

Appendix G-3

(Site 3 - South Nance East)
Preliminary Hydrology Calculations For South
Nance Trailer Yard – East

Thienes Engineering, Inc.
January 27, 2023



Thienes Engineering, Inc.

CIVIL ENGINEERING • LAND SURVEYING

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

**SOUTH NANCE TRAILER YARD – EAST
NANCE STREET BETWEEN NEVADA AVE. AND WEBSTER AVE.
PERRIS, CALIFORNIA**

PREPARED FOR

**LAKE CREEK INDUSTRIAL, LLC
1302 BRITTANY CROSS ROAD
SANTA ANA, CALIFORNIA 92705**

JANUARY 27, 2023

JOB NO. 4130

PREPARED BY

**THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
(714) 521-4811**

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

SOUTH NANCE TRAILER YARD – EAST

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

INTRODUCTION

A: PROJECT LOCATION

The project site is located south of Nance Street between Patterson Avenue and Webster Avenue in the City of Perris, California. Please see next page for vicinity map.

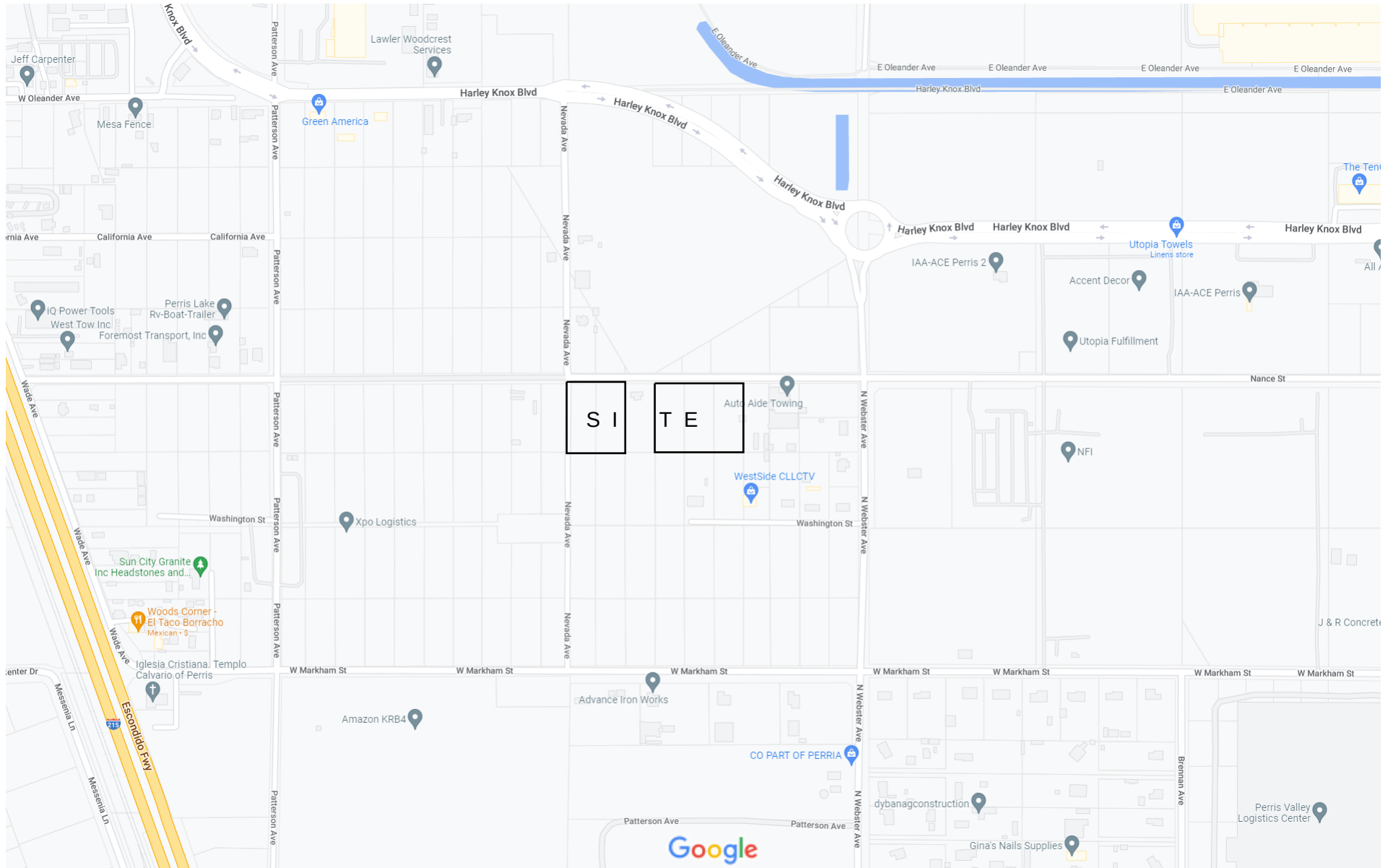
B: STUDY PURPOSE

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

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Brian Weil



APPENDIX

DESCRIPTION

A

REFERENCE MATERIALS

B

HYDROLOGY CALCULATIONS

C

DETENTION CALCULATIONS

D

HYDROLOGY MAPS

DISCUSSION

The project site encompasses approximately 2.73 acres. Proposed improvements to the site include truck parking. Proposed landscaping will be along the property lines.

Master Plan Hydrology

According to the 1991 Master Drainage Plan (MDP) for the Perris Valley Area, there is no master planned drainage facility adjacent to the project site. The MDP hydrology map indicates that drainage from the project site is tributary to Storm Drain Lateral B-5 in Webster Avenue to the east. The MDP facility has been constructed in Webster Avenue from Markham Avenue north to the Perris Valley Storm Channel, Line "B". Peak flow rates shown on existing storm drain plans are consistent with Webb and Associates updated hydrology for Lateral B-5.

The maps also indicate that Storm Drain Lateral B-6.1 in Nevada Avenue will extend to Nance Street and intercept offsite storm flows from the west of Nevada Avenue (projected). However, until Storm Drain Lateral B-6.1 is constructed and properties to the west are developed, storm flows generated south of Nance Street from Nevada Avenue (projected) west to Patterson Avenue will be tributary to Nance Street adjacent to the project.

See Appendix "A" for Master Plan reference material.

FEMA Flood Zone

The project site is located on Flood Insurance Rate MAP (FIRM) Number 06065C1430H that has an effective date of August 18, 2014. According to the FIRM, the project site is not within a designated flood zone.

See Appendix "A" for Flood Insurance Rate Map reference material.

Offsite

Offsite storm flows from the west are tributary to the project site. Tributary to the site are offsite flows from the adjacent lot to the west.

The offsite 100-year runoff from the adjacent lot to the west (Nodes 20-21, 0.91 acres) that is tributary to the site is approximately 1.3 cfs. These flows will be intercepted by a ditch along the west property line and conveyed through the project site in a storm drain that will “burp-out” to Nance Street.

See Appendix “B” for offsite hydrology calculations and Appendix “D” for offsite hydrology map (included on both the existing and proposed condition hydrology maps).

Existing Condition

The project site is currently vacant, undeveloped land. Runoff from the site generally drains from southwest to northeast.

The existing condition 100-year runoff from the site (Nodes 200-201, 2.73 acres) that is tributary to Nance Street is approximately 3.5 cfs.

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

Proposed Condition

The project will collect storm flows into an underground storm drain system and discharge to Nance Street via a burp-out structure.

The proposed condition unmitigated 100-year runoff from the site (Nodes 200-212, 2.63 acres) that is tributary to Nance Street is approximately 7.5 cfs.

There is also 0.10 acres of landscaping and driveway that drain directly to Nance Street.

See Appendix “B” for proposed condition hydrology calculations and Appendix “D” for 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. Therefore, there will be no negative impact on existing downstream drainage facilities.

A memo from the Riverside County Flood Control and Water Conservation District states: “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. Final design of the basin, including a complete hydrology study, will not be required until the improvement plan stage of this development.”.

Hydrographs were established using the area of the project site (site only, no offsite area) for the existing and proposed condition for the 10-year 24-hour design storm. The existing condition runoff volume is approximately 0.082 acre feet and the proposed condition runoff volume is approximately 0.516 acre feet, meaning the difference in the 10-year 24-hour storm runoff volume is approximately 0.434 acre-feet. This volume has been provided in the proposed truck yard at a depth of approximately 0.95’. Final design will include basin routing.

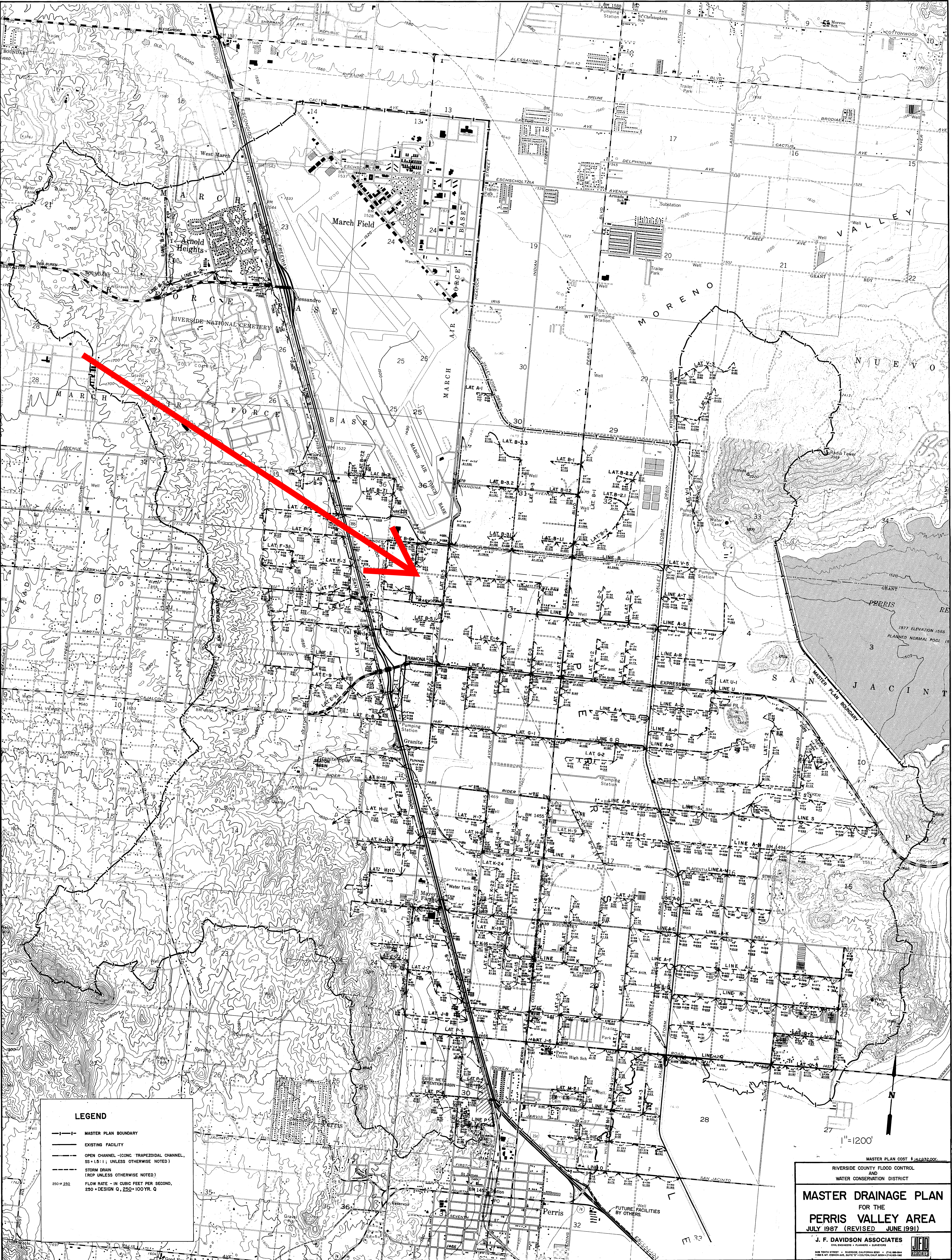
See Appendix “C” for existing and proposed condition hydrographs.

Methodology

Rational method hydrology calculations were computed using the Riverside County Rational Method program (by AES software). Flood hydrograph hydrology calculations were computed using the UNRIV program (by CivilDesign). The soil type is “B” per the Riverside County Flood Control and Water Conservation District Hydrology Manual. See Appendix “A” for reference materials.

APPENDIX A

REFERENCE MATERIALS



LEGEND

- MASTER PLAN BOUNDARY
- EXISTING FACILITY
- OPEN CHANNEL (CONC. TRAPEZOIDAL CHANNEL, 50' x 15' 11" UNLESS OTHERWISE NOTED)
- STORM DRAIN (RCP UNLESS OTHERWISE NOTED)
- FLOW RATE - IN CUBIC FEET PER SECOND, 250' DESIGN Q, 250' 100 YR. Q

MASTER PLAN COST \$1,342,832.00

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

MASTER DRAINAGE PLAN

FOR THE

PERRIS VALLEY AREA

JULY 1987 (REVISED JUNE 1991)

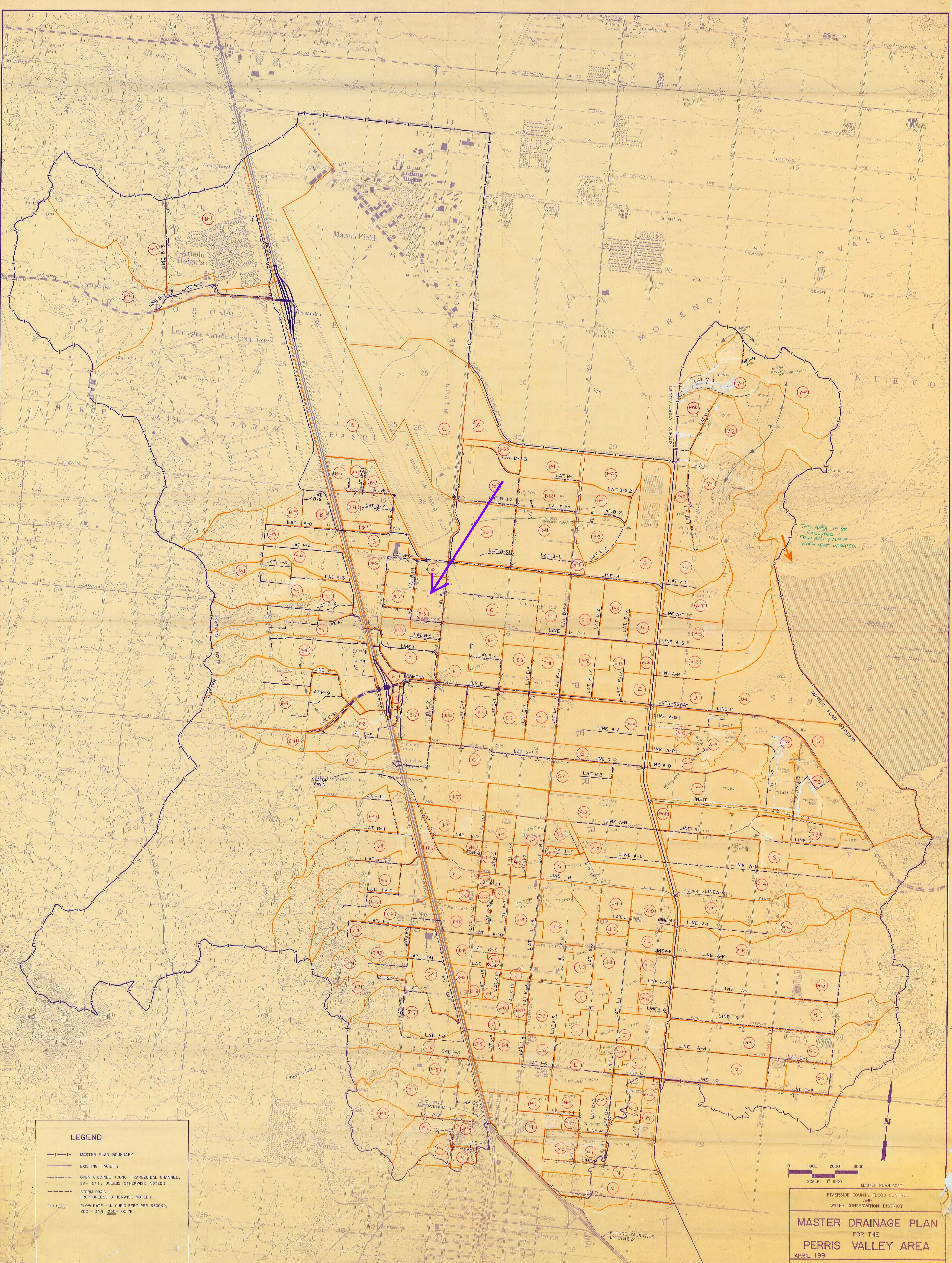
J. F. DAVIDSON ASSOCIATES

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JFDA

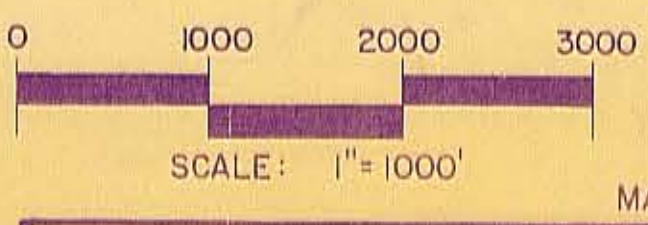
300 TENTH STREET • RIVERSIDE, CALIFORNIA 92501 • (714) 944-8844

1100 N. 1ST STREET, SUITE 100 • COVINGTON, LOUISIANA 70424



LEGEND

- MASTER PLAN BOUNDARY
- EXISTING FACILITY
- OPEN CHANNEL (CONC. TRAPEZOIDAL CHANNEL, SS = 1.5:1; UNLESS OTHERWISE NOTED)
- STORM DRAIN (RCP UNLESS OTHERWISE NOTED)
- FLOW RATE - IN CUBIC FEET PER SECOND, 250 = 10 YR, 250 = 100 YR



MASTER DRAINAGE PLAN
FOR THE
PERRIS VALLEY AREA
APRIL 1991

J. F. DAVIDSON ASSOCIATES

FACILITIES' DRAINAGE BOUNDARIES

8K3

8K3

1/2

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 08/23/16 File: B5.out

integra Pacific Industrial
100-Year Storm, Ultimate Conditions
Lateral B-5 Storm Drain

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

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

Program License Serial Number 4010

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

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

Standard intensity-duration curves data (Plate D-4.1)

For the [Perris Valley] area used.

10 year storm 10 minute intensity = 1.880 (In/Hr)

10 year storm 60 minute intensity = 0.780 (In/Hr)

100 year storm 10 minute intensity = 2.690 (In/Hr)

100 year storm 60 minute intensity = 1.120 (In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.120 (In/Hr)

Slope of intensity duration curve = 0.4900

+++++
Process from Point/Station 10.000 to Point/Station 11.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 708.000 (Ft.)

Top (of initial area) elevation = 1488.000 (Ft.)

Bottom (of initial area) elevation = 1482.700 (Ft.)

Difference in elevation = 5.300 (Ft.)

Slope = 0.00749 s(percent) = 0.75

TC = $k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 11.023 min.

Rainfall intensity = 2.569 (In/Hr) for a 100.0 year storm

COMMERCIAL subarea type

Runoff Coefficient = 0.874

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 1.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 0.000

RI index for soil (AMC 2) = 56.00

Pervious area fraction = 0.100; Impervious fraction = 0.900

Initial subarea runoff = 11.226 (CFS)

Total initial stream area = 5.000 (Ac.)

Pervious area fraction = 0.100

Process from Point/Station 11.000 to Point/Station 12.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1482.700(Ft.)
End of street segment elevation = 1477.500(Ft.)
Length of street segment = 653.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 22.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 16.086(CFS)
Depth of flow = 0.463(Ft.), Average velocity = 2.722(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 16.816(Ft.)
Flow velocity = 2.72(Ft/s)
Travel time = 4.00 min. TC = 15.02 min.
Adding area flow to street
COMMERCIAL subarea type
Runoff Coefficient = 0.871
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Rainfall intensity = 2.208(In/Hr) for a 100.0 year storm
Subarea runoff = 9.615(CFS) for 5.000(Ac.)
Total runoff = 20.841(CFS) Total area = 10.000(Ac.)
Street flow at end of street = 20.841(CFS)
Half street flow at end of street = 10.421(CFS)
Depth of flow = 0.499(Ft.), Average velocity = 2.900(Ft/s)
Flow width (from curb towards crown)= 18.620(Ft.)

Process from Point/Station 12.000 to Point/Station 13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1477.500(Ft.)
Downstream point/station elevation = 1476.500(Ft.)
Pipe length = 329.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 20.841(CFS)
Nearest computed pipe diameter = 30.00(In.)
Calculated individual pipe flow = 20.841(CFS)
Normal flow depth in pipe = 22.71(In.)
Flow top width inside pipe = 25.73(In.)
Critical Depth = 18.61(In.)
Pipe flow velocity = 5.23(Ft/s)
Travel time through pipe = 1.05 min.
Time of concentration (TC) = 16.07 min.

+++++
Process from Point/Station 12.000 to Point/Station 13.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 16.07 min.
Rainfall intensity = 2.136(In/Hr) for a 100.0 year storm
Subarea runoff = 18.590(CFS) for 10.000(Ac.)
Total runoff = 39.431(CFS) Total area = 20.000(Ac.)

+++++
Process from Point/Station 13.000 to Point/Station 14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1476.500(Ft.)
Downstream point/station elevation = 1474.550(Ft.)
Pipe length = 648.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 39.431(CFS)
Nearest computed pipe diameter = 39.00(In.)
Calculated individual pipe flow = 39.431(CFS)
Normal flow depth in pipe = 28.13(In.)
Flow top width inside pipe = 34.98(In.)
Critical Depth = 23.98(In.)
Pipe flow velocity = 6.15(Ft/s)
Travel time through pipe = 1.76 min.
Time of concentration (TC) = 17.83 min.

+++++
Process from Point/Station 13.000 to Point/Station 14.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 17.83 min.
Rainfall intensity = 2.030(In/Hr) for a 100.0 year storm
Subarea runoff = 35.297(CFS) for 20.000(Ac.)
Total runoff = 74.728(CFS) Total area = 40.000(Ac.)

+++++
Process from Point/Station 14.000 to Point/Station 15.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1474.550(Ft.)
Downstream point/station elevation = 1472.630(Ft.)
Pipe length = 642.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 74.728(CFS)
Nearest computed pipe diameter = 48.00(In.)
Calculated individual pipe flow = 74.728(CFS)
Normal flow depth in pipe = 37.41(In.)
Flow top width inside pipe = 39.81(In.)
Critical Depth = 31.39(In.)
Pipe flow velocity = 7.11(Ft/s)
Travel time through pipe = 1.50 min.
Time of concentration (TC) = 19.33 min.

+++++
Process from Point/Station 14.000 to Point/Station 15.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 57.30
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 19.33 min.
Rainfall intensity = 1.951(In/Hr) for a 100.0 year storm
Subarea runoff = 33.934(CFS) for 20.000(Ac.)
Total runoff = 108.662(CFS) Total area = 60.000(Ac.)

+++++
Process from Point/Station 15.000 to Point/Station 16.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1472.630(Ft.)
Downstream point/station elevation = 1472.340(Ft.)
Pipe length = 95.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 108.662(CFS)
Nearest computed pipe diameter = 54.00(In.)
Calculated individual pipe flow = 108.662(CFS)
Normal flow depth in pipe = 44.25(In.)
Flow top width inside pipe = 41.54(In.)
Critical Depth = 36.79(In.)
Pipe flow velocity = 7.79(Ft/s)
Travel time through pipe = 0.20 min.
Time of concentration (TC) = 19.53 min.

+++++
Process from Point/Station 15.000 to Point/Station 16.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.868
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 19.53 min.
Rainfall intensity = 1.941(In/Hr) for a 100.0 year storm
Subarea runoff = 22.589(CFS) for 13.400(Ac.)
Total runoff = 131.251(CFS) Total area = 73.400(Ac.)

+++++
Process from Point/Station 16.000 to Point/Station 17.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

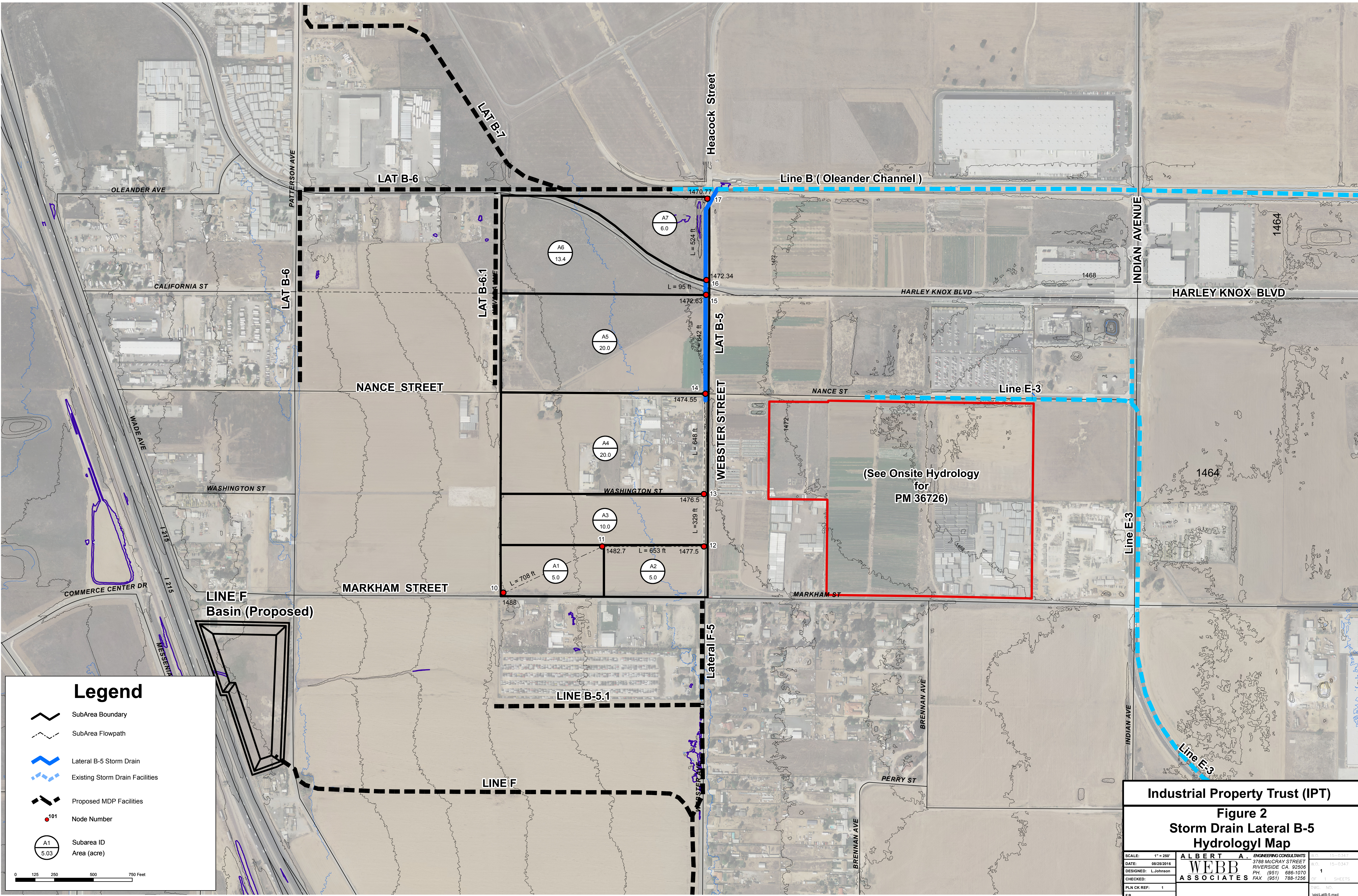
Upstream point/station elevation = 1472.340(Ft.)
Downstream point/station elevation = 1470.770(Ft.)
Pipe length = 524.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 131.251(CFS)
Nearest computed pipe diameter = 57.00(In.)
Calculated individual pipe flow = 131.251(CFS)
Normal flow depth in pipe = 50.25(In.)
Flow top width inside pipe = 36.83(In.)
Critical Depth = 39.94(In.)
Pipe flow velocity = 7.93(Ft/s)
Travel time through pipe = 1.10 min.
Time of concentration (TC) = 20.63 min.

+++++
Process from Point/Station 16.000 to Point/Station 17.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.868
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 20.63 min.
Rainfall intensity = 1.890(In/Hr) for a 100.0 year storm
Subarea runoff = 9.840(CFS) for 6.000(Ac.)
Total runoff = 141.090(CFS) Total area = 79.400(Ac.)
End of computations, total study area = 79.40 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.100
Area averaged RI index number = 56.3

Part: C:\2015\15-0347\GIS\LatB-5.mxd



Legend

- SubArea Boundary
- SubArea Flowpath
- Lateral B-5 Storm Drain
- Existing Storm Drain Facilities
- Proposed MDP Facilities
- Node Number
- Subarea ID
Area (acre)

0

125

250

500

750 Feet

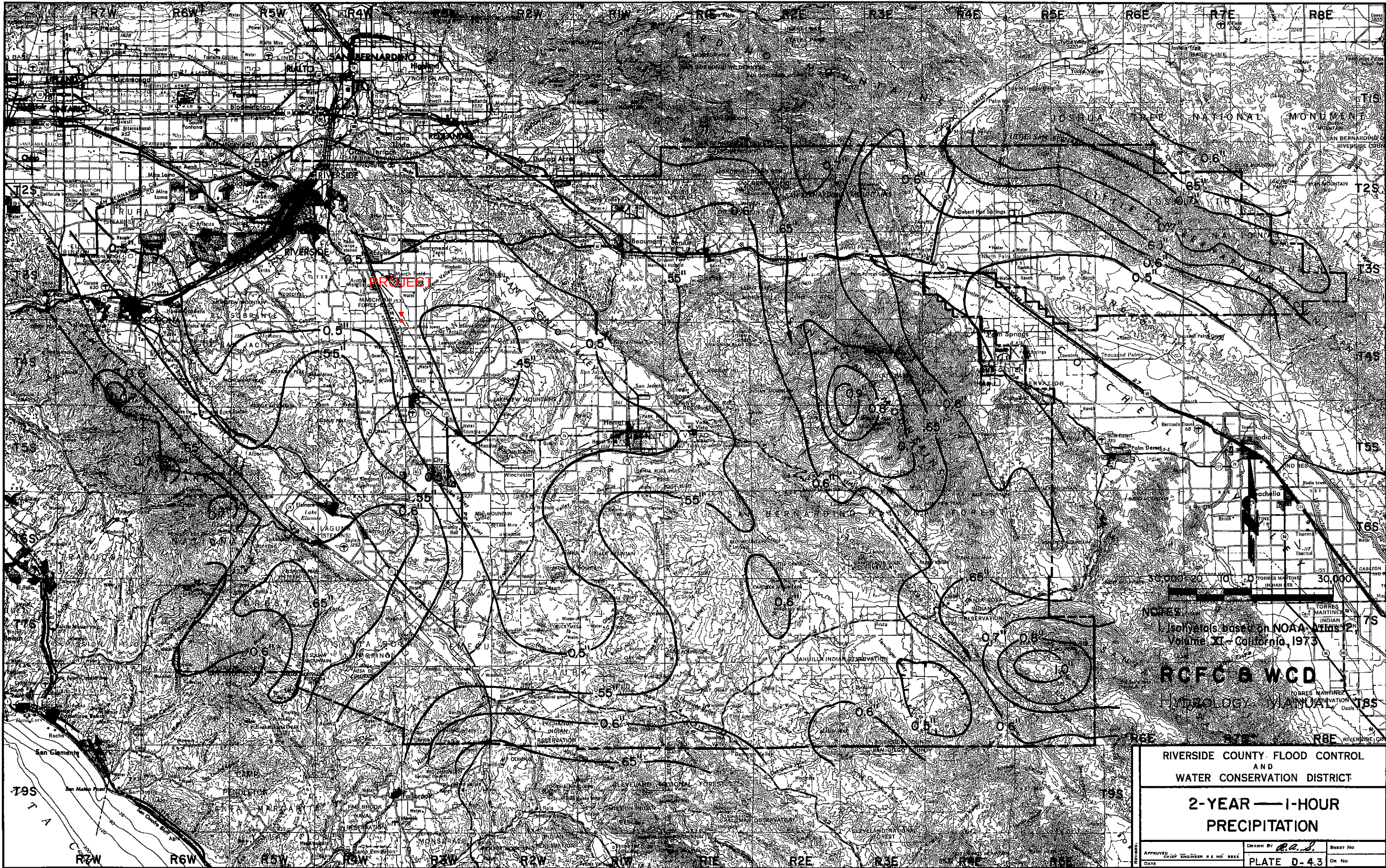
Industrial Property Trust (IPT)

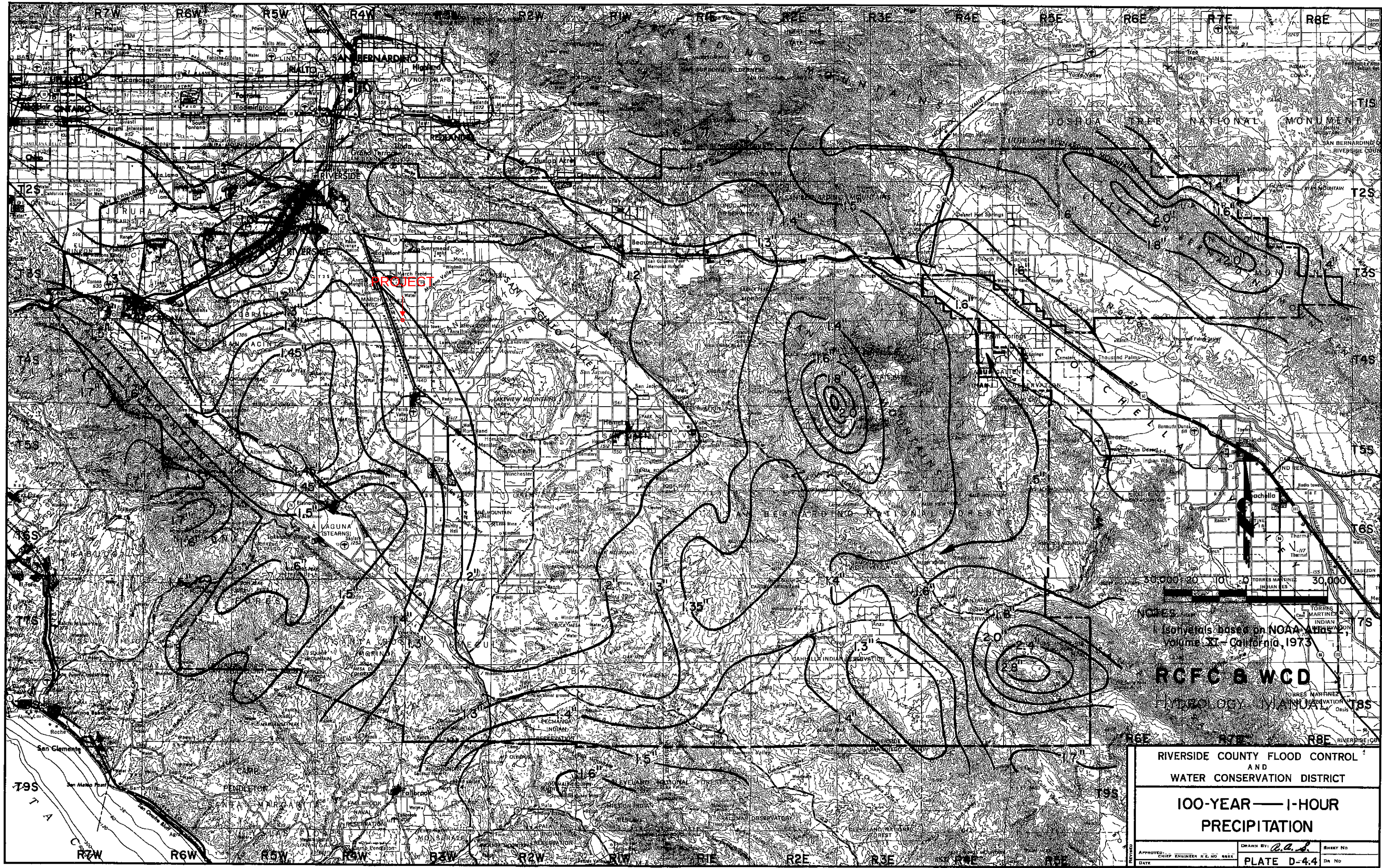
Figure 2

Storm Drain Lateral B-5

Hydrology Map

SCALE: 1" = 250'	ALBERT A. ENGINEERING CONSULTANTS	D.O. 15-0347
DATE: 08/25/2016	3788 McCRAY STREET	D.O. 15-0347
DESIGNED: L.Johnson	RIVERSIDE CA 92506	1
CHECKED:	PH: (951) 686-1070	OF 1 SHEETS
PLN OK REF: 1	FAX: (951) 788-1256	
F.B.		INC. NO.
		1509LatB-5.mxd





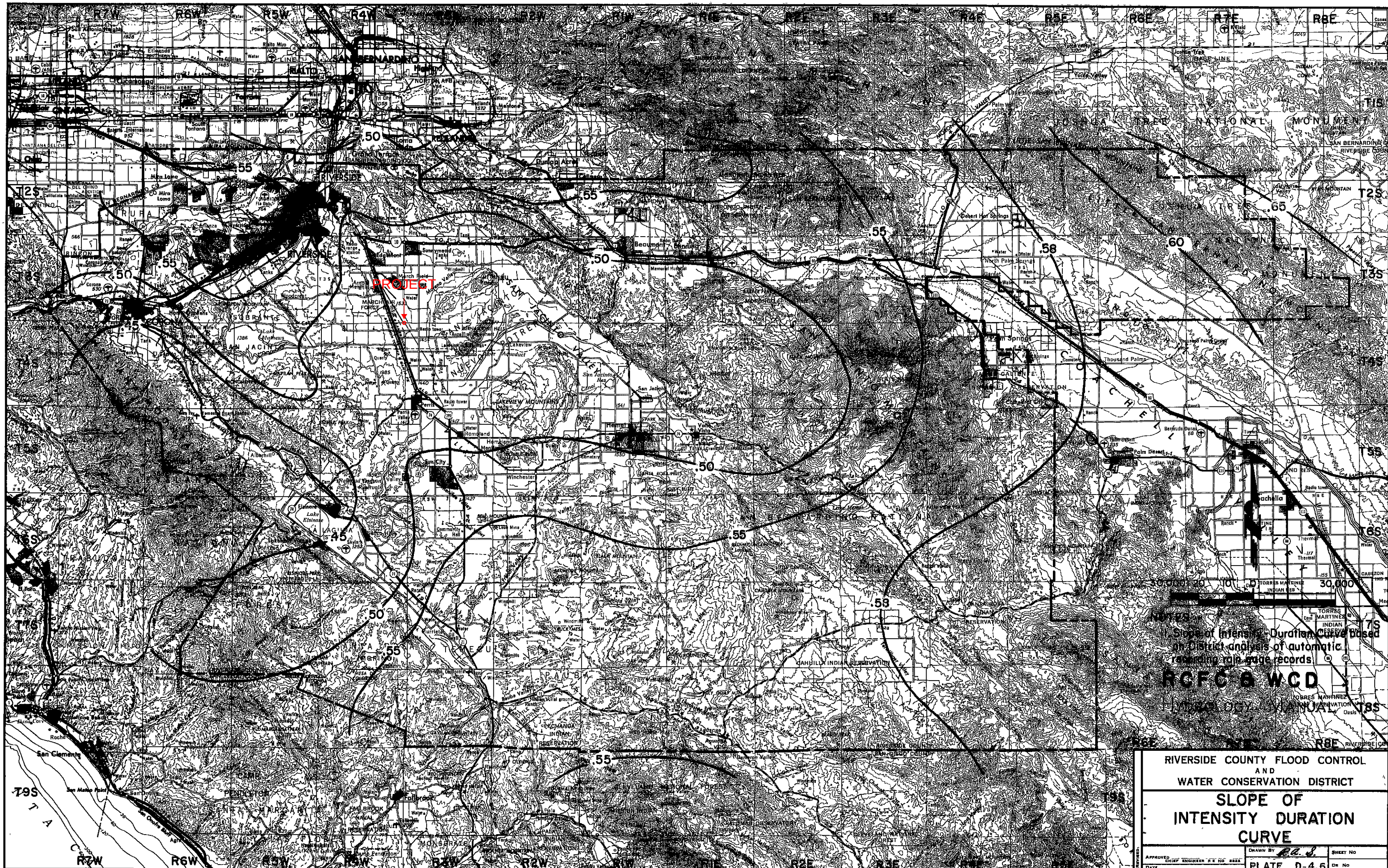
Contours based on NOAA Atlas,
Volume XI - California, 1973

RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

**100-YEAR — 1-HOUR
PRECIPITATION**

APPROVED: CHIEF ENGINEER R.E. NO. 442
DATE: _____
DRAWN BY: *P.A.L.*
SHEET NO. _____
PLATE D-4-4
DN NO. _____



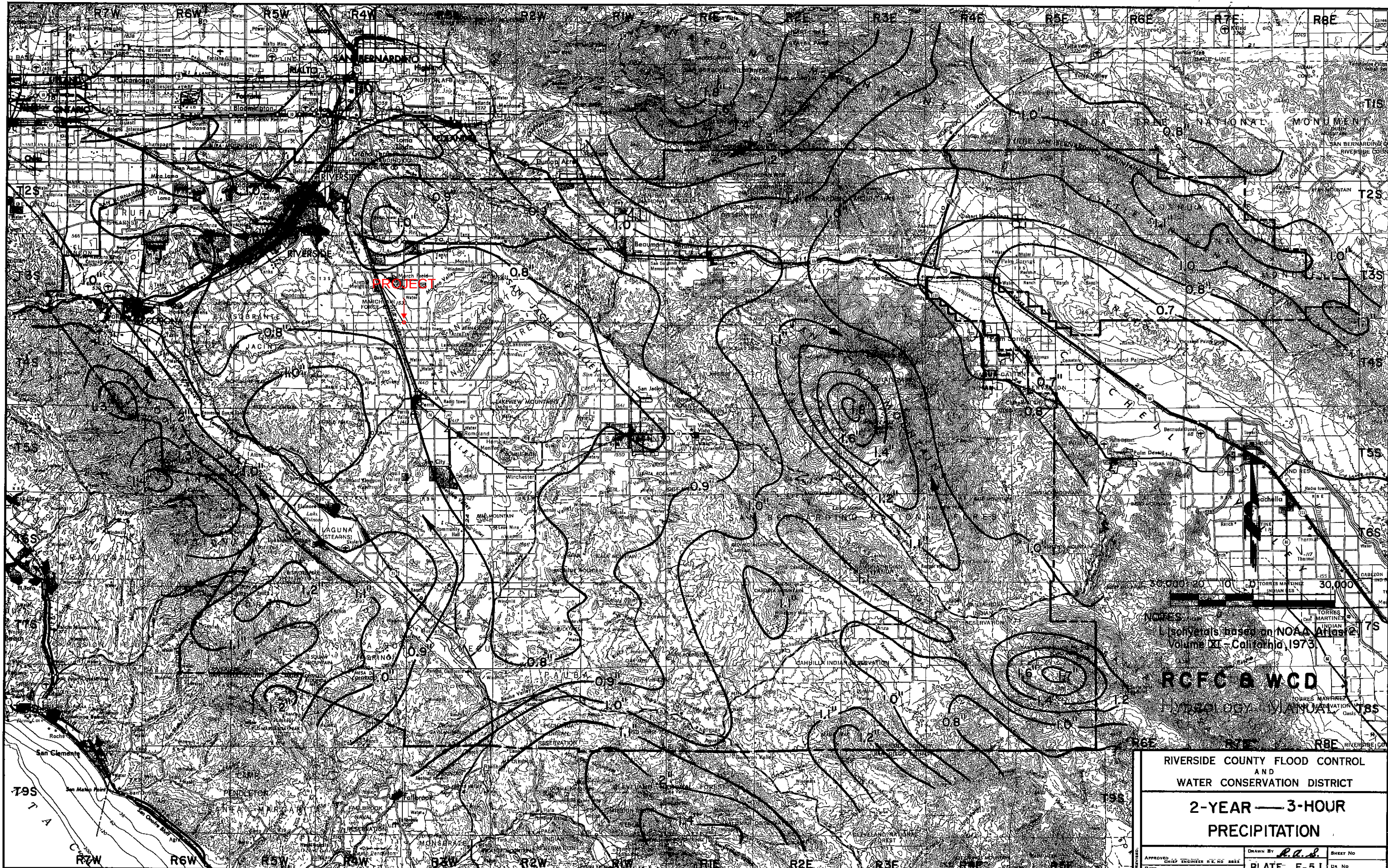
Slope of Intensity Duration Curve based on District analysis of automatic recording rain gage records

RCFC & WCD

INTEGRITY

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SLOPE OF
INTENSITY DURATION
CURVE

APPROVED	CHIEF ENGINEER R.E. NO. 8888	DRAWN BY	PLATE D-4.6	SHEET NO.	OR NO.
DATE					

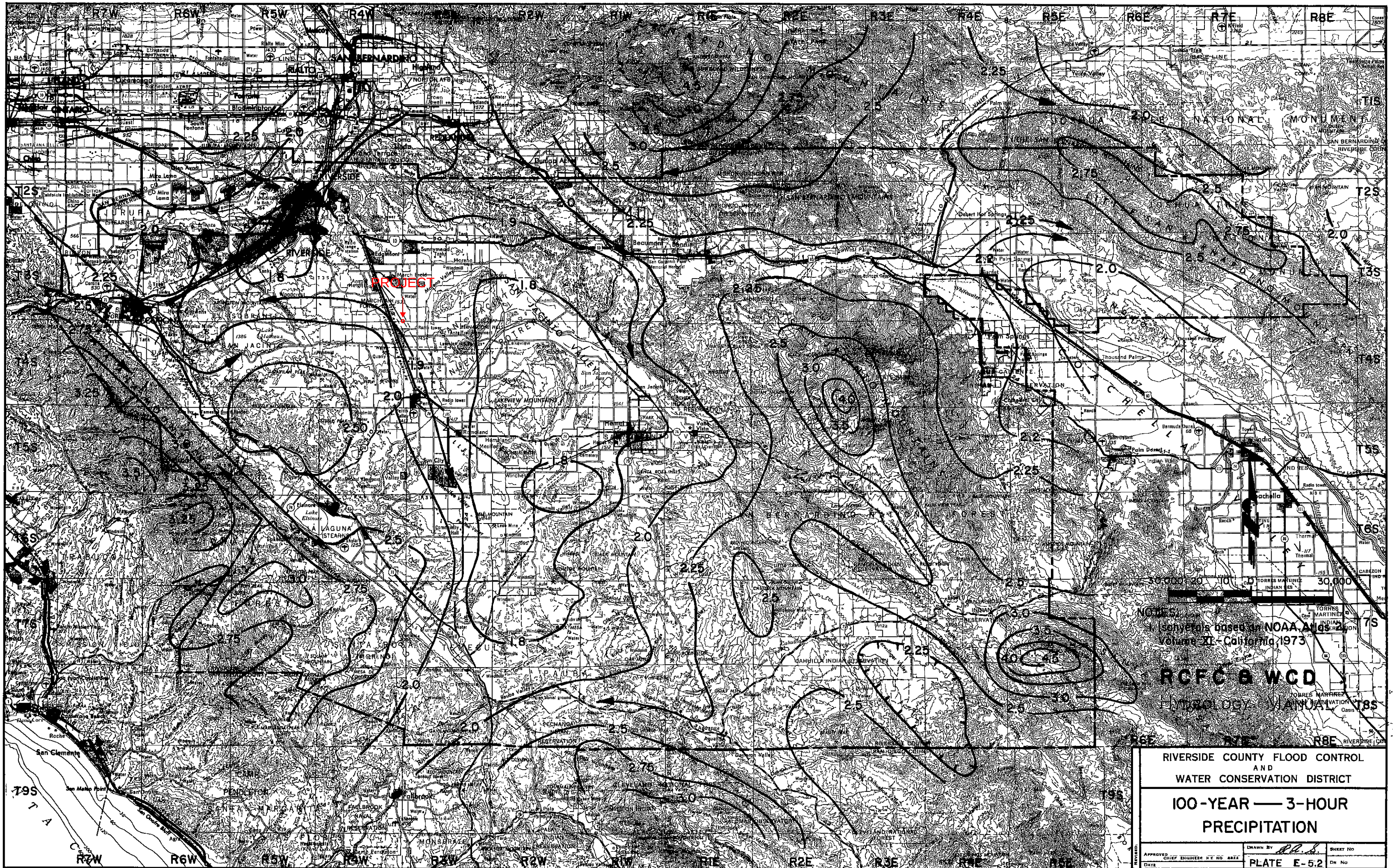


Contours based on NOAA Atlas 2
Volume XI - California, 1973

RCFC & WCD

1974-1975 MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
2-YEAR — 3-HOUR PRECIPITATION		
APPROVED DATE: _____	CHIEF ENGINEER R.E. NO. 888	DRAWN BY <i>R.E.L.</i>
PLATE E-5.1		SHEET No. DR No.



Contours based on NOAA Atlas 2
Volume XI - California, 1973

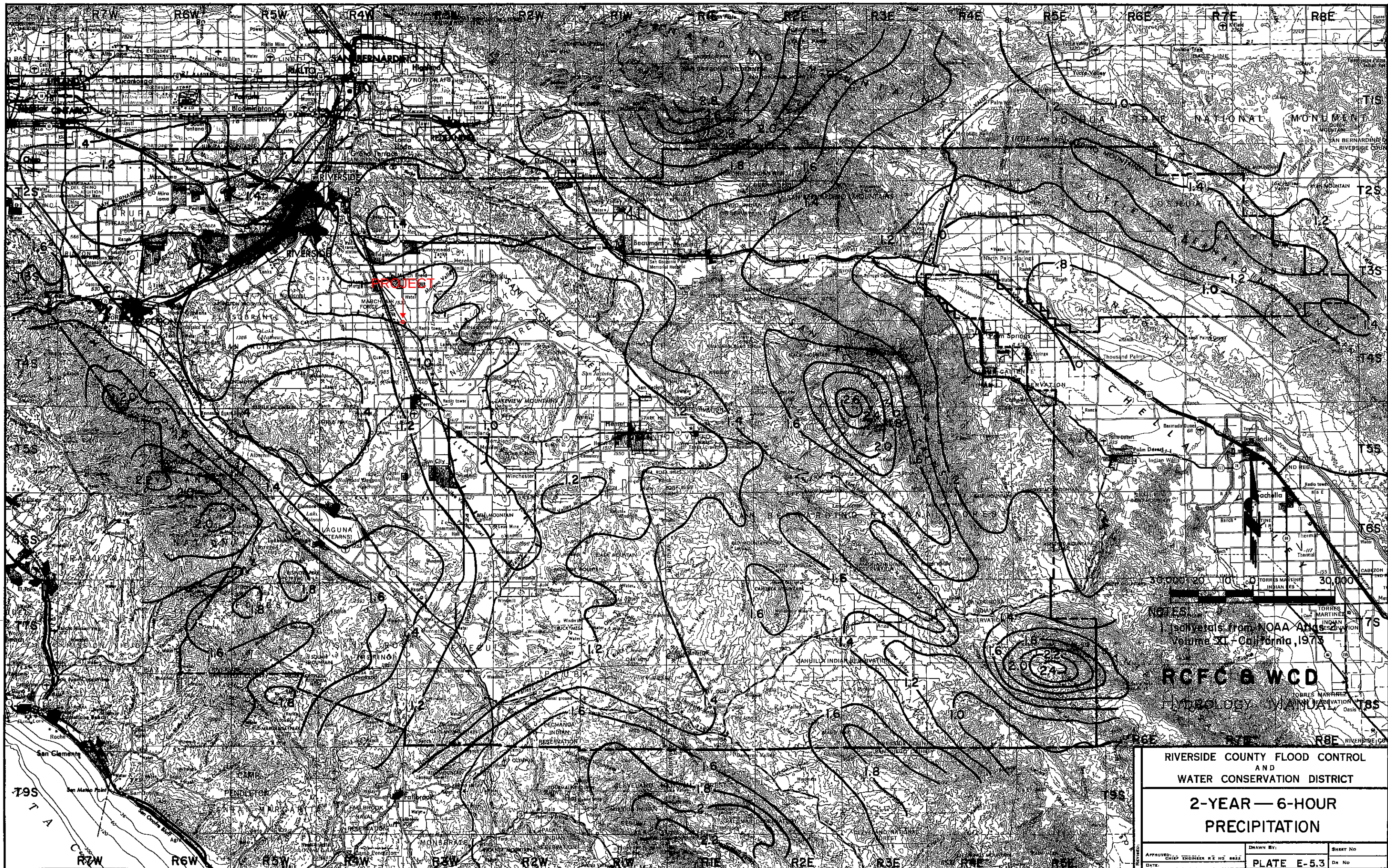
RCFC & WCD

HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

100-YEAR — 3-HOUR
PRECIPITATION

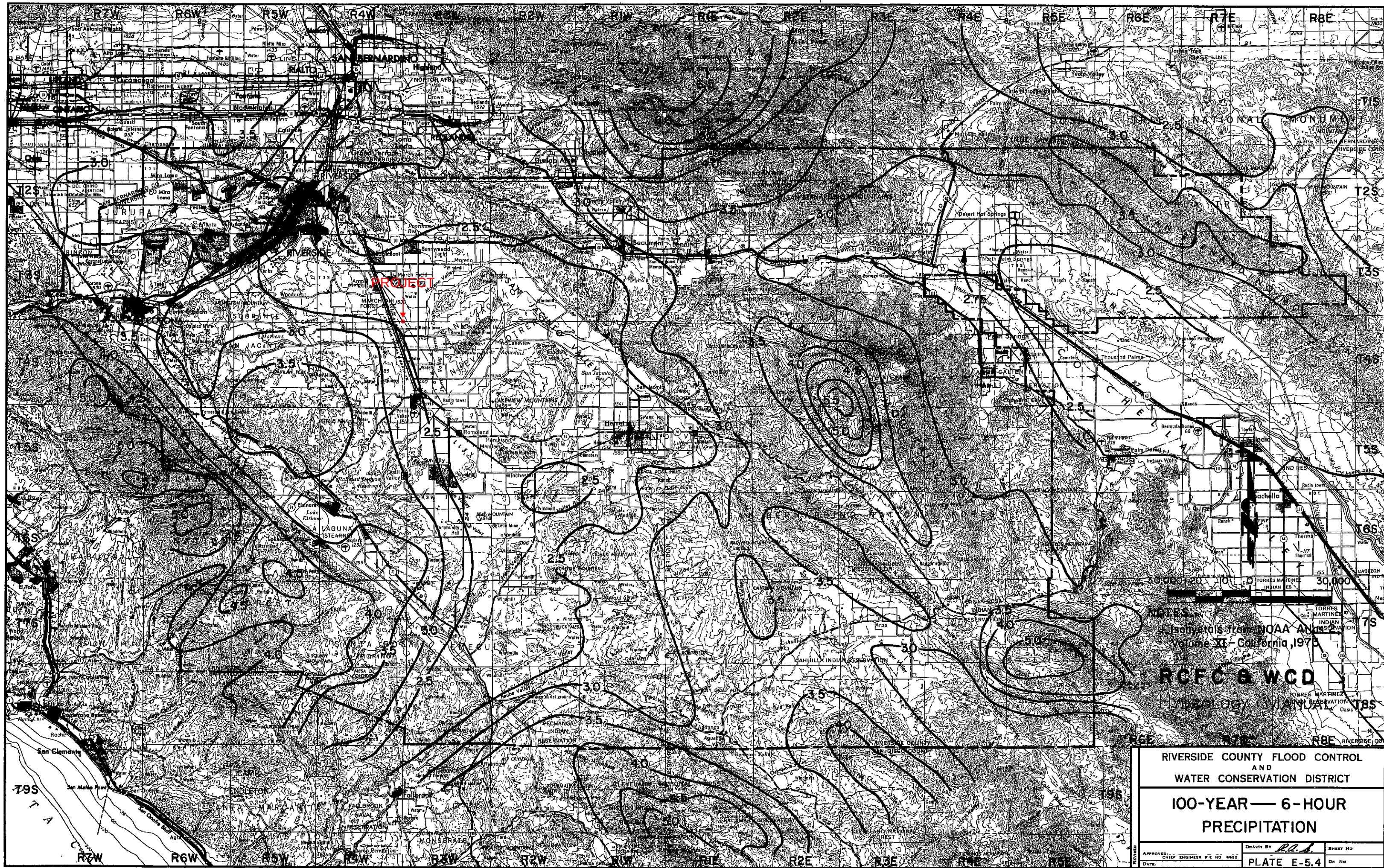
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DATE	PLATE E-5.2	DR. NO.

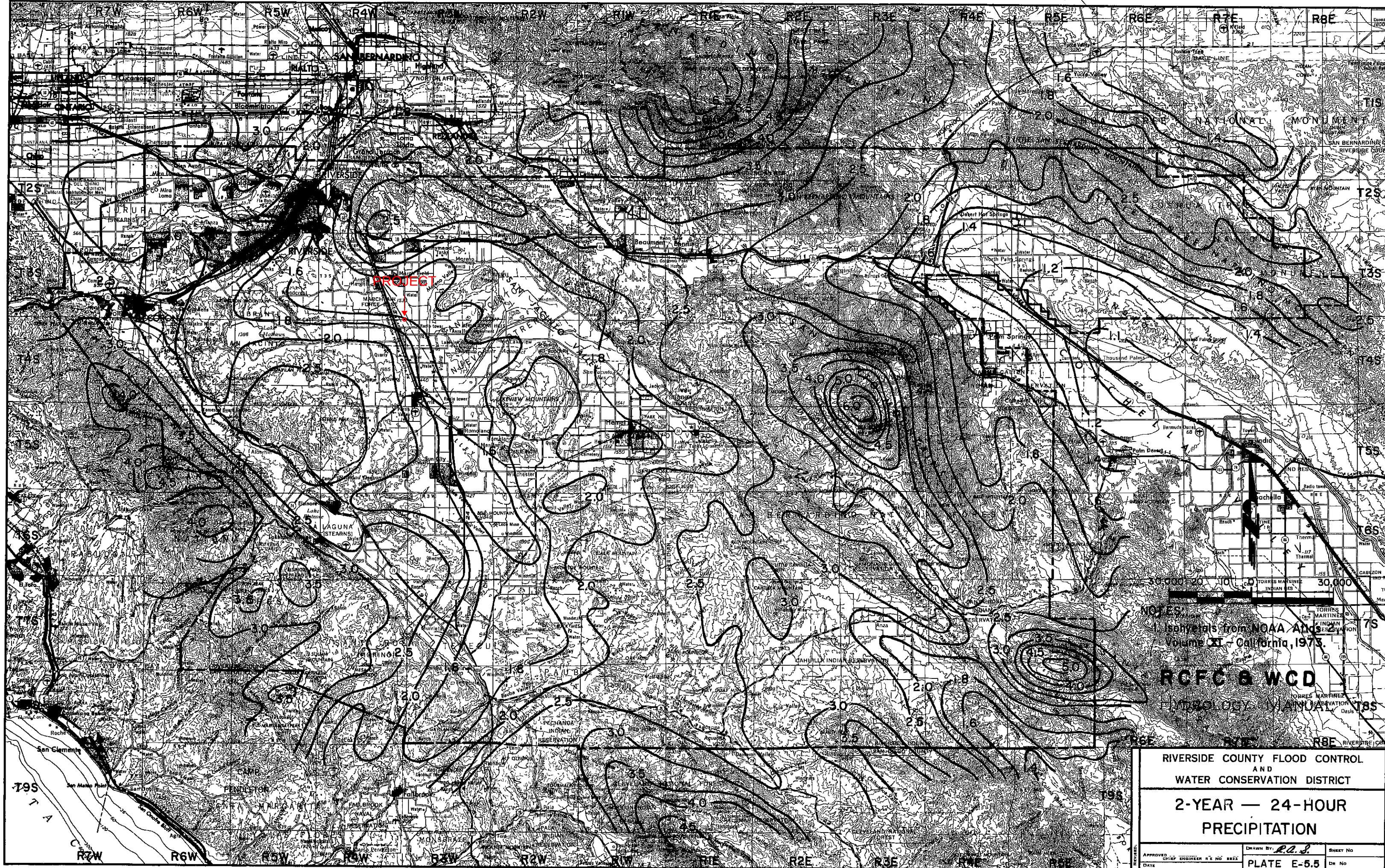


Isopleths from NOAA Atlas 6
Volume XI - California, 1973

RCFC & WCD
HYDROLOGY MANUAL

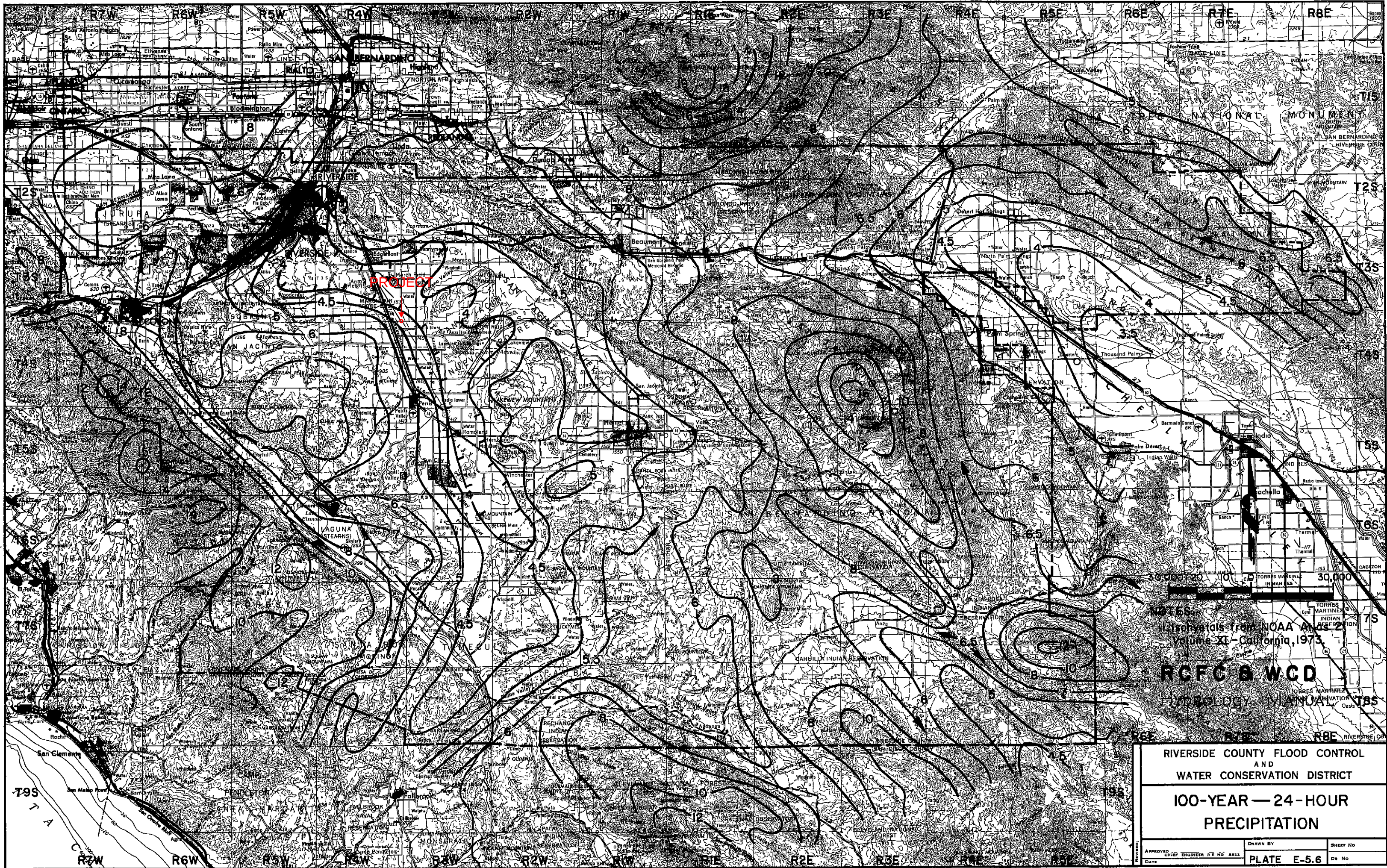
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
2-YEAR — 6-HOUR PRECIPITATION		
APPROVED: DATE: CHIEF ENGINEER W.E. NO. 8822	DRAWN BY: DATE: PLATE E-5.3	SHEET NO. DATE: DA NO.





NOTES:
Isobars from NOAA Atlas
Volume XI - California, 1973.
RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
2-YEAR — 24-HOUR PRECIPITATION		
APPROVED CHIEF ENGINEER R.E. NO. 8823	DRAWN BY: <i>P.O.S.</i>	SHEET NO.
DATE	PLATE E-5.5	OR NO.



Isobars from NOAA Atlas 2
Volume XI - California, 1973

RCFC & WCD

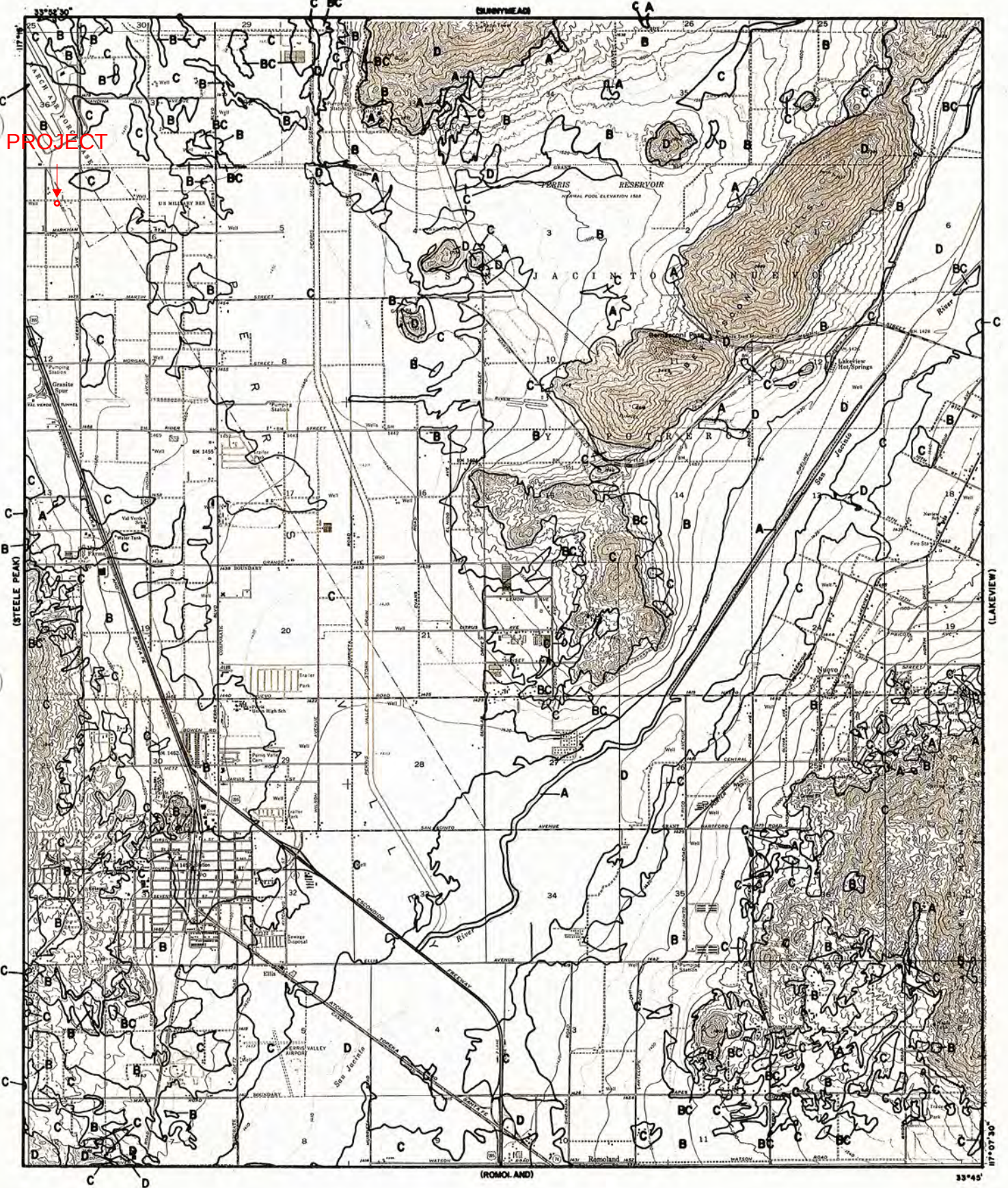
HYDROLOGY MANUAL

**RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT**

**100-YEAR — 24-HOUR
PRECIPITATION**

APPROVED	DATE	CHIEF ENGINEER	DATE	DRAWN BY	SHEET NO
				PLATE E-5.6	Dr No

PROJECT



LEGEND

- SOILS GROUP BOUNDARY
- A SOILS GROUP DESIGNATION

RCFC&WCD
HYDROLOGY MANUAL



**HYDROLOGIC SOILS GROUP MAP
FOR
PERRIS**

APPENDIX B

HYDROLOGY CALCULATIONS

OFFSITE

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 *****

* SOUTH NANCE TRAILER YARD - PERRIS *
* OFFSITE - EAST - NODES 20-21 *
* HYDROLOGIC ANALYSIS - 100-YEAR *

FILE NAME: 41300FEC.DAT
TIME/DATE OF STUDY: 16:00 01/23/2023

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
2-YEAR, 1-HOUR PRECIPITATION(INCH) = 0.470
100-YEAR, 1-HOUR PRECIPITATION(INCH) = 1.230

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.230

SLOPE OF INTENSITY DURATION CURVE = 0.5000

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- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH LIP (FT) (FT)	HIKE (FT)	MANNING FACTOR (n)
NO.	(FT)	(FT)		(FT)	(FT)	(FT)	
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 20.00 TO NODE 21.00 IS CODE = 21

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

ASSUMED INITIAL SUBAREA UNIFORM

DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER

TC = $K * [(LENGTH^{**3}) / (ELEVATION\ CHANGE)]^{**0.2}$

INITIAL SUBAREA FLOW-LENGTH(FEET) = 386.00

UPSTREAM ELEVATION(FEET) = 1483.00

DOWNSTREAM ELEVATION(FEET) = 1481.10

ELEVATION DIFFERENCE(FEET) = 1.90

TC = $0.533 * [(386.00^{**3}) / (1.90)]^{**0.2}$ = 16.696

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.332

UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6210

SOIL CLASSIFICATION IS "B"

SUBAREA RUNOFF(CFS) = 1.32

TOTAL AREA(ACRES) = 0.91 TOTAL RUNOFF(CFS) = 1.32
=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)	=	0.9	TC(MIN.) =	16.70
PEAK FLOW RATE(CFS)	=	1.32		

=====

=====

END OF RATIONAL METHOD ANALYSIS

EXISTING CONDITION

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 *****

* SOUTH NANCE TRAILER YARD - PERRIS *
* EXISTING CONDITION - EAST - NODES 200-201 *
* HYDROLOGIC ANALYSIS - 100-YEAR *

FILE NAME: 4130EXEC.DAT
TIME/DATE OF STUDY: 16:00 01/23/2023

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
2-YEAR, 1-HOUR PRECIPITATION(INCH) = 0.470
100-YEAR, 1-HOUR PRECIPITATION(INCH) = 1.230

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.230

SLOPE OF INTENSITY DURATION CURVE = 0.5000

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- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH LIP (FT) (FT)	HIKE (FT)	MANNING FACTOR (n)
NO.	(FT)	(FT)		(FT)	(FT)	(FT)	
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 200.00 TO NODE 201.00 IS CODE = 21

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

ASSUMED INITIAL SUBAREA UNIFORM

DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER

TC = $K * [(LENGTH^{**3}) / (ELEVATION\ CHANGE)]^{**0.2}$

INITIAL SUBAREA FLOW-LENGTH(FEET) = 616.00

UPSTREAM ELEVATION(FEET) = 1481.60

DOWNSTREAM ELEVATION(FEET) = 1478.30

ELEVATION DIFFERENCE(FEET) = 3.30

TC = $0.533 * [(616.00^{**3}) / (3.30)]^{**0.2}$ = 19.790

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.142

UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6044

SOIL CLASSIFICATION IS "B"

SUBAREA RUNOFF(CFS) = 3.53

TOTAL AREA(ACRES) = 2.73 TOTAL RUNOFF(CFS) = 3.53
=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)	=	2.7	TC(MIN.)	=	19.79
PEAK FLOW RATE(CFS)	=	3.53			

=====

=====

END OF RATIONAL METHOD ANALYSIS

PROPOSED CONDITION

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 *****
* SOUTH NANCE TRAILER YARD - PERRIS *
* PROPOSED CONDITION - EAST - NODES 200-212 *
* HYDROLOGIC ANALYSIS - 100-YEAR *

FILE NAME: 4130PREC.DAT
TIME/DATE OF STUDY: 10:00 01/26/2023

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
2-YEAR, 1-HOUR PRECIPITATION(INCH) = 0.470
100-YEAR, 1-HOUR PRECIPITATION(INCH) = 1.230

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 100.00 1-HOUR INTENSITY(INCH/HOUR) = 1.230

SLOPE OF INTENSITY DURATION CURVE = 0.5000

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- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH LIP (FT) (FT)	HIKE (FT)	MANNING FACTOR (n)
NO.	=====	=====	=====	=====	=====	=====	=====
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 200.00 TO NODE 201.00 IS CODE = 21

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

ASSUMED INITIAL SUBAREA UNIFORM

DEVELOPMENT IS COMMERCIAL

TC = $K * [(LENGTH^{**3}) / (ELEVATION\ CHANGE)]^{**0.2}$

INITIAL SUBAREA FLOW-LENGTH(FEET) = 75.00

UPSTREAM ELEVATION(FEET) = 1480.31

DOWNSTREAM ELEVATION(FEET) = 1479.23

ELEVATION DIFFERENCE(FEET) = 1.08

TC = $0.303 * [(75.00^{**3}) / (1.08)]^{**0.2} = 3.980$

COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.261

COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8822

SOIL CLASSIFICATION IS "B"

SUBAREA RUNOFF(CFS) = 0.41

TOTAL AREA(ACRES) = 0.11 TOTAL RUNOFF(CFS) = 0.41


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*****
FLOW PROCESS FROM NODE      201.00 TO NODE      211.00 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1475.23  DOWNSTREAM(FEET) = 1474.85
FLOW LENGTH(FEET) = 242.00  MANNING'S N = 0.012
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
DEPTH OF FLOW IN 12.0 INCH PIPE IS 4.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 1.61
ESTIMATED PIPE DIAMETER(INCH) = 12.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.41
PIPE TRAVEL TIME(MIN.) = 2.50  Tc(MIN.) = 7.50
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 211.00 = 317.00 FEET.

*****
FLOW PROCESS FROM NODE      211.00 TO NODE      211.00 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.) = 7.50
RAINFALL INTENSITY(INCH/HR) = 3.48
TOTAL STREAM AREA(ACRES) = 0.11
PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.41

*****
FLOW PROCESS FROM NODE      210.00 TO NODE      211.00 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) = 392.00
UPSTREAM ELEVATION(FEET) = 1481.94
DOWNSTREAM ELEVATION(FEET) = 1478.85
ELEVATION DIFFERENCE(FEET) = 3.09
TC = 0.303*[( 392.00**3)/( 3.09)]**.2 = 8.701
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.230
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8780
SOIL CLASSIFICATION IS "B"
SUBAREA RUNOFF(CFS) = 7.15
TOTAL AREA(ACRES) = 2.52  TOTAL RUNOFF(CFS) = 7.15

*****
FLOW PROCESS FROM NODE      211.00 TO NODE      211.00 IS CODE =  1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 8.70
RAINFALL INTENSITY(INCH/HR) = 3.23
TOTAL STREAM AREA(ACRES) = 2.52
PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.15

** CONFLUENCE DATA **
STREAM      RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)      (MIN.)  (INCH/HOUR)  (ACRE)
1           0.41      7.50      3.478      0.11
2           7.15      8.70      3.230      2.52

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	6.58	7.50	3.478
2	7.53	8.70	3.230

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7.53 Tc(MIN.) = 8.70

TOTAL AREA(ACRES) = 2.6

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 211.00 = 392.00 FEET.

FLOW PROCESS FROM NODE 211.00 TO NODE 212.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1474.85 DOWNSTREAM(FEET) = 1474.12

FLOW LENGTH(FEET) = 145.00 MANNING'S N = 0.012

DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.1 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 5.08

ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 7.53

PIPE TRAVEL TIME(MIN.) = 0.48 Tc(MIN.) = 9.18

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 212.00 = 537.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2.6 TC(MIN.) = 9.18

PEAK FLOW RATE(CFS) = 7.53

*** PEAK FLOW RATE TABLE ***

	Q(CFS)	Tc(MIN.)
1	6.58	7.99
2	7.53	9.18

END OF RATIONAL METHOD ANALYSIS

APPENDIX C

DETENTION CALCULATIONS

EASTERLY TRAILER YARD

Truck yard Volume

Elevation	Depth (feet)	Area (sq. ft.)	Volume (c.f.)	Σ Volume (c.f.)	Σ Volume (ac-ft)
1478.85	0.00	0			
			148	148	0.00
1479.00	0.15	1969			
			371	519	0.01
1479.10	0.25	5458			
			792	1311	0.03
1479.20	0.35	10386			
			1331	2642	0.06
1479.30	0.45	16233			
			1958	4600	0.11
1479.40	0.55	22926			
			2655	7255	0.17
1479.50	0.65	30174			
			3331	10586	0.24
1479.60	0.75	36450			
			3881	14467	0.33
1479.70	0.85	41170			
			4322	18789	0.43
1479.80	0.95	45265			
			4727	23516	0.54
1479.90	1.05	49275			

EXISTING CONDITION

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 01/23/23 File: 4130EE102410.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

SOUTH NANCE TRAILER YARD - PERRIS
EXISTING CONDITION - EAST
HYDROLOGIC ANALYSIS - 10-YEAR

Drainage Area = 2.73(Ac.) = 0.004 Sq. Mi.
Drainage Area for Depth-Area Areal Adj. = 2.73(Ac.) = 0.004 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.000 Hr.
Lag time = 0.00 Min.
25% of lag time = 0.00 Min.
40% of lag time = 0.00 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.73	1.62	4.42

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.73	4.40	12.01

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.620(In)
Area Averaged 100-Year Rainfall = 4.400(In)

Point rain (area averaged) = 2.764(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.764(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.730	76.00	0.000
Total Area Entered = 2.73(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
76.0	76.0	0.291	0.000	0.291	1.000	0.291

Sum (F) = 0.291

Area averaged mean soil loss (F) (In/Hr) = 0.291
 Minimum soil loss rate ((In/Hr)) = 0.146
 (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	1.#IO	100.000	2.751
	Sum =	100.000	Sum= 2.751

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	0.022	(0.516)	0.020	0.002
2	0.17	0.07	0.022	(0.514)	0.020	0.002
3	0.25	0.07	0.022	(0.512)	0.020	0.002
4	0.33	0.10	0.033	(0.510)	0.030	0.003
5	0.42	0.10	0.033	(0.508)	0.030	0.003
6	0.50	0.10	0.033	(0.506)	0.030	0.003
7	0.58	0.10	0.033	(0.504)	0.030	0.003
8	0.67	0.10	0.033	(0.502)	0.030	0.003
9	0.75	0.10	0.033	(0.500)	0.030	0.003
10	0.83	0.13	0.044	(0.498)	0.040	0.004
11	0.92	0.13	0.044	(0.496)	0.040	0.004
12	1.00	0.13	0.044	(0.494)	0.040	0.004
13	1.08	0.10	0.033	(0.493)	0.030	0.003
14	1.17	0.10	0.033	(0.491)	0.030	0.003
15	1.25	0.10	0.033	(0.489)	0.030	0.003
16	1.33	0.10	0.033	(0.487)	0.030	0.003
17	1.42	0.10	0.033	(0.485)	0.030	0.003
18	1.50	0.10	0.033	(0.483)	0.030	0.003
19	1.58	0.10	0.033	(0.481)	0.030	0.003
20	1.67	0.10	0.033	(0.479)	0.030	0.003
21	1.75	0.10	0.033	(0.477)	0.030	0.003
22	1.83	0.13	0.044	(0.475)	0.040	0.004
23	1.92	0.13	0.044	(0.473)	0.040	0.004
24	2.00	0.13	0.044	(0.471)	0.040	0.004
25	2.08	0.13	0.044	(0.469)	0.040	0.004
26	2.17	0.13	0.044	(0.467)	0.040	0.004
27	2.25	0.13	0.044	(0.466)	0.040	0.004
28	2.33	0.13	0.044	(0.464)	0.040	0.004
29	2.42	0.13	0.044	(0.462)	0.040	0.004
30	2.50	0.13	0.044	(0.460)	0.040	0.004
31	2.58	0.17	0.055	(0.458)	0.050	0.006
32	2.67	0.17	0.055	(0.456)	0.050	0.006
33	2.75	0.17	0.055	(0.454)	0.050	0.006
34	2.83	0.17	0.055	(0.452)	0.050	0.006
35	2.92	0.17	0.055	(0.451)	0.050	0.006
36	3.00	0.17	0.055	(0.449)	0.050	0.006
37	3.08	0.17	0.055	(0.447)	0.050	0.006
38	3.17	0.17	0.055	(0.445)	0.050	0.006
39	3.25	0.17	0.055	(0.443)	0.050	0.006
40	3.33	0.17	0.055	(0.441)	0.050	0.006
41	3.42	0.17	0.055	(0.439)	0.050	0.006
42	3.50	0.17	0.055	(0.438)	0.050	0.006
43	3.58	0.17	0.055	(0.436)	0.050	0.006
44	3.67	0.17	0.055	(0.434)	0.050	0.006
45	3.75	0.17	0.055	(0.432)	0.050	0.006

46	3.83	0.20	0.066	(0.430)	0.060	0.007
47	3.92	0.20	0.066	(0.428)	0.060	0.007
48	4.00	0.20	0.066	(0.427)	0.060	0.007
49	4.08	0.20	0.066	(0.425)	0.060	0.007
50	4.17	0.20	0.066	(0.423)	0.060	0.007
51	4.25	0.20	0.066	(0.421)	0.060	0.007
52	4.33	0.23	0.077	(0.419)	0.070	0.008
53	4.42	0.23	0.077	(0.418)	0.070	0.008
54	4.50	0.23	0.077	(0.416)	0.070	0.008
55	4.58	0.23	0.077	(0.414)	0.070	0.008
56	4.67	0.23	0.077	(0.412)	0.070	0.008
57	4.75	0.23	0.077	(0.411)	0.070	0.008
58	4.83	0.27	0.088	(0.409)	0.080	0.009
59	4.92	0.27	0.088	(0.407)	0.080	0.009
60	5.00	0.27	0.088	(0.405)	0.080	0.009
61	5.08	0.20	0.066	(0.403)	0.060	0.007
62	5.17	0.20	0.066	(0.402)	0.060	0.007
63	5.25	0.20	0.066	(0.400)	0.060	0.007
64	5.33	0.23	0.077	(0.398)	0.070	0.008
65	5.42	0.23	0.077	(0.396)	0.070	0.008
66	5.50	0.23	0.077	(0.395)	0.070	0.008
67	5.58	0.27	0.088	(0.393)	0.080	0.009
68	5.67	0.27	0.088	(0.391)	0.080	0.009
69	5.75	0.27	0.088	(0.390)	0.080	0.009
70	5.83	0.27	0.088	(0.388)	0.080	0.009
71	5.92	0.27	0.088	(0.386)	0.080	0.009
72	6.00	0.27	0.088	(0.384)	0.080	0.009
73	6.08	0.30	0.099	(0.383)	0.090	0.010
74	6.17	0.30	0.099	(0.381)	0.090	0.010
75	6.25	0.30	0.099	(0.379)	0.090	0.010
76	6.33	0.30	0.099	(0.378)	0.090	0.010
77	6.42	0.30	0.099	(0.376)	0.090	0.010
78	6.50	0.30	0.099	(0.374)	0.090	0.010
79	6.58	0.33	0.111	(0.373)	0.099	0.011
80	6.67	0.33	0.111	(0.371)	0.099	0.011
81	6.75	0.33	0.111	(0.369)	0.099	0.011
82	6.83	0.33	0.111	(0.368)	0.099	0.011
83	6.92	0.33	0.111	(0.366)	0.099	0.011
84	7.00	0.33	0.111	(0.364)	0.099	0.011
85	7.08	0.33	0.111	(0.363)	0.099	0.011
86	7.17	0.33	0.111	(0.361)	0.099	0.011
87	7.25	0.33	0.111	(0.359)	0.099	0.011
88	7.33	0.37	0.122	(0.358)	0.109	0.012
89	7.42	0.37	0.122	(0.356)	0.109	0.012
90	7.50	0.37	0.122	(0.354)	0.109	0.012
91	7.58	0.40	0.133	(0.353)	0.119	0.013
92	7.67	0.40	0.133	(0.351)	0.119	0.013
93	7.75	0.40	0.133	(0.349)	0.119	0.013
94	7.83	0.43	0.144	(0.348)	0.129	0.014
95	7.92	0.43	0.144	(0.346)	0.129	0.014
96	8.00	0.43	0.144	(0.345)	0.129	0.014
97	8.08	0.50	0.166	(0.343)	0.149	0.017
98	8.17	0.50	0.166	(0.341)	0.149	0.017
99	8.25	0.50	0.166	(0.340)	0.149	0.017
100	8.33	0.50	0.166	(0.338)	0.149	0.017
101	8.42	0.50	0.166	(0.337)	0.149	0.017
102	8.50	0.50	0.166	(0.335)	0.149	0.017
103	8.58	0.53	0.177	(0.334)	0.159	0.018
104	8.67	0.53	0.177	(0.332)	0.159	0.018
105	8.75	0.53	0.177	(0.330)	0.159	0.018
106	8.83	0.57	0.188	(0.329)	0.169	0.019
107	8.92	0.57	0.188	(0.327)	0.169	0.019
108	9.00	0.57	0.188	(0.326)	0.169	0.019
109	9.08	0.63	0.210	(0.324)	0.189	0.021
110	9.17	0.63	0.210	(0.323)	0.189	0.021
111	9.25	0.63	0.210	(0.321)	0.189	0.021
112	9.33	0.67	0.221	(0.320)	0.199	0.022
113	9.42	0.67	0.221	(0.318)	0.199	0.022
114	9.50	0.67	0.221	(0.317)	0.199	0.022
115	9.58	0.70	0.232	(0.315)	0.209	0.023
116	9.67	0.70	0.232	(0.314)	0.209	0.023
117	9.75	0.70	0.232	(0.312)	0.209	0.023

118	9.83	0.73	0.243	(0.310)	0.219	0.024
119	9.92	0.73	0.243	(0.309)	0.219	0.024
120	10.00	0.73	0.243	(0.308)	0.219	0.024
121	10.08	0.50	0.166	(0.306)	0.149	0.017
122	10.17	0.50	0.166	(0.305)	0.149	0.017
123	10.25	0.50	0.166	(0.303)	0.149	0.017
124	10.33	0.50	0.166	(0.302)	0.149	0.017
125	10.42	0.50	0.166	(0.300)	0.149	0.017
126	10.50	0.50	0.166	(0.299)	0.149	0.017
127	10.58	0.67	0.221	(0.297)	0.199	0.022
128	10.67	0.67	0.221	(0.296)	0.199	0.022
129	10.75	0.67	0.221	(0.294)	0.199	0.022
130	10.83	0.67	0.221	(0.293)	0.199	0.022
131	10.92	0.67	0.221	(0.291)	0.199	0.022
132	11.00	0.67	0.221	(0.290)	0.199	0.022
133	11.08	0.63	0.210	(0.289)	0.189	0.021
134	11.17	0.63	0.210	(0.287)	0.189	0.021
135	11.25	0.63	0.210	(0.286)	0.189	0.021
136	11.33	0.63	0.210	(0.284)	0.189	0.021
137	11.42	0.63	0.210	(0.283)	0.189	0.021
138	11.50	0.63	0.210	(0.281)	0.189	0.021
139	11.58	0.57	0.188	(0.280)	0.169	0.019
140	11.67	0.57	0.188	(0.279)	0.169	0.019
141	11.75	0.57	0.188	(0.277)	0.169	0.019
142	11.83	0.60	0.199	(0.276)	0.179	0.020
143	11.92	0.60	0.199	(0.275)	0.179	0.020
144	12.00	0.60	0.199	(0.273)	0.179	0.020
145	12.08	0.83	0.276	(0.272)	0.249	0.028
146	12.17	0.83	0.276	(0.270)	0.249	0.028
147	12.25	0.83	0.276	(0.269)	0.249	0.028
148	12.33	0.87	0.287	(0.268)	0.259	0.029
149	12.42	0.87	0.287	(0.266)	0.259	0.029
150	12.50	0.87	0.287	(0.265)	0.259	0.029
151	12.58	0.93	0.310	0.264 (0.279)		0.046
152	12.67	0.93	0.310	0.262 (0.279)		0.047
153	12.75	0.93	0.310	0.261 (0.279)		0.048
154	12.83	0.97	0.321	0.260 (0.289)		0.061
155	12.92	0.97	0.321	0.258 (0.289)		0.062
156	13.00	0.97	0.321	0.257 (0.289)		0.063
157	13.08	1.13	0.376	0.256 (0.338)		0.120
158	13.17	1.13	0.376	0.255 (0.338)		0.121
159	13.25	1.13	0.376	0.253 (0.338)		0.123
160	13.33	1.13	0.376	0.252 (0.338)		0.124
161	13.42	1.13	0.376	0.251 (0.338)		0.125
162	13.50	1.13	0.376	0.249 (0.338)		0.126
163	13.58	0.77	0.254	(0.248)	0.229	0.025
164	13.67	0.77	0.254	(0.247)	0.229	0.025
165	13.75	0.77	0.254	(0.246)	0.229	0.025
166	13.83	0.77	0.254	(0.244)	0.229	0.025
167	13.92	0.77	0.254	(0.243)	0.229	0.025
168	14.00	0.77	0.254	(0.242)	0.229	0.025
169	14.08	0.90	0.298	0.241 (0.269)		0.058
170	14.17	0.90	0.298	0.239 (0.269)		0.059
171	14.25	0.90	0.298	0.238 (0.269)		0.060
172	14.33	0.87	0.287	0.237 (0.259)		0.050
173	14.42	0.87	0.287	0.236 (0.259)		0.052
174	14.50	0.87	0.287	0.235 (0.259)		0.053
175	14.58	0.87	0.287	0.233 (0.259)		0.054
176	14.67	0.87	0.287	0.232 (0.259)		0.055
177	14.75	0.87	0.287	0.231 (0.259)		0.056
178	14.83	0.83	0.276	0.230 (0.249)		0.047
179	14.92	0.83	0.276	0.229 (0.249)		0.048
180	15.00	0.83	0.276	0.227 (0.249)		0.049
181	15.08	0.80	0.265	0.226 (0.239)		0.039
182	15.17	0.80	0.265	0.225 (0.239)		0.040
183	15.25	0.80	0.265	0.224 (0.239)		0.041
184	15.33	0.77	0.254	0.223 (0.229)		0.031
185	15.42	0.77	0.254	0.222 (0.229)		0.033
186	15.50	0.77	0.254	0.221 (0.229)		0.034
187	15.58	0.63	0.210	(0.219)	0.189	0.021
188	15.67	0.63	0.210	(0.218)	0.189	0.021
189	15.75	0.63	0.210	(0.217)	0.189	0.021

190	15.83	0.63	0.210	(0.216)	0.189	0.021
191	15.92	0.63	0.210	(0.215)	0.189	0.021
192	16.00	0.63	0.210	(0.214)	0.189	0.021
193	16.08	0.13	0.044	(0.213)	0.040	0.004
194	16.17	0.13	0.044	(0.212)	0.040	0.004
195	16.25	0.13	0.044	(0.211)	0.040	0.004
196	16.33	0.13	0.044	(0.210)	0.040	0.004
197	16.42	0.13	0.044	(0.208)	0.040	0.004
198	16.50	0.13	0.044	(0.207)	0.040	0.004
199	16.58	0.10	0.033	(0.206)	0.030	0.003
200	16.67	0.10	0.033	(0.205)	0.030	0.003
201	16.75	0.10	0.033	(0.204)	0.030	0.003
202	16.83	0.10	0.033	(0.203)	0.030	0.003
203	16.92	0.10	0.033	(0.202)	0.030	0.003
204	17.00	0.10	0.033	(0.201)	0.030	0.003
205	17.08	0.17	0.055	(0.200)	0.050	0.006
206	17.17	0.17	0.055	(0.199)	0.050	0.006
207	17.25	0.17	0.055	(0.198)	0.050	0.006
208	17.33	0.17	0.055	(0.197)	0.050	0.006
209	17.42	0.17	0.055	(0.196)	0.050	0.006
210	17.50	0.17	0.055	(0.195)	0.050	0.006
211	17.58	0.17	0.055	(0.194)	0.050	0.006
212	17.67	0.17	0.055	(0.193)	0.050	0.006
213	17.75	0.17	0.055	(0.192)	0.050	0.006
214	17.83	0.13	0.044	(0.191)	0.040	0.004
215	17.92	0.13	0.044	(0.190)	0.040	0.004
216	18.00	0.13	0.044	(0.189)	0.040	0.004
217	18.08	0.13	0.044	(0.188)	0.040	0.004
218	18.17	0.13	0.044	(0.188)	0.040	0.004
219	18.25	0.13	0.044	(0.187)	0.040	0.004
220	18.33	0.13	0.044	(0.186)	0.040	0.004
221	18.42	0.13	0.044	(0.185)	0.040	0.004
222	18.50	0.13	0.044	(0.184)	0.040	0.004
223	18.58	0.10	0.033	(0.183)	0.030	0.003
224	18.67	0.10	0.033	(0.182)	0.030	0.003
225	18.75	0.10	0.033	(0.181)	0.030	0.003
226	18.83	0.07	0.022	(0.180)	0.020	0.002
227	18.92	0.07	0.022	(0.180)	0.020	0.002
228	19.00	0.07	0.022	(0.179)	0.020	0.002
229	19.08	0.10	0.033	(0.178)	0.030	0.003
230	19.17	0.10	0.033	(0.177)	0.030	0.003
231	19.25	0.10	0.033	(0.176)	0.030	0.003
232	19.33	0.13	0.044	(0.175)	0.040	0.004
233	19.42	0.13	0.044	(0.175)	0.040	0.004
234	19.50	0.13	0.044	(0.174)	0.040	0.004
235	19.58	0.10	0.033	(0.173)	0.030	0.003
236	19.67	0.10	0.033	(0.172)	0.030	0.003
237	19.75	0.10	0.033	(0.171)	0.030	0.003
238	19.83	0.07	0.022	(0.171)	0.020	0.002
239	19.92	0.07	0.022	(0.170)	0.020	0.002
240	20.00	0.07	0.022	(0.169)	0.020	0.002
241	20.08	0.10	0.033	(0.168)	0.030	0.003
242	20.17	0.10	0.033	(0.168)	0.030	0.003
243	20.25	0.10	0.033	(0.167)	0.030	0.003
244	20.33	0.10	0.033	(0.166)	0.030	0.003
245	20.42	0.10	0.033	(0.165)	0.030	0.003
246	20.50	0.10	0.033	(0.165)	0.030	0.003
247	20.58	0.10	0.033	(0.164)	0.030	0.003
248	20.67	0.10	0.033	(0.163)	0.030	0.003
249	20.75	0.10	0.033	(0.163)	0.030	0.003
250	20.83	0.07	0.022	(0.162)	0.020	0.002
251	20.92	0.07	0.022	(0.161)	0.020	0.002
252	21.00	0.07	0.022	(0.161)	0.020	0.002
253	21.08	0.10	0.033	(0.160)	0.030	0.003
254	21.17	0.10	0.033	(0.159)	0.030	0.003
255	21.25	0.10	0.033	(0.159)	0.030	0.003
256	21.33	0.07	0.022	(0.158)	0.020	0.002
257	21.42	0.07	0.022	(0.158)	0.020	0.002
258	21.50	0.07	0.022	(0.157)	0.020	0.002
259	21.58	0.10	0.033	(0.156)	0.030	0.003
260	21.67	0.10	0.033	(0.156)	0.030	0.003
261	21.75	0.10	0.033	(0.155)	0.030	0.003

262	21.83	0.07	0.022	(0.155)	0.020	0.002
263	21.92	0.07	0.022	(0.154)	0.020	0.002
264	22.00	0.07	0.022	(0.154)	0.020	0.002
265	22.08	0.10	0.033	(0.153)	0.030	0.003
266	22.17	0.10	0.033	(0.153)	0.030	0.003
267	22.25	0.10	0.033	(0.152)	0.030	0.003
268	22.33	0.07	0.022	(0.152)	0.020	0.002
269	22.42	0.07	0.022	(0.151)	0.020	0.002
270	22.50	0.07	0.022	(0.151)	0.020	0.002
271	22.58	0.07	0.022	(0.150)	0.020	0.002
272	22.67	0.07	0.022	(0.150)	0.020	0.002
273	22.75	0.07	0.022	(0.150)	0.020	0.002
274	22.83	0.07	0.022	(0.149)	0.020	0.002
275	22.92	0.07	0.022	(0.149)	0.020	0.002
276	23.00	0.07	0.022	(0.148)	0.020	0.002
277	23.08	0.07	0.022	(0.148)	0.020	0.002
278	23.17	0.07	0.022	(0.148)	0.020	0.002
279	23.25	0.07	0.022	(0.147)	0.020	0.002
280	23.33	0.07	0.022	(0.147)	0.020	0.002
281	23.42	0.07	0.022	(0.147)	0.020	0.002
282	23.50	0.07	0.022	(0.147)	0.020	0.002
283	23.58	0.07	0.022	(0.146)	0.020	0.002
284	23.67	0.07	0.022	(0.146)	0.020	0.002
285	23.75	0.07	0.022	(0.146)	0.020	0.002
286	23.83	0.07	0.022	(0.146)	0.020	0.002
287	23.92	0.07	0.022	(0.146)	0.020	0.002
288	24.00	0.07	0.022	(0.146)	0.020	0.002

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.3

Flood volume = Effective rainfall 0.36(In)
times area 2.7(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)
Total soil loss = 2.40(In)
Total soil loss = 0.547(Ac.Ft)
Total rainfall = 2.76(In)
Flood volume = 3574.1 Cubic Feet
Total soil loss = 23813.9 Cubic Feet

Peak flow rate of this hydrograph = 0.348(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	0.0001	0.01	Q				
0+15	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0004	0.01	Q				
0+45	0.0005	0.01	Q				
0+50	0.0006	0.01	Q				
0+55	0.0007	0.01	Q				
1+ 0	0.0008	0.01	Q				
1+ 5	0.0008	0.01	Q				
1+10	0.0009	0.01	Q				
1+15	0.0009	0.01	Q				
1+20	0.0010	0.01	Q				
1+25	0.0011	0.01	Q				
1+30	0.0011	0.01	Q				
1+35	0.0012	0.01	Q				
1+40	0.0013	0.01	Q				
1+45	0.0013	0.01	Q				
1+50	0.0014	0.01	Q				
1+55	0.0015	0.01	Q				
2+ 0	0.0016	0.01	Q				

2+ 5	0.0017	0.01	Q
2+10	0.0017	0.01	Q
2+15	0.0018	0.01	Q
2+20	0.0019	0.01	Q
2+25	0.0020	0.01	Q
2+30	0.0021	0.01	QV
2+35	0.0022	0.02	QV
2+40	0.0023	0.02	QV
2+45	0.0024	0.02	QV
2+50	0.0025	0.02	QV
2+55	0.0026	0.02	QV
3+ 0	0.0027	0.02	QV
3+ 5	0.0028	0.02	QV
3+10	0.0029	0.02	QV
3+15	0.0030	0.02	QV
3+20	0.0031	0.02	QV
3+25	0.0032	0.02	QV
3+30	0.0033	0.02	QV
3+35	0.0034	0.02	QV
3+40	0.0035	0.02	QV
3+45	0.0036	0.02	QV
3+50	0.0038	0.02	QV
3+55	0.0039	0.02	QV
4+ 0	0.0040	0.02	QV
4+ 5	0.0041	0.02	Q V
4+10	0.0043	0.02	Q V
4+15	0.0044	0.02	Q V
4+20	0.0045	0.02	Q V
4+25	0.0047	0.02	Q V
4+30	0.0048	0.02	Q V
4+35	0.0050	0.02	Q V
4+40	0.0051	0.02	Q V
4+45	0.0053	0.02	Q V
4+50	0.0054	0.02	Q V
4+55	0.0056	0.02	Q V
5+ 0	0.0058	0.02	Q V
5+ 5	0.0059	0.02	Q V
5+10	0.0060	0.02	Q V
5+15	0.0062	0.02	Q V
5+20	0.0063	0.02	Q V
5+25	0.0065	0.02	Q V
5+30	0.0066	0.02	Q V
5+35	0.0068	0.02	Q V
5+40	0.0069	0.02	Q V
5+45	0.0071	0.02	Q V
5+50	0.0073	0.02	Q V
5+55	0.0074	0.02	Q V
6+ 0	0.0076	0.02	Q V
6+ 5	0.0078	0.03	Q V
6+10	0.0080	0.03	Q V
6+15	0.0082	0.03	Q V
6+20	0.0084	0.03	Q V
6+25	0.0086	0.03	Q V
6+30	0.0087	0.03	Q V
6+35	0.0089	0.03	Q V
6+40	0.0092	0.03	Q V
6+45	0.0094	0.03	Q V
6+50	0.0096	0.03	Q V
6+55	0.0098	0.03	Q V
7+ 0	0.0100	0.03	Q V
7+ 5	0.0102	0.03	Q V
7+10	0.0104	0.03	Q V
7+15	0.0106	0.03	Q V
7+20	0.0109	0.03	Q V
7+25	0.0111	0.03	Q V
7+30	0.0113	0.03	Q V
7+35	0.0116	0.04	Q V
7+40	0.0118	0.04	Q V
7+45	0.0121	0.04	Q V
7+50	0.0123	0.04	Q V
7+55	0.0126	0.04	Q V
8+ 0	0.0129	0.04	Q V

8+ 5	0.0132	0.05	Q	V				
8+10	0.0135	0.05	Q	V				
8+15	0.0138	0.05	Q	V				
8+20	0.0141	0.05	Q	V				
8+25	0.0145	0.05	Q	V				
8+30	0.0148	0.05	Q	V				
8+35	0.0151	0.05	Q	V				
8+40	0.0154	0.05	Q	V				
8+45	0.0158	0.05	Q	V				
8+50	0.0161	0.05	Q	V				
8+55	0.0165	0.05	Q	V				
9+ 0	0.0169	0.05	Q	V				
9+ 5	0.0172	0.06	Q	V				
9+10	0.0176	0.06	Q	V				
9+15	0.0180	0.06	Q	V				
9+20	0.0185	0.06	Q	V				
9+25	0.0189	0.06	Q	V				
9+30	0.0193	0.06	Q	V				
9+35	0.0197	0.06	Q	V				
9+40	0.0202	0.06	Q	V				
9+45	0.0206	0.06	Q	V				
9+50	0.0211	0.07	Q	V				
9+55	0.0215	0.07	Q	V				
10+ 0	0.0220	0.07	Q	V				
10+ 5	0.0223	0.05	Q	V				
10+10	0.0226	0.05	Q	V				
10+15	0.0229	0.05	Q	V				
10+20	0.0233	0.05	Q	V				
10+25	0.0236	0.05	Q	V				
10+30	0.0239	0.05	Q	V				
10+35	0.0243	0.06	Q	V				
10+40	0.0247	0.06	Q	V				
10+45	0.0251	0.06	Q	V				
10+50	0.0256	0.06	Q	V				
10+55	0.0260	0.06	Q	V				
11+ 0	0.0264	0.06	Q	V				
11+ 5	0.0268	0.06	Q	V				
11+10	0.0272	0.06	Q	V				
11+15	0.0276	0.06	Q	V				
11+20	0.0280	0.06	Q	V				
11+25	0.0284	0.06	Q	V				
11+30	0.0288	0.06	Q	V				
11+35	0.0292	0.05	Q	V				
11+40	0.0295	0.05	Q	V				
11+45	0.0299	0.05	Q	V				
11+50	0.0302	0.05	Q	V				
11+55	0.0306	0.05	Q	V				
12+ 0	0.0310	0.05	Q	V				
12+ 5	0.0315	0.08	Q	V				
12+10	0.0320	0.08	Q	V				
12+15	0.0326	0.08	Q	V				
12+20	0.0331	0.08	Q	V				
12+25	0.0337	0.08	Q	V				
12+30	0.0342	0.08	Q	V				
12+35	0.0351	0.13	Q	V				
12+40	0.0360	0.13	Q	V				
12+45	0.0369	0.13	Q	V				
12+50	0.0380	0.17	Q	V				
12+55	0.0392	0.17	Q	V				
13+ 0	0.0404	0.17	Q	V				
13+ 5	0.0427	0.33	Q	V				
13+10	0.0450	0.33	Q	V				
13+15	0.0473	0.34	Q	V				
13+20	0.0497	0.34	Q	V				
13+25	0.0520	0.34	Q	V				
13+30	0.0544	0.35	Q	V				
13+35	0.0549	0.07	Q	V				
13+40	0.0554	0.07	Q	V				
13+45	0.0559	0.07	Q	V				
13+50	0.0564	0.07	Q	V				
13+55	0.0568	0.07	Q	V				
14+ 0	0.0573	0.07	Q	V				

20+ 5	0.0797	0.01	Q				V
20+10	0.0798	0.01	Q				V
20+15	0.0798	0.01	Q				V
20+20	0.0799	0.01	Q				V
20+25	0.0800	0.01	Q				V
20+30	0.0800	0.01	Q				V
20+35	0.0801	0.01	Q				V
20+40	0.0802	0.01	Q				V
20+45	0.0802	0.01	Q				V
20+50	0.0803	0.01	Q				V
20+55	0.0803	0.01	Q				V
21+ 0	0.0804	0.01	Q				V
21+ 5	0.0804	0.01	Q				V
21+10	0.0805	0.01	Q				V
21+15	0.0805	0.01	Q				V
21+20	0.0806	0.01	Q				V
21+25	0.0806	0.01	Q				V
21+30	0.0807	0.01	Q				V
21+35	0.0807	0.01	Q				V
21+40	0.0808	0.01	Q				V
21+45	0.0809	0.01	Q				V
21+50	0.0809	0.01	Q				V
21+55	0.0809	0.01	Q				V
22+ 0	0.0810	0.01	Q				V
22+ 5	0.0810	0.01	Q				V
22+10	0.0811	0.01	Q				V
22+15	0.0812	0.01	Q				V
22+20	0.0812	0.01	Q				V
22+25	0.0813	0.01	Q				V
22+30	0.0813	0.01	Q				V
22+35	0.0813	0.01	Q				V
22+40	0.0814	0.01	Q				V
22+45	0.0814	0.01	Q				V
22+50	0.0815	0.01	Q				V
22+55	0.0815	0.01	Q				V
23+ 0	0.0815	0.01	Q				V
23+ 5	0.0816	0.01	Q				V
23+10	0.0816	0.01	Q				V
23+15	0.0817	0.01	Q				V
23+20	0.0817	0.01	Q				V
23+25	0.0818	0.01	Q				V
23+30	0.0818	0.01	Q				V
23+35	0.0818	0.01	Q				V
23+40	0.0819	0.01	Q				V
23+45	0.0819	0.01	Q				V
23+50	0.0820	0.01	Q				V
23+55	0.0820	0.01	Q				V
24+ 0	0.0820	0.01	Q				V

PROPOSED CONDITION

Unit Hydrograph Analysis

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Study date 01/23/23 File: 4130PE102410.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

SOUTH NANCE TRAILER YARD - PERRIS
PROPOSED CONDITION - EAST
HYDROLOGIC ANALYSIS - 10-YEAR

Drainage Area = 2.73(Ac.) = 0.004 Sq. Mi.
Drainage Area for Depth-Area Areal Adj. = 2.73(Ac.) = 0.004 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.000 Hr.
Lag time = 0.00 Min.
25% of lag time = 0.00 Min.
40% of lag time = 0.00 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.73	1.62	4.42

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
2.73	4.40	12.01

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.620(In)
Area Averaged 100-Year Rainfall = 4.400(In)

Point rain (area averaged) = 2.764(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.764(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.730	56.00	0.900
Total Area Entered = 2.73(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097

Sum (F) = 0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
 Minimum soil loss rate ((In/Hr)) = 0.049
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.180

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	1.#IO	100.000	2.751
	Sum =	100.000	Sum= 2.751

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	0.022	(0.172)	0.004	0.018
2	0.17	0.07	0.022	(0.171)	0.004	0.018
3	0.25	0.07	0.022	(0.171)	0.004	0.018
4	0.33	0.10	0.033	(0.170)	0.006	0.027
5	0.42	0.10	0.033	(0.169)	0.006	0.027
6	0.50	0.10	0.033	(0.169)	0.006	0.027
7	0.58	0.10	0.033	(0.168)	0.006	0.027
8	0.67	0.10	0.033	(0.167)	0.006	0.027
9	0.75	0.10	0.033	(0.167)	0.006	0.027
10	0.83	0.13	0.044	(0.166)	0.008	0.036
11	0.92	0.13	0.044	(0.165)	0.008	0.036
12	1.00	0.13	0.044	(0.165)	0.008	0.036
13	1.08	0.10	0.033	(0.164)	0.006	0.027
14	1.17	0.10	0.033	(0.163)	0.006	0.027
15	1.25	0.10	0.033	(0.163)	0.006	0.027
16	1.33	0.10	0.033	(0.162)	0.006	0.027
17	1.42	0.10	0.033	(0.162)	0.006	0.027
18	1.50	0.10	0.033	(0.161)	0.006	0.027
19	1.58	0.10	0.033	(0.160)	0.006	0.027
20	1.67	0.10	0.033	(0.160)	0.006	0.027
21	1.75	0.10	0.033	(0.159)	0.006	0.027
22	1.83	0.13	0.044	(0.158)	0.008	0.036
23	1.92	0.13	0.044	(0.158)	0.008	0.036
24	2.00	0.13	0.044	(0.157)	0.008	0.036
25	2.08	0.13	0.044	(0.156)	0.008	0.036
26	2.17	0.13	0.044	(0.156)	0.008	0.036
27	2.25	0.13	0.044	(0.155)	0.008	0.036
28	2.33	0.13	0.044	(0.155)	0.008	0.036
29	2.42	0.13	0.044	(0.154)	0.008	0.036
30	2.50	0.13	0.044	(0.153)	0.008	0.036
31	2.58	0.17	0.055	(0.153)	0.010	0.045
32	2.67	0.17	0.055	(0.152)	0.010	0.045
33	2.75	0.17	0.055	(0.151)	0.010	0.045
34	2.83	0.17	0.055	(0.151)	0.010	0.045
35	2.92	0.17	0.055	(0.150)	0.010	0.045
36	3.00	0.17	0.055	(0.150)	0.010	0.045
37	3.08	0.17	0.055	(0.149)	0.010	0.045
38	3.17	0.17	0.055	(0.148)	0.010	0.045
39	3.25	0.17	0.055	(0.148)	0.010	0.045
40	3.33	0.17	0.055	(0.147)	0.010	0.045
41	3.42	0.17	0.055	(0.146)	0.010	0.045
42	3.50	0.17	0.055	(0.146)	0.010	0.045
43	3.58	0.17	0.055	(0.145)	0.010	0.045
44	3.67	0.17	0.055	(0.145)	0.010	0.045
45	3.75	0.17	0.055	(0.144)	0.010	0.045

46	3.83	0.20	0.066	(0.143)	0.012	0.054
47	3.92	0.20	0.066	(0.143)	0.012	0.054
48	4.00	0.20	0.066	(0.142)	0.012	0.054
49	4.08	0.20	0.066	(0.142)	0.012	0.054
50	4.17	0.20	0.066	(0.141)	0.012	0.054
51	4.25	0.20	0.066	(0.140)	0.012	0.054
52	4.33	0.23	0.077	(0.140)	0.014	0.063
53	4.42	0.23	0.077	(0.139)	0.014	0.063
54	4.50	0.23	0.077	(0.139)	0.014	0.063
55	4.58	0.23	0.077	(0.138)	0.014	0.063
56	4.67	0.23	0.077	(0.137)	0.014	0.063
57	4.75	0.23	0.077	(0.137)	0.014	0.063
58	4.83	0.27	0.088	(0.136)	0.016	0.073
59	4.92	0.27	0.088	(0.136)	0.016	0.073
60	5.00	0.27	0.088	(0.135)	0.016	0.073
61	5.08	0.20	0.066	(0.134)	0.012	0.054
62	5.17	0.20	0.066	(0.134)	0.012	0.054
63	5.25	0.20	0.066	(0.133)	0.012	0.054
64	5.33	0.23	0.077	(0.133)	0.014	0.063
65	5.42	0.23	0.077	(0.132)	0.014	0.063
66	5.50	0.23	0.077	(0.132)	0.014	0.063
67	5.58	0.27	0.088	(0.131)	0.016	0.073
68	5.67	0.27	0.088	(0.130)	0.016	0.073
69	5.75	0.27	0.088	(0.130)	0.016	0.073
70	5.83	0.27	0.088	(0.129)	0.016	0.073
71	5.92	0.27	0.088	(0.129)	0.016	0.073
72	6.00	0.27	0.088	(0.128)	0.016	0.073
73	6.08	0.30	0.099	(0.128)	0.018	0.082
74	6.17	0.30	0.099	(0.127)	0.018	0.082
75	6.25	0.30	0.099	(0.126)	0.018	0.082
76	6.33	0.30	0.099	(0.126)	0.018	0.082
77	6.42	0.30	0.099	(0.125)	0.018	0.082
78	6.50	0.30	0.099	(0.125)	0.018	0.082
79	6.58	0.33	0.111	(0.124)	0.020	0.091
80	6.67	0.33	0.111	(0.124)	0.020	0.091
81	6.75	0.33	0.111	(0.123)	0.020	0.091
82	6.83	0.33	0.111	(0.122)	0.020	0.091
83	6.92	0.33	0.111	(0.122)	0.020	0.091
84	7.00	0.33	0.111	(0.121)	0.020	0.091
85	7.08	0.33	0.111	(0.121)	0.020	0.091
86	7.17	0.33	0.111	(0.120)	0.020	0.091
87	7.25	0.33	0.111	(0.120)	0.020	0.091
88	7.33	0.37	0.122	(0.119)	0.022	0.100
89	7.42	0.37	0.122	(0.119)	0.022	0.100
90	7.50	0.37	0.122	(0.118)	0.022	0.100
91	7.58	0.40	0.133	(0.118)	0.024	0.109
92	7.67	0.40	0.133	(0.117)	0.024	0.109
93	7.75	0.40	0.133	(0.116)	0.024	0.109
94	7.83	0.43	0.144	(0.116)	0.026	0.118
95	7.92	0.43	0.144	(0.115)	0.026	0.118
96	8.00	0.43	0.144	(0.115)	0.026	0.118
97	8.08	0.50	0.166	(0.114)	0.030	0.136
98	8.17	0.50	0.166	(0.114)	0.030	0.136
99	8.25	0.50	0.166	(0.113)	0.030	0.136
100	8.33	0.50	0.166	(0.113)	0.030	0.136
101	8.42	0.50	0.166	(0.112)	0.030	0.136
102	8.50	0.50	0.166	(0.112)	0.030	0.136
103	8.58	0.53	0.177	(0.111)	0.032	0.145
104	8.67	0.53	0.177	(0.111)	0.032	0.145
105	8.75	0.53	0.177	(0.110)	0.032	0.145
106	8.83	0.57	0.188	(0.110)	0.034	0.154
107	8.92	0.57	0.188	(0.109)	0.034	0.154
108	9.00	0.57	0.188	(0.109)	0.034	0.154
109	9.08	0.63	0.210	(0.108)	0.038	0.172
110	9.17	0.63	0.210	(0.108)	0.038	0.172
111	9.25	0.63	0.210	(0.107)	0.038	0.172
112	9.33	0.67	0.221	(0.107)	0.040	0.181
113	9.42	0.67	0.221	(0.106)	0.040	0.181
114	9.50	0.67	0.221	(0.105)	0.040	0.181
115	9.58	0.70	0.232	(0.105)	0.042	0.190
116	9.67	0.70	0.232	(0.104)	0.042	0.190
117	9.75	0.70	0.232	(0.104)	0.042	0.190

118	9.83	0.73	0.243	(0.103)	0.044	0.199
119	9.92	0.73	0.243	(0.103)	0.044	0.199
120	10.00	0.73	0.243	(0.102)	0.044	0.199
121	10.08	0.50	0.166	(0.102)	0.030	0.136
122	10.17	0.50	0.166	(0.101)	0.030	0.136
123	10.25	0.50	0.166	(0.101)	0.030	0.136
124	10.33	0.50	0.166	(0.101)	0.030	0.136
125	10.42	0.50	0.166	(0.100)	0.030	0.136
126	10.50	0.50	0.166	(0.100)	0.030	0.136
127	10.58	0.67	0.221	(0.099)	0.040	0.181
128	10.67	0.67	0.221	(0.099)	0.040	0.181
129	10.75	0.67	0.221	(0.098)	0.040	0.181
130	10.83	0.67	0.221	(0.098)	0.040	0.181
131	10.92	0.67	0.221	(0.097)	0.040	0.181
132	11.00	0.67	0.221	(0.097)	0.040	0.181
133	11.08	0.63	0.210	(0.096)	0.038	0.172
134	11.17	0.63	0.210	(0.096)	0.038	0.172
135	11.25	0.63	0.210	(0.095)	0.038	0.172
136	11.33	0.63	0.210	(0.095)	0.038	0.172
137	11.42	0.63	0.210	(0.094)	0.038	0.172
138	11.50	0.63	0.210	(0.094)	0.038	0.172
139	11.58	0.57	0.188	(0.093)	0.034	0.154
140	11.67	0.57	0.188	(0.093)	0.034	0.154
141	11.75	0.57	0.188	(0.092)	0.034	0.154
142	11.83	0.60	0.199	(0.092)	0.036	0.163
143	11.92	0.60	0.199	(0.092)	0.036	0.163
144	12.00	0.60	0.199	(0.091)	0.036	0.163
145	12.08	0.83	0.276	(0.091)	0.050	0.227
146	12.17	0.83	0.276	(0.090)	0.050	0.227
147	12.25	0.83	0.276	(0.090)	0.050	0.227
148	12.33	0.87	0.287	(0.089)	0.052	0.236
149	12.42	0.87	0.287	(0.089)	0.052	0.236
150	12.50	0.87	0.287	(0.088)	0.052	0.236
151	12.58	0.93	0.310	(0.088)	0.056	0.254
152	12.67	0.93	0.310	(0.087)	0.056	0.254
153	12.75	0.93	0.310	(0.087)	0.056	0.254
154	12.83	0.97	0.321	(0.087)	0.058	0.263
155	12.92	0.97	0.321	(0.086)	0.058	0.263
156	13.00	0.97	0.321	(0.086)	0.058	0.263
157	13.08	1.13	0.376	(0.085)	0.068	0.308
158	13.17	1.13	0.376	(0.085)	0.068	0.308
159	13.25	1.13	0.376	(0.084)	0.068	0.308
160	13.33	1.13	0.376	(0.084)	0.068	0.308
161	13.42	1.13	0.376	(0.084)	0.068	0.308
162	13.50	1.13	0.376	(0.083)	0.068	0.308
163	13.58	0.77	0.254	(0.083)	0.046	0.208
164	13.67	0.77	0.254	(0.082)	0.046	0.208
165	13.75	0.77	0.254	(0.082)	0.046	0.208
166	13.83	0.77	0.254	(0.081)	0.046	0.208
167	13.92	0.77	0.254	(0.081)	0.046	0.208
168	14.00	0.77	0.254	(0.081)	0.046	0.208
169	14.08	0.90	0.298	(0.080)	0.054	0.245
170	14.17	0.90	0.298	(0.080)	0.054	0.245
171	14.25	0.90	0.298	(0.079)	0.054	0.245
172	14.33	0.87	0.287	(0.079)	0.052	0.236
173	14.42	0.87	0.287	(0.079)	0.052	0.236
174	14.50	0.87	0.287	(0.078)	0.052	0.236
175	14.58	0.87	0.287	(0.078)	0.052	0.236
176	14.67	0.87	0.287	(0.077)	0.052	0.236
177	14.75	0.87	0.287	(0.077)	0.052	0.236
178	14.83	0.83	0.276	(0.077)	0.050	0.227
179	14.92	0.83	0.276	(0.076)	0.050	0.227
180	15.00	0.83	0.276	(0.076)	0.050	0.227
181	15.08	0.80	0.265	(0.075)	0.048	0.218
182	15.17	0.80	0.265	(0.075)	0.048	0.218
183	15.25	0.80	0.265	(0.075)	0.048	0.218
184	15.33	0.77	0.254	(0.074)	0.046	0.208
185	15.42	0.77	0.254	(0.074)	0.046	0.208
186	15.50	0.77	0.254	(0.073)	0.046	0.208
187	15.58	0.63	0.210	(0.073)	0.038	0.172
188	15.67	0.63	0.210	(0.073)	0.038	0.172
189	15.75	0.63	0.210	(0.072)	0.038	0.172

190	15.83	0.63	0.210	(0.072)	0.038	0.172
191	15.92	0.63	0.210	(0.072)	0.038	0.172
192	16.00	0.63	0.210	(0.071)	0.038	0.172
193	16.08	0.13	0.044	(0.071)	0.008	0.036
194	16.17	0.13	0.044	(0.071)	0.008	0.036
195	16.25	0.13	0.044	(0.070)	0.008	0.036
196	16.33	0.13	0.044	(0.070)	0.008	0.036
197	16.42	0.13	0.044	(0.069)	0.008	0.036
198	16.50	0.13	0.044	(0.069)	0.008	0.036
199	16.58	0.10	0.033	(0.069)	0.006	0.027
200	16.67	0.10	0.033	(0.068)	0.006	0.027
201	16.75	0.10	0.033	(0.068)	0.006	0.027
202	16.83	0.10	0.033	(0.068)	0.006	0.027
203	16.92	0.10	0.033	(0.067)	0.006	0.027
204	17.00	0.10	0.033	(0.067)	0.006	0.027
205	17.08	0.17	0.055	(0.067)	0.010	0.045
206	17.17	0.17	0.055	(0.066)	0.010	0.045
207	17.25	0.17	0.055	(0.066)	0.010	0.045
208	17.33	0.17	0.055	(0.066)	0.010	0.045
209	17.42	0.17	0.055	(0.065)	0.010	0.045
210	17.50	0.17	0.055	(0.065)	0.010	0.045
211	17.58	0.17	0.055	(0.065)	0.010	0.045
212	17.67	0.17	0.055	(0.064)	0.010	0.045
213	17.75	0.17	0.055	(0.064)	0.010	0.045
214	17.83	0.13	0.044	(0.064)	0.008	0.036
215	17.92	0.13	0.044	(0.063)	0.008	0.036
216	18.00	0.13	0.044	(0.063)	0.008	0.036
217	18.08	0.13	0.044	(0.063)	0.008	0.036
218	18.17	0.13	0.044	(0.063)	0.008	0.036
219	18.25	0.13	0.044	(0.062)	0.008	0.036
220	18.33	0.13	0.044	(0.062)	0.008	0.036
221	18.42	0.13	0.044	(0.062)	0.008	0.036
222	18.50	0.13	0.044	(0.061)	0.008	0.036
223	18.58	0.10	0.033	(0.061)	0.006	0.027
224	18.67	0.10	0.033	(0.061)	0.006	0.027
225	18.75	0.10	0.033	(0.060)	0.006	0.027
226	18.83	0.07	0.022	(0.060)	0.004	0.018
227	18.92	0.07	0.022	(0.060)	0.004	0.018
228	19.00	0.07	0.022	(0.060)	0.004	0.018
229	19.08	0.10	0.033	(0.059)	0.006	0.027
230	19.17	0.10	0.033	(0.059)	0.006	0.027
231	19.25	0.10	0.033	(0.059)	0.006	0.027
232	19.33	0.13	0.044	(0.058)	0.008	0.036
233	19.42	0.13	0.044	(0.058)	0.008	0.036
234	19.50	0.13	0.044	(0.058)	0.008	0.036
235	19.58	0.10	0.033	(0.058)	0.006	0.027
236	19.67	0.10	0.033	(0.057)	0.006	0.027
237	19.75	0.10	0.033	(0.057)	0.006	0.027
238	19.83	0.07	0.022	(0.057)	0.004	0.018
239	19.92	0.07	0.022	(0.057)	0.004	0.018
240	20.00	0.07	0.022	(0.056)	0.004	0.018
241	20.08	0.10	0.033	(0.056)	0.006	0.027
242	20.17	0.10	0.033	(0.056)	0.006	0.027
243	20.25	0.10	0.033	(0.056)	0.006	0.027
244	20.33	0.10	0.033	(0.055)	0.006	0.027
245	20.42	0.10	0.033	(0.055)	0.006	0.027
246	20.50	0.10	0.033	(0.055)	0.006	0.027
247	20.58	0.10	0.033	(0.055)	0.006	0.027
248	20.67	0.10	0.033	(0.054)	0.006	0.027
249	20.75	0.10	0.033	(0.054)	0.006	0.027
250	20.83	0.07	0.022	(0.054)	0.004	0.018
251	20.92	0.07	0.022	(0.054)	0.004	0.018
252	21.00	0.07	0.022	(0.054)	0.004	0.018
253	21.08	0.10	0.033	(0.053)	0.006	0.027
254	21.17	0.10	0.033	(0.053)	0.006	0.027
255	21.25	0.10	0.033	(0.053)	0.006	0.027
256	21.33	0.07	0.022	(0.053)	0.004	0.018
257	21.42	0.07	0.022	(0.053)	0.004	0.018
258	21.50	0.07	0.022	(0.052)	0.004	0.018
259	21.58	0.10	0.033	(0.052)	0.006	0.027
260	21.67	0.10	0.033	(0.052)	0.006	0.027
261	21.75	0.10	0.033	(0.052)	0.006	0.027

262	21.83	0.07	0.022	(0.052)	0.004	0.018
263	21.92	0.07	0.022	(0.051)	0.004	0.018
264	22.00	0.07	0.022	(0.051)	0.004	0.018
265	22.08	0.10	0.033	(0.051)	0.006	0.027
266	22.17	0.10	0.033	(0.051)	0.006	0.027
267	22.25	0.10	0.033	(0.051)	0.006	0.027
268	22.33	0.07	0.022	(0.051)	0.004	0.018
269	22.42	0.07	0.022	(0.050)	0.004	0.018
270	22.50	0.07	0.022	(0.050)	0.004	0.018
271	22.58	0.07	0.022	(0.050)	0.004	0.018
272	22.67	0.07	0.022	(0.050)	0.004	0.018
273	22.75	0.07	0.022	(0.050)	0.004	0.018
274	22.83	0.07	0.022	(0.050)	0.004	0.018
275	22.92	0.07	0.022	(0.050)	0.004	0.018
276	23.00	0.07	0.022	(0.049)	0.004	0.018
277	23.08	0.07	0.022	(0.049)	0.004	0.018
278	23.17	0.07	0.022	(0.049)	0.004	0.018
279	23.25	0.07	0.022	(0.049)	0.004	0.018
280	23.33	0.07	0.022	(0.049)	0.004	0.018
281	23.42	0.07	0.022	(0.049)	0.004	0.018
282	23.50	0.07	0.022	(0.049)	0.004	0.018
283	23.58	0.07	0.022	(0.049)	0.004	0.018
284	23.67	0.07	0.022	(0.049)	0.004	0.018
285	23.75	0.07	0.022	(0.049)	0.004	0.018
286	23.83	0.07	0.022	(0.049)	0.004	0.018
287	23.92	0.07	0.022	(0.049)	0.004	0.018
288	24.00	0.07	0.022	(0.049)	0.004	0.018

(Loss Rate Not Used)

Sum = 100.0 Sum = 27.2

Flood volume = Effective rainfall 2.27(In)
times area 2.7(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 0.50(In)
Total soil loss = 0.113(Ac.Ft)
Total rainfall = 2.76(In)
Flood volume = 22458.2 Cubic Feet
Total soil loss = 4929.8 Cubic Feet

Peak flow rate of this hydrograph = 0.848(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	0.0003	0.05	Q				
0+10	0.0007	0.05	Q				
0+15	0.0010	0.05	Q				
0+20	0.0015	0.07	Q				
0+25	0.0021	0.07	Q				
0+30	0.0026	0.07	Q				
0+35	0.0031	0.07	Q				
0+40	0.0036	0.07	Q				
0+45	0.0041	0.07	Q				
0+50	0.0048	0.10	Q				
0+55	0.0055	0.10	Q				
1+ 0	0.0062	0.10	Q				
1+ 5	0.0067	0.07	Q				
1+10	0.0072	0.07	Q				
1+15	0.0077	0.07	Q				
1+20	0.0082	0.07	Q				
1+25	0.0088	0.07	Q				
1+30	0.0093	0.07	Q				
1+35	0.0098	0.07	Q				
1+40	0.0103	0.07	Q				
1+45	0.0108	0.07	Q				
1+50	0.0115	0.10	Q				
1+55	0.0122	0.10	Q				
2+ 0	0.0129	0.10	Q				

2+ 5	0.0136	0.10	QV
2+10	0.0143	0.10	QV
2+15	0.0150	0.10	QV
2+20	0.0156	0.10	QV
2+25	0.0163	0.10	QV
2+30	0.0170	0.10	QV
2+35	0.0179	0.12	QV
2+40	0.0187	0.12	QV
2+45	0.0196	0.12	QV
2+50	0.0205	0.12	QV
2+55	0.0213	0.12	QV
3+ 0	0.0222	0.12	QV
3+ 5	0.0230	0.12	QV
3+10	0.0239	0.12	QV
3+15	0.0247	0.12	QV
3+20	0.0256	0.12	QV
3+25	0.0265	0.12	Q V
3+30	0.0273	0.12	Q V
3+35	0.0282	0.12	Q V
3+40	0.0290	0.12	Q V
3+45	0.0299	0.12	Q V
3+50	0.0309	0.15	Q V
3+55	0.0320	0.15	Q V
4+ 0	0.0330	0.15	Q V
4+ 5	0.0340	0.15	Q V
4+10	0.0351	0.15	Q V
4+15	0.0361	0.15	Q V
4+20	0.0373	0.17	Q V
4+25	0.0385	0.17	Q V
4+30	0.0397	0.17	Q V
4+35	0.0409	0.17	Q V
4+40	0.0421	0.17	Q V
4+45	0.0433	0.17	Q V
4+50	0.0447	0.20	Q V
4+55	0.0461	0.20	Q V
5+ 0	0.0474	0.20	Q V
5+ 5	0.0485	0.15	Q V
5+10	0.0495	0.15	Q V
5+15	0.0505	0.15	Q V
5+20	0.0517	0.17	Q V
5+25	0.0529	0.17	Q V
5+30	0.0541	0.17	Q V
5+35	0.0555	0.20	Q V
5+40	0.0569	0.20	Q V
5+45	0.0583	0.20	Q V
5+50	0.0596	0.20	Q V
5+55	0.0610	0.20	Q V
6+ 0	0.0624	0.20	Q V
6+ 5	0.0639	0.22	Q V
6+10	0.0655	0.22	Q V
6+15	0.0670	0.22	Q V
6+20	0.0686	0.22	Q V
6+25	0.0701	0.22	Q V
6+30	0.0717	0.22	Q V
6+35	0.0734	0.25	Q V
6+40	0.0751	0.25	Q V
6+45	0.0768	0.25	Q V
6+50	0.0785	0.25	Q V
6+55	0.0803	0.25	Q V
7+ 0	0.0820	0.25	Q V
7+ 5	0.0837	0.25	Q V
7+10	0.0854	0.25	Q V
7+15	0.0871	0.25	Q V
7+20	0.0890	0.27	Q V
7+25	0.0909	0.27	Q V
7+30	0.0928	0.27	Q V
7+35	0.0949	0.30	Q V
7+40	0.0969	0.30	Q V
7+45	0.0990	0.30	Q V
7+50	0.1012	0.32	Q V
7+55	0.1035	0.32	Q V
8+ 0	0.1057	0.32	Q V

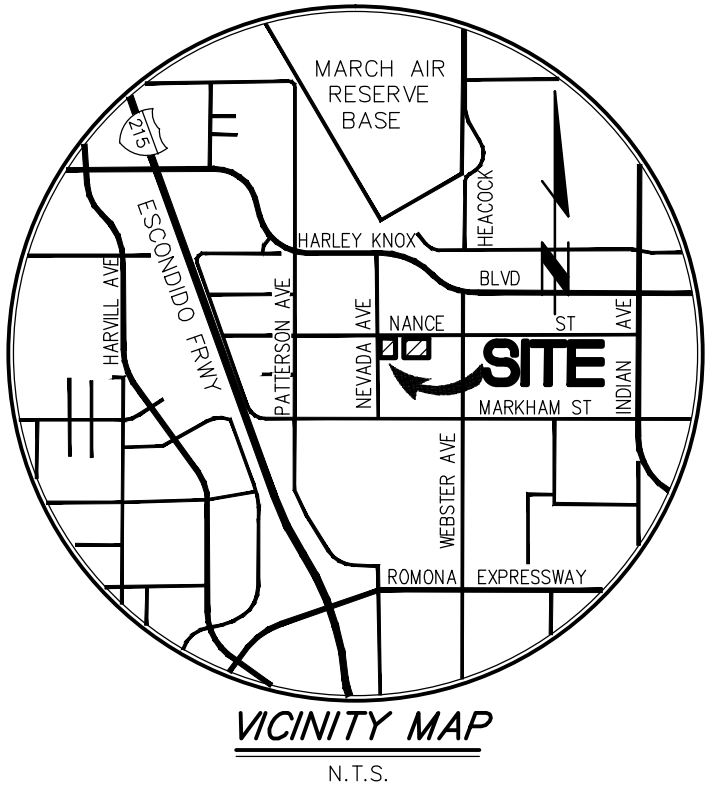
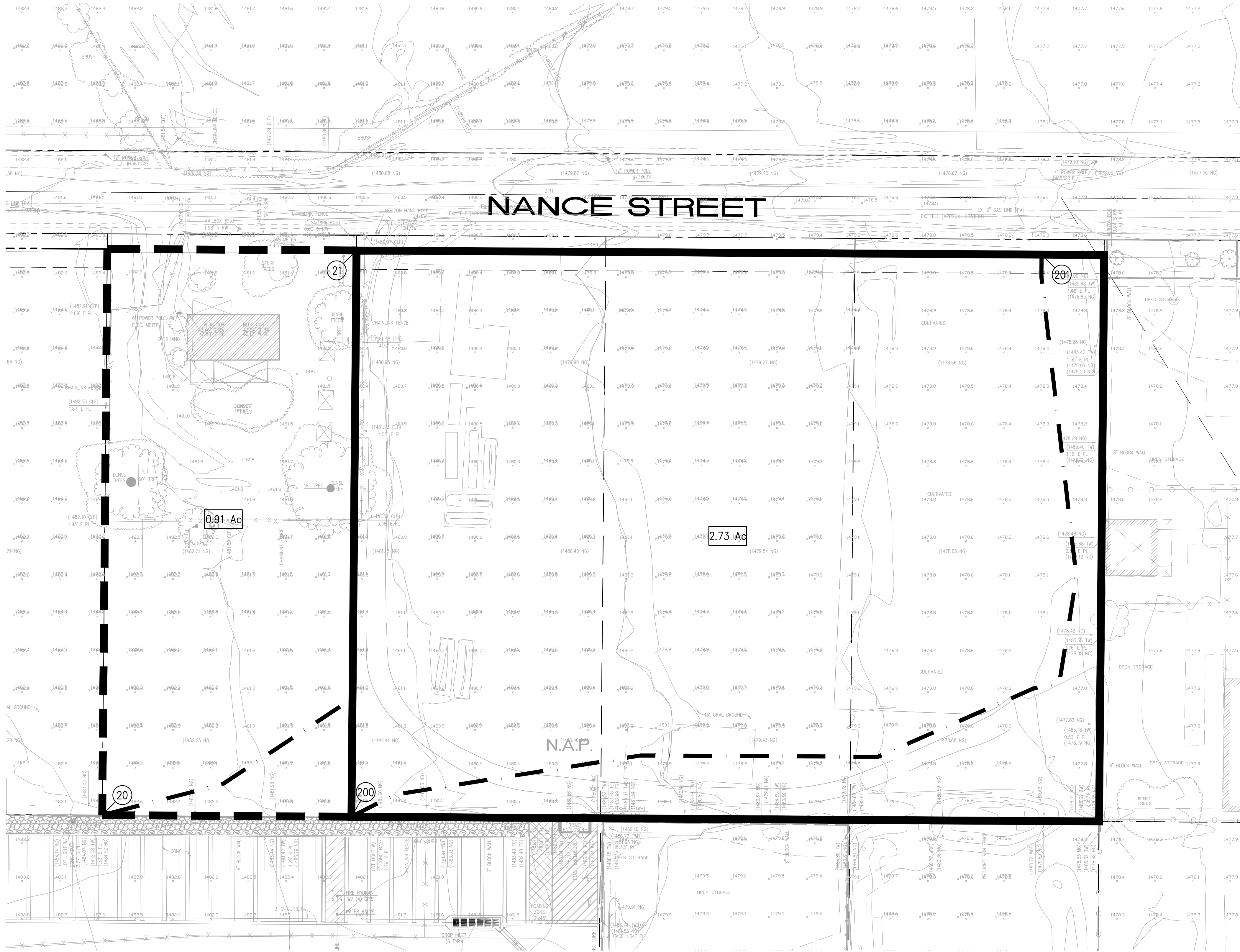
8+ 5	0.1083	0.37	Q	V				
8+10	0.1108	0.37	Q	V				
8+15	0.1134	0.37	Q	V				
8+20	0.1160	0.37	Q	V				
8+25	0.1186	0.37	Q	V				
8+30	0.1212	0.37	Q	V				
8+35	0.1239	0.40	Q	V				
8+40	0.1267	0.40	Q	V				
8+45	0.1294	0.40	Q	V				
8+50	0.1323	0.42	Q	V				
8+55	0.1353	0.42	Q	V				
9+ 0	0.1382	0.42	Q	V				
9+ 5	0.1414	0.47	Q	V				
9+10	0.1447	0.47	Q	V				
9+15	0.1480	0.47	Q	V				
9+20	0.1514	0.50	Q	V				
9+25	0.1548	0.50	Q	V				
9+30	0.1583	0.50	Q	V				
9+35	0.1619	0.52	Q	V				
9+40	0.1655	0.52	Q	V				
9+45	0.1691	0.52	Q	V				
9+50	0.1729	0.55	Q	V				
9+55	0.1767	0.55	Q	V				
10+ 0	0.1804	0.55	Q	V				
10+ 5	0.1830	0.37	Q	V				
10+10	0.1856	0.37	Q	V				
10+15	0.1882	0.37	Q	V				
10+20	0.1908	0.37	Q	V				
10+25	0.1933	0.37	Q	V				
10+30	0.1959	0.37	Q	V				
10+35	0.1994	0.50	Q	V				
10+40	0.2028	0.50	Q	V				
10+45	0.2062	0.50	Q	V				
10+50	0.2097	0.50	Q	V				
10+55	0.2131	0.50	Q	V				
11+ 0	0.2165	0.50	Q	V				
11+ 5	0.2198	0.47	Q	V				
11+10	0.2231	0.47	Q	V				
11+15	0.2263	0.47	Q	V				
11+20	0.2296	0.47	Q	V				
11+25	0.2329	0.47	Q	V				
11+30	0.2361	0.47	Q	V				
11+35	0.2391	0.42	Q	V				
11+40	0.2420	0.42	Q	V				
11+45	0.2449	0.42	Q	V				
11+50	0.2480	0.45	Q	V				
11+55	0.2511	0.45	Q	V				
12+ 0	0.2542	0.45	Q	V				
12+ 5	0.2585	0.62	Q	V				
12+10	0.2628	0.62	Q	V				
12+15	0.2671	0.62	Q	V				
12+20	0.2715	0.65	Q	V				
12+25	0.2760	0.65	Q	V				
12+30	0.2805	0.65	Q	V				
12+35	0.2853	0.70	Q	V				
12+40	0.2901	0.70	Q	V				
12+45	0.2949	0.70	Q	V				
12+50	0.2999	0.72	Q	V				
12+55	0.3049	0.72	Q	V				
13+ 0	0.3099	0.72	Q	V				
13+ 5	0.3157	0.85	Q	V				
13+10	0.3215	0.85	Q	V				
13+15	0.3274	0.85	Q	V				
13+20	0.3332	0.85	Q	V				
13+25	0.3391	0.85	Q	V				
13+30	0.3449	0.85	Q	V				
13+35	0.3489	0.57	Q	V				
13+40	0.3528	0.57	Q	V				
13+45	0.3568	0.57	Q	V				
13+50	0.3607	0.57	Q	V				
13+55	0.3647	0.57	Q	V				
14+ 0	0.3686	0.57	Q	V				

14+ 5	0.3733	0.67	Q			V
14+10	0.3779	0.67	Q			V
14+15	0.3826	0.67	Q			V
14+20	0.3870	0.65	Q			V
14+25	0.3915	0.65	Q			V
14+30	0.3960	0.65	Q			V
14+35	0.4004	0.65	Q			V
14+40	0.4049	0.65	Q			V
14+45	0.4094	0.65	Q			V
14+50	0.4137	0.62	Q			V
14+55	0.4180	0.62	Q			V
15+ 0	0.4223	0.62	Q			V
15+ 5	0.4264	0.60	Q			V
15+10	0.4305	0.60	Q			V
15+15	0.4346	0.60	Q			V
15+20	0.4386	0.57	Q			V
15+25	0.4425	0.57	Q			V
15+30	0.4465	0.57	Q			V
15+35	0.4497	0.47	Q			V
15+40	0.4530	0.47	Q			V
15+45	0.4563	0.47	Q			V
15+50	0.4595	0.47	Q			V
15+55	0.4628	0.47	Q			V
16+ 0	0.4661	0.47	Q			V
16+ 5	0.4668	0.10	Q			V
16+10	0.4674	0.10	Q			V
16+15	0.4681	0.10	Q			V
16+20	0.4688	0.10	Q			V
16+25	0.4695	0.10	Q			V
16+30	0.4702	0.10	Q			V
16+35	0.4707	0.07	Q			V
16+40	0.4712	0.07	Q			V
16+45	0.4717	0.07	Q			V
16+50	0.4723	0.07	Q			V
16+55	0.4728	0.07	Q			V
17+ 0	0.4733	0.07	Q			V
17+ 5	0.4742	0.12	Q			V
17+10	0.4750	0.12	Q			V
17+15	0.4759	0.12	Q			V
17+20	0.4767	0.12	Q			V
17+25	0.4776	0.12	Q			V
17+30	0.4784	0.12	Q			V
17+35	0.4793	0.12	Q			V
17+40	0.4802	0.12	Q			V
17+45	0.4810	0.12	Q			V
17+50	0.4817	0.10	Q			V
17+55	0.4824	0.10	Q			V
18+ 0	0.4831	0.10	Q			V
18+ 5	0.4838	0.10	Q			V
18+10	0.4845	0.10	Q			V
18+15	0.4851	0.10	Q			V
18+20	0.4858	0.10	Q			V
18+25	0.4865	0.10	Q			V
18+30	0.4872	0.10	Q			V
18+35	0.4877	0.07	Q			V
18+40	0.4882	0.07	Q			V
18+45	0.4888	0.07	Q			V
18+50	0.4891	0.05	Q			V
18+55	0.4894	0.05	Q			V
19+ 0	0.4898	0.05	Q			V
19+ 5	0.4903	0.07	Q			V
19+10	0.4908	0.07	Q			V
19+15	0.4913	0.07	Q			V
19+20	0.4920	0.10	Q			V
19+25	0.4927	0.10	Q			V
19+30	0.4934	0.10	Q			V
19+35	0.4939	0.07	Q			V
19+40	0.4944	0.07	Q			V
19+45	0.4949	0.07	Q			V
19+50	0.4953	0.05	Q			V
19+55	0.4956	0.05	Q			V
20+ 0	0.4960	0.05	Q			V

20+ 5	0.4965	0.07	Q				V
20+10	0.4970	0.07	Q				V
20+15	0.4975	0.07	Q				V
20+20	0.4980	0.07	Q				V
20+25	0.4986	0.07	Q				V
20+30	0.4991	0.07	Q				V
20+35	0.4996	0.07	Q				V
20+40	0.5001	0.07	Q				V
20+45	0.5006	0.07	Q				V
20+50	0.5010	0.05	Q				V
20+55	0.5013	0.05	Q				V
21+ 0	0.5016	0.05	Q				V
21+ 5	0.5022	0.07	Q				V
21+10	0.5027	0.07	Q				V
21+15	0.5032	0.07	Q				V
21+20	0.5035	0.05	Q				V
21+25	0.5039	0.05	Q				V
21+30	0.5042	0.05	Q				V
21+35	0.5047	0.07	Q				V
21+40	0.5053	0.07	Q				V
21+45	0.5058	0.07	Q				V
21+50	0.5061	0.05	Q				V
21+55	0.5065	0.05	Q				V
22+ 0	0.5068	0.05	Q				V
22+ 5	0.5073	0.07	Q				V
22+10	0.5078	0.07	Q				V
22+15	0.5084	0.07	Q				V
22+20	0.5087	0.05	Q				V
22+25	0.5090	0.05	Q				V
22+30	0.5094	0.05	Q				V
22+35	0.5097	0.05	Q				V
22+40	0.5101	0.05	Q				V
22+45	0.5104	0.05	Q				V
22+50	0.5108	0.05	Q				V
22+55	0.5111	0.05	Q				V
23+ 0	0.5114	0.05	Q				V
23+ 5	0.5118	0.05	Q				V
23+10	0.5121	0.05	Q				V
23+15	0.5125	0.05	Q				V
23+20	0.5128	0.05	Q				V
23+25	0.5132	0.05	Q				V
23+30	0.5135	0.05	Q				V
23+35	0.5138	0.05	Q				V
23+40	0.5142	0.05	Q				V
23+45	0.5145	0.05	Q				V
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23+55	0.5152	0.05	Q				V
24+ 0	0.5156	0.05	Q				V

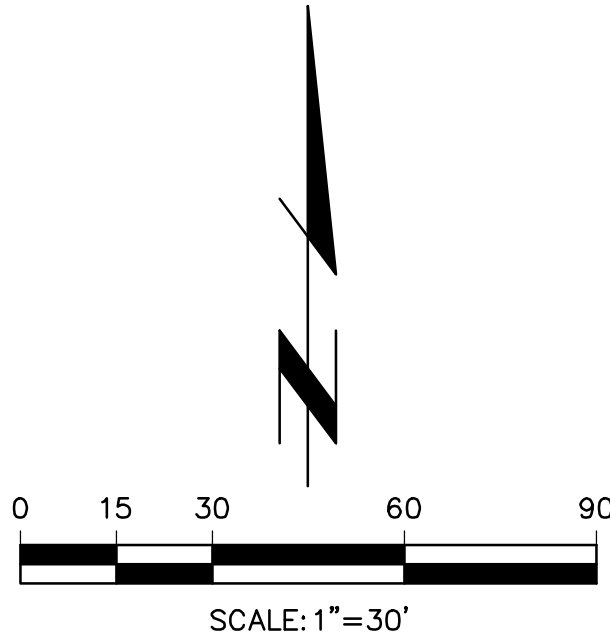
APPENDIX D

HYDROLOGY MAPS



LEGEND

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



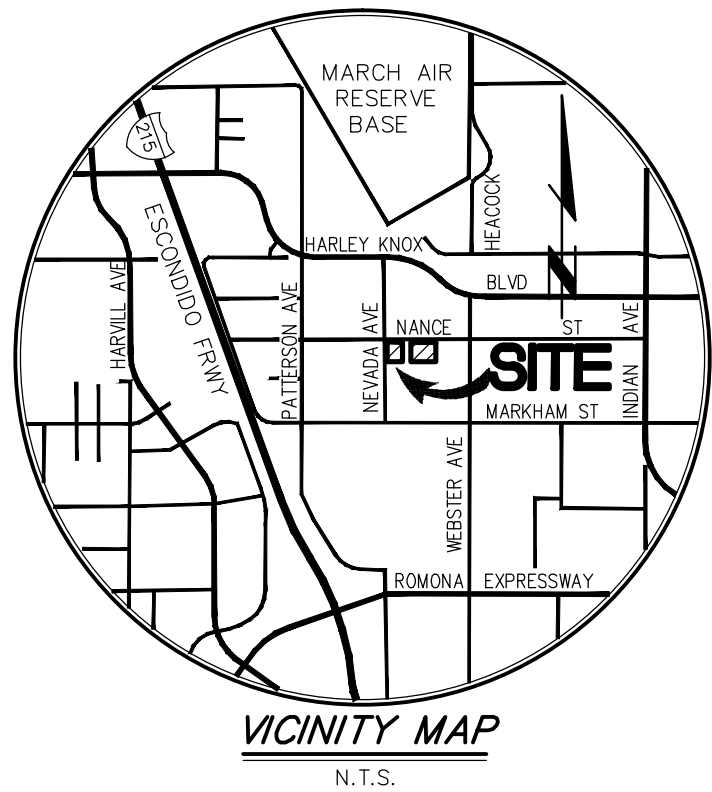
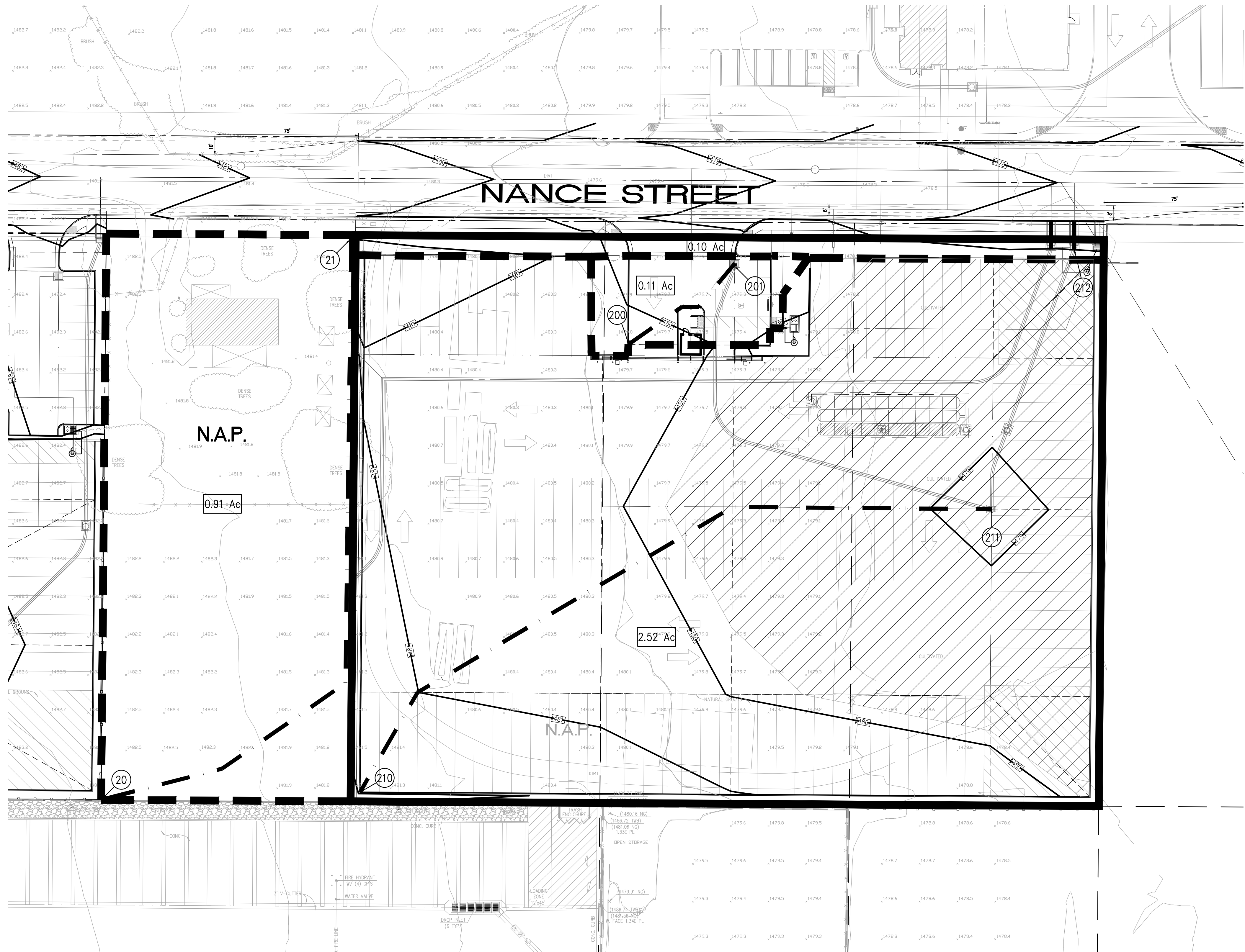
CITY OF PERRIS PUBLIC WORKS DEPARTMENT	
EXISTING CONDITION HYDROLOGY MAP	
PERRIS TRAILER YARD	
NANCE ST. AND NEVADA AVE.	
Designed by _____ Date _____ Checked by _____ Date _____	Approved by _____ Date _____ Public Works Director R.C.E. XXXXX
Designed by _____ Date _____ Checked by _____ Date _____	Sheet 1 of 1 Sheets

PREPARED FOR

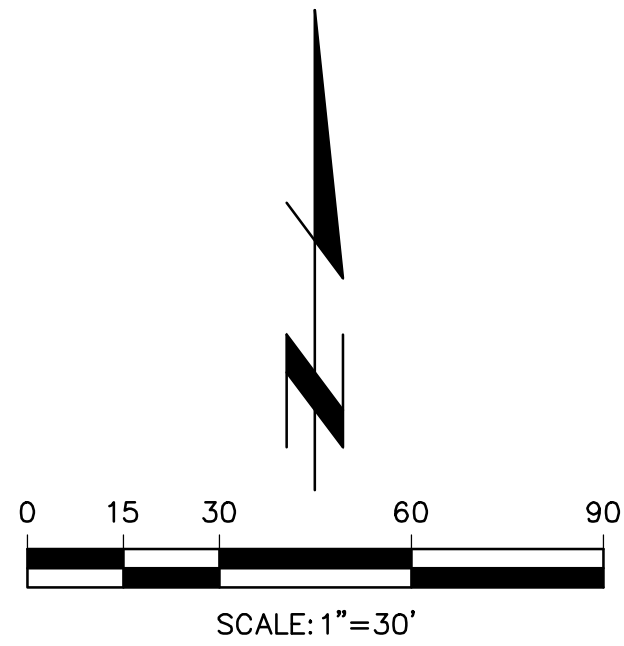
LAKE CREEK INDUSTRIAL, LLC
1302 BRITTANY CROSS RD.
SANTA ANA, CA. 92705
CONTACT: BOB KUBICHEK

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 321-4811 FAX: (714) 321-4173

DATE: 07/30/2023



LEGEND	
	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	FLOW PATH
	SUBAREA AREA
	NODE NUMBER
	PONDING LIMITS



CITY OF PERRIS PUBLIC WORKS DEPARTMENT	
PROPOSED CONDITION HYDROLOGY MAP	
PERRIS TRAILER YARD	
NANCE ST. AND NEVADA AVE.	
Designed by _____ Date _____ Checked by _____ Date _____	Approved by _____ Date _____
Designed by _____ Date _____ Checked by _____ Date _____	Public Works Director _____ R.C.E. _____
Sheet 1 of 1 Sheets	JN: 4130

PREPARED FOR LAKE CREEK INDUSTRIAL, LLC 1302 BRITTANY CROSS RD. SANTA ANA, CA. 92705 CONTACT: BOB KUBICHEK	Thienes Engineering, Inc. CIVIL ENGINEERING • LAND SURVEYING 14349 FIRESTONE BOULEVARD LA MIRADA, CALIFORNIA 90638 PH (714) 321-4811 FAX (714) 321-4173
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