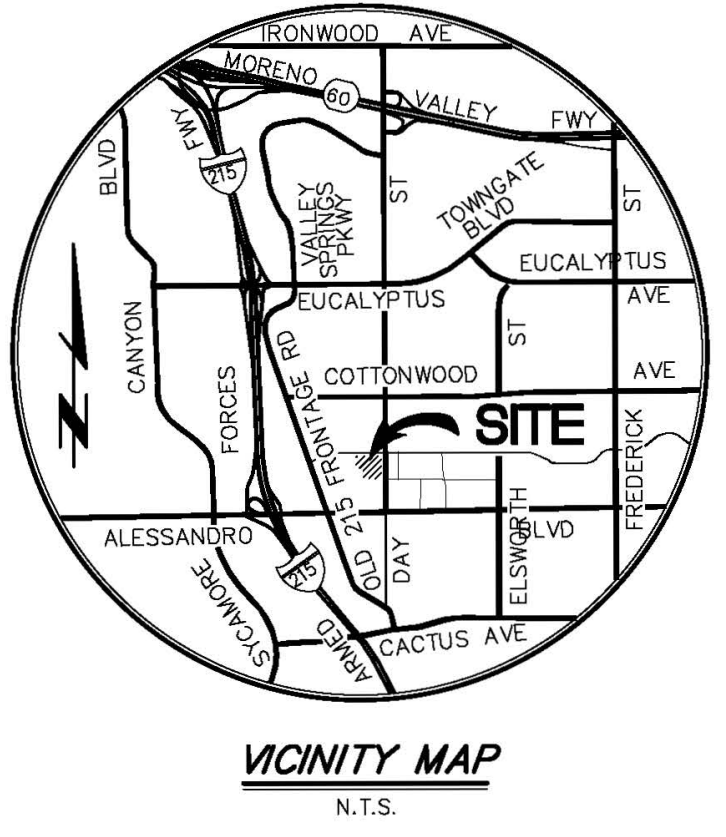
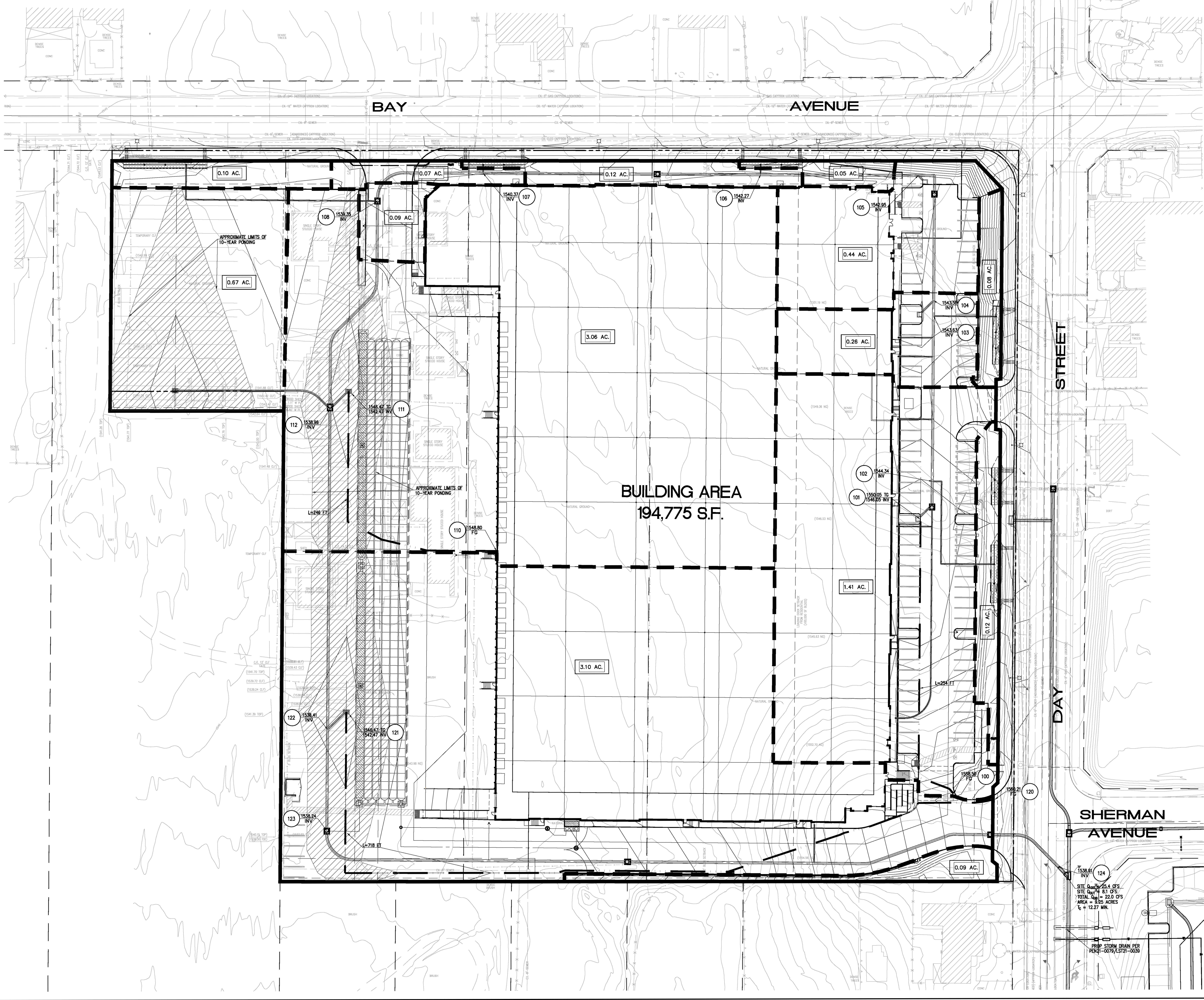
HYDROLOGY MAPS

EXISTING CONDITION MAP

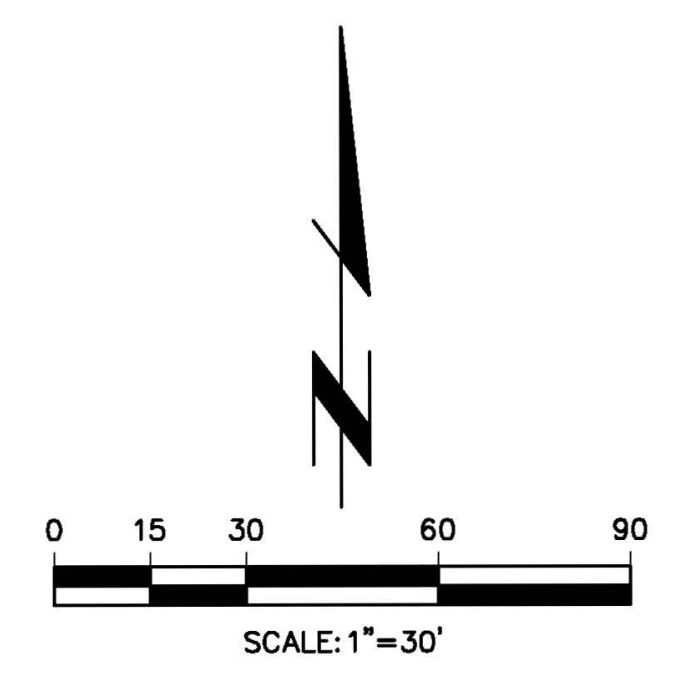


CITY OF MORENO VALLEY
PUBLIC WORKS DEPARTMENT
EXISTING CONDITION HYDROLOGY MAP
PEN23-0075 (LST23-0024)
BAY AND DAY INDUSTRIAL BUILDING
SOUTHWEST CORNER
OF
BAY AVENUE AND DAY STREET
MORENO VALLEY, CALIFORNIA

PROPOSED CONDITION MAP



LEGEND	
	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	FLOW PATH
	SUBAREA AREA
	NODE NUMBER
	LENGTH OF FLOW PATH
	TIME OF CONCENTRATION
	DISCHARGE (CUBIC FEET PER SECOND) NUMBER DESIGNATE YEAR OF FREQUENCY
	APPROXIMATE LIMITS OF 10-YEAR PONDING



PEN23-0075 (LST23-0024)

OWNER:
BAY & DAY LLC
ONE LINCOLN CENTRE
18W140 BUTTERFIELD ROAD, #750
OAKBROOK TERRACE, IL 60181
TEL: 630-576-1100

ENGINEER:
Thienes Engineering, Inc.
CIVIL ENGINEERING & LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA BREA, CALIFORNIA 90430
PH (714) 521-4811 FAX (714) 521-4173

CITY OF MORENO VALLEY
PUBLIC WORKS DEPARTMENT

PROPOSED CONDITION HYDROLOGY MAP
PEN23-0075 (LST23-0024)
BAY AND DAY INDUSTRIAL BUILDING
SOUTHWEST CORNER
OF
BAY AVENUE AND DAY STREET
MORENO VALLEY, CALIFORNIA

1 of 1 Sheets

JUN 30 2024