TEMECULA VALLEY MIN STORAGE
CUP 190012
SWC KELLER ROAD AND WINCHESTER ROAD
APN: 476-010-060
WINCHESTER, CALIFORNIA

PRELIMINARY HYDROLOGY ANALYSIS

PREPARED BY:
THE PRIZM GROUP
310 North Cota Street, Suite I
Corona, CA 92880

SIGNATURE: Vincent Kleppe

DATE: 4-7-22

REGISTERED PROFESSIONAL ENGINEER
VINCENT GERALD KLEPPE
No. 55750
CIVIL
STATE OF CALIFORNIA

JOB NO. 19-004

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PROJECT DESCRIPTION

The site for proposed gas station site is located near the southwest corner of the intersection of Foothill Blvd. and Alder Avenue in Fontana. The site is approximately 4.6 acres and drains from northeast to southwest in a sheet flow fashion. This area flows to a unlined channel which in turn creates a hydraulic condition of concern (HCOC) for the project.

The proposed project includes constructing a mini storage facility with indoor storage as well as outdoor boat and RV storage. The site is currently a pasture dry land setting with annual native grass. On site house keeping and best management practices (BMP'S) will be incorporated in the site design and operation to conform to NPDES requirements.

PURPOSE

The purpose of this preliminary study is to analyze the 24 hour storm duration for the 2 and 10 year storm events of the developed site storm runoff flows to determine if HCOC mitigation is required, and also detention basin storage requirements to mitigate the increased runoff for various storm events. Table 2 shows the results of the 2 year 24 hour storm event unit hydrograph analysis. The site runoff increased from 0.10 cfs to 0.76 cfs after development. Since the increase is greater than 10% the HCOC will require mitigation. See appendix F & G for hydrograph analysis results.

SITE HYDROLOGY

Post development storm flows are conveyed across the site via a system of concrete swales, catch basins, and drain pipes to a water quality treatment structure. An internal bypass diverts runoff to the underground detention basin after exceeding the WQMP flow rate. Treated flows are also piped to the underground detention structure.

For the preliminary design the detention volume required will be calculated as the difference between the developed and undeveloped storm volumes for the 10 year 24 hour event. As seen in table 3 the difference in volume is 0.6105 acre feet (26,594 cubic feet). See appendix F & G for hydrograph analysis results. Utilizing a 48 inch diameter pipe structure for storage, a preliminary estimate of 2,116 feet of pipe will be required to accommodate the required volume. For this site the soil percolation test conducted by Earth Strata Geotechnical Services, Inc., indicated that infiltration was poor and not recommended to be incorporated in the site design. For this reason the underground detention structure will not incorporate perforations. All flows will exit the detention structure through a controlled outlet orifice and weir to meter the flow for WQMP and to mitigate the increased runoff as necessary. Runoff is then piped to a headwall outleting at the south end of the site.

TABLE 1 - SITE RUNOFF RESULTS RATIONAL METHOD

1 HOUR STORM EVENT	UNDEVELOPED CONDITION	DEVELOPED CONDITION	AREAS BYPASSING BASIN	
			AREA A	AREA D
	Q (CFS)	Q (CFS)	Q (CFS)	Q (CFS)
2 YEAR	2.38	3.87	.43	.09
5 YEAR	3.45	5.10	.61	.13
10 YEAR	5.28	6.14	.85	.19
100 YEAR	9.05	9.27	1.33	.31

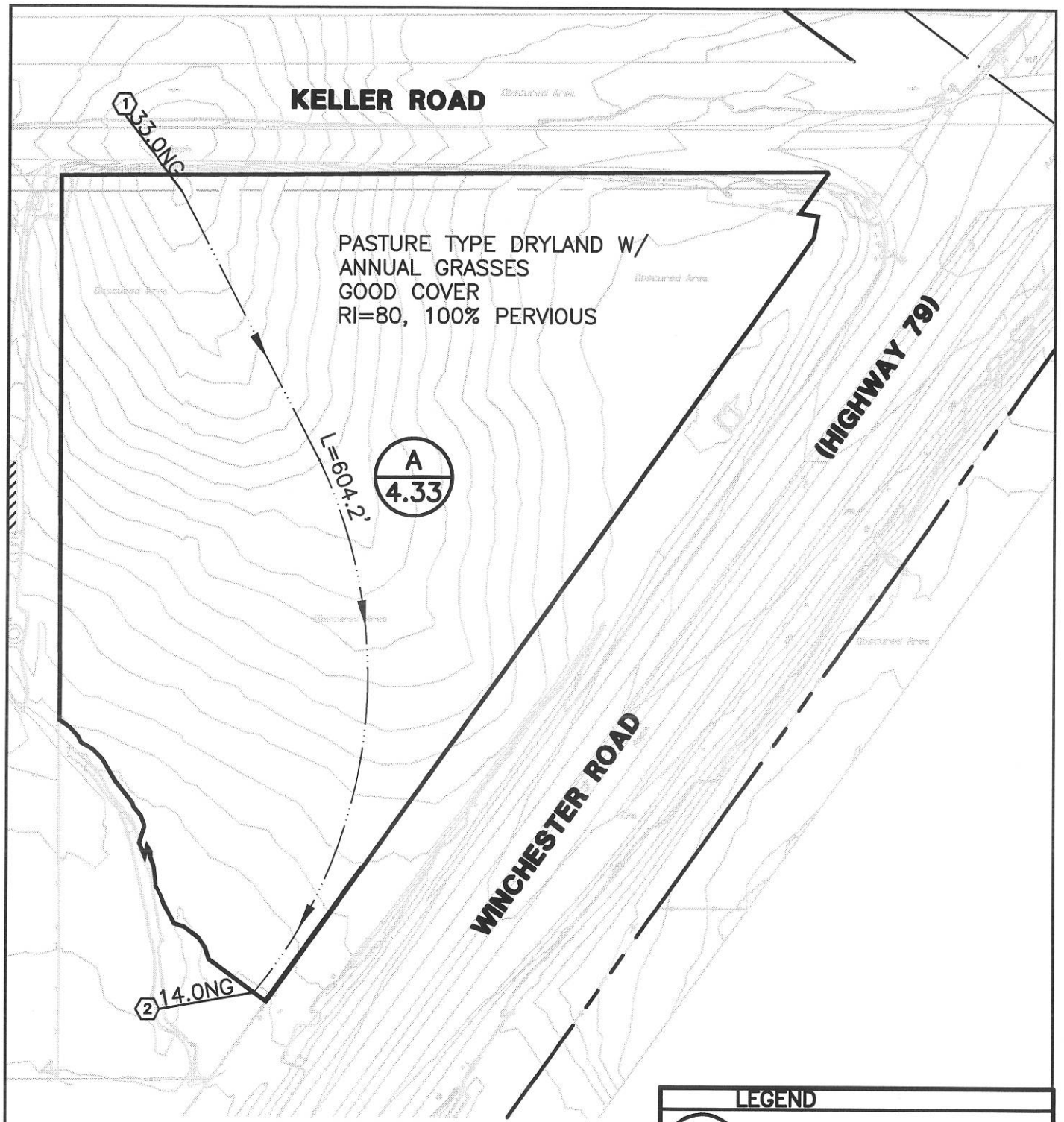
TABLE 2 - HYDROGRAPH METHOD RESULTS 2 YEAR EVENT

STORM EVENT	DURATION (HRS)	UNDEVELOPED 4.33 ACRES Qp (CFS)	DEVELOPED 4.33 ACRES Qp (CFS)
2 YEAR	24	0.10	0.76

TABLE 3 - HYDROGRAPH METHOD RESULTS 10 YEAR EVENT

STORM EVENT	DURATION (HRS)	UNDEVELOPED 4.33 ACRES Qp (CFS)	VOLUME (ACRE FEET)	DEVELOPED 4.33 ACRES Qp (CFS)	VOLUME (ACRE FEET)	DIFFERENCE (ACRE FEET)
10 YEAR	24	0.65	0.1536	1.32	0.7641	0.6105

APPENDIX A



100 0 100 200

Scale 1" = 100'

LEGEND

A1 / XX	AREA DESIGNATION / AREA (AC.)
→	INDICATES DIRECTION OF FLOW
2	NODE NUMBER
—··—	FLOW PATH
——	DRAINAGE AREA BOUNDARY
	SOIL TYPE "D"

DRAWN BY: VGK

DATE: 1-6-22

JOB. NO.: 19-004

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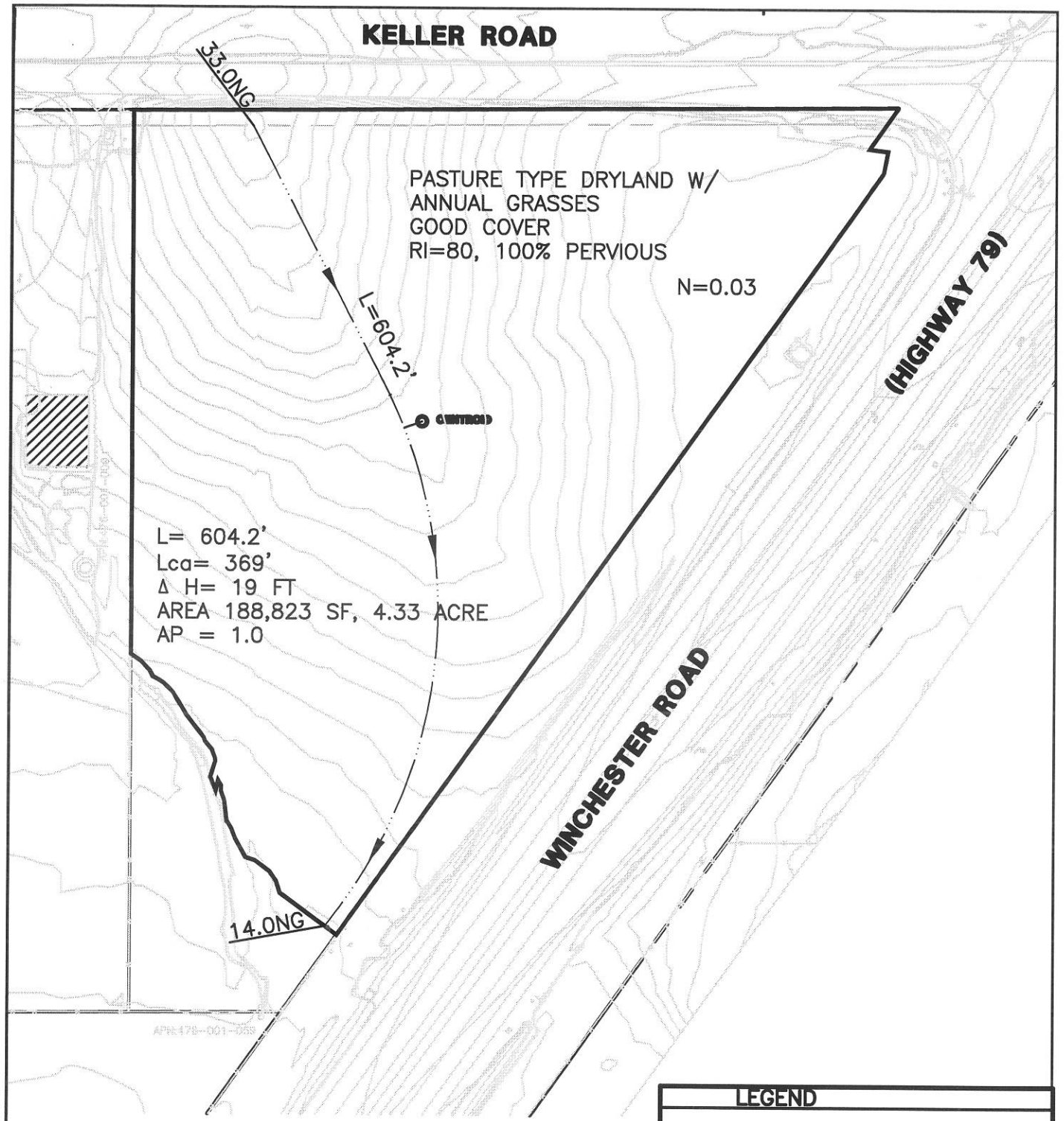
PROJECT:

TEMECULA VALLEY SELF STORAGE
UNDEVELOPED CONDITION
RATIONAL HYDROLOGY EXHIBIT

SHT. NO. 1 OF 1



LEGEND

INDICATES DIRECTION OF FLOW — SOIL TYPE "D"

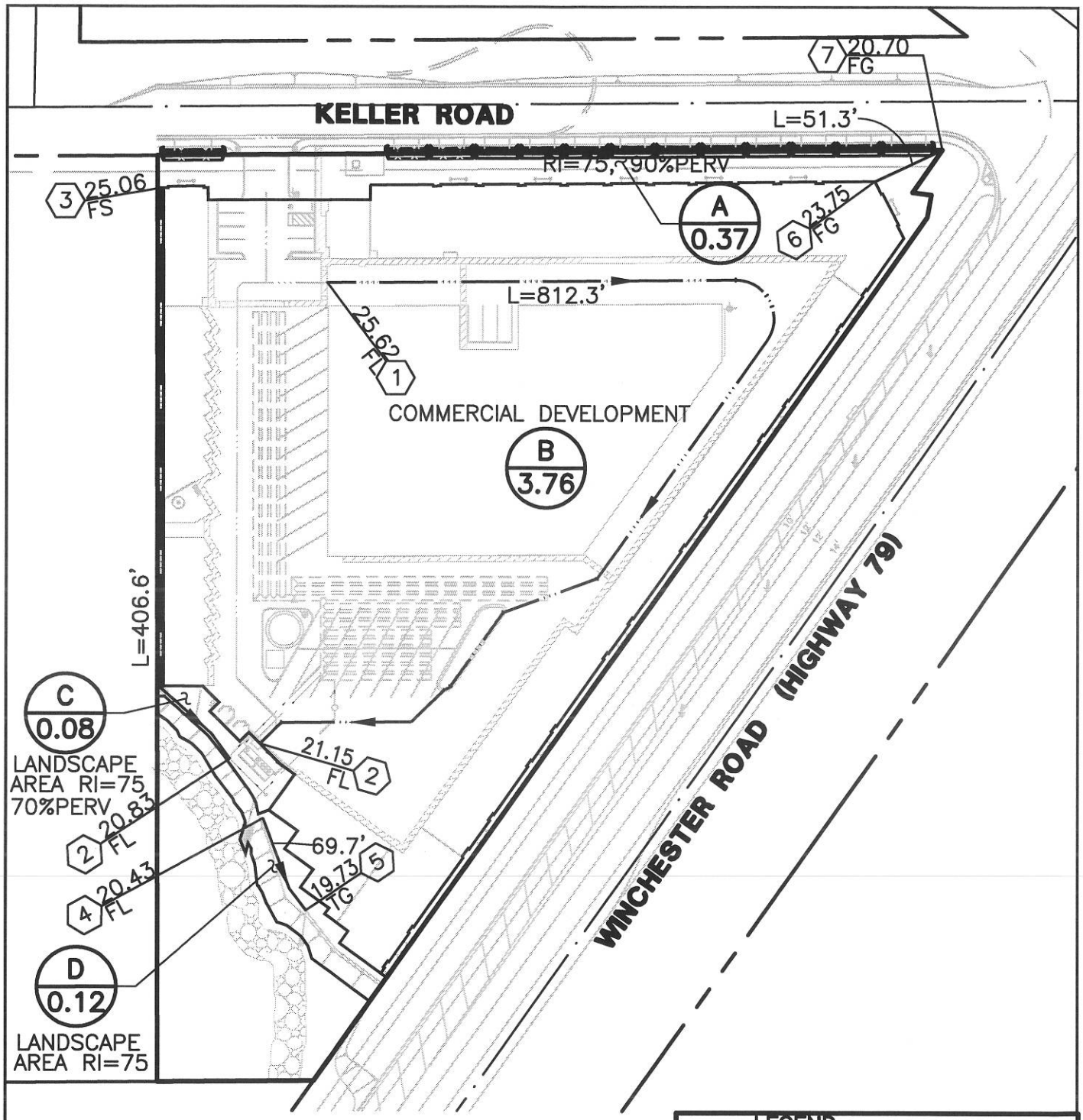
FLOW PATH

DRAINAGE AREA BOUNDARY

100 0 100 200

Scale 1" = 100'

DRAWN BY: VGK DATE: 1-6-22 JOB. NO.: 19-004 FILE: P:\TPG\19\19-004\HYDROLOGY \19-004 UNDEV HYDRO HYDROLOGY.DWG	THE PRIZM GROUP CIVIL ENGINEERS AND LAND SURVEYORS • CYRAX 3-D LASER SCANNING • GPS & ROBOTIC SURVEYING • GEOMATIC ENGINEERING • CIVIL ENGINEERING • LAND PLANNING 310 N. COTA ST. SUITE I, CORONA, CA 92878 PHONE: (951) 737-4406 www.the-prizm-group.com	PROJECT: TEMECULA VALLEY SELF STORAGE UNDEVELOPED CONDITION HYDROGRAPH METHODHYDROLOGY EXHIBIT	SHT. NO. 1 OF 1



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Scale 1" = 100'

LEGEND

- A1 / 10.00 — AREA DESIGNATION / AREA (AC.) — INDICATES DIRECTION OF FLOW
- 2 — NODE NUMBER
- FLOW PATH
- DRAINAGE AREA BOUNDARY — SOIL TYPE "D"

DRAWN BY: VGK

DATE: 4-7-22

JOB. NO.: 19-004

FILE: P:\TPG\19\19-004\HYDROLOGY\19-004 DEVELOPED RAT HYDROLOGY.DWG

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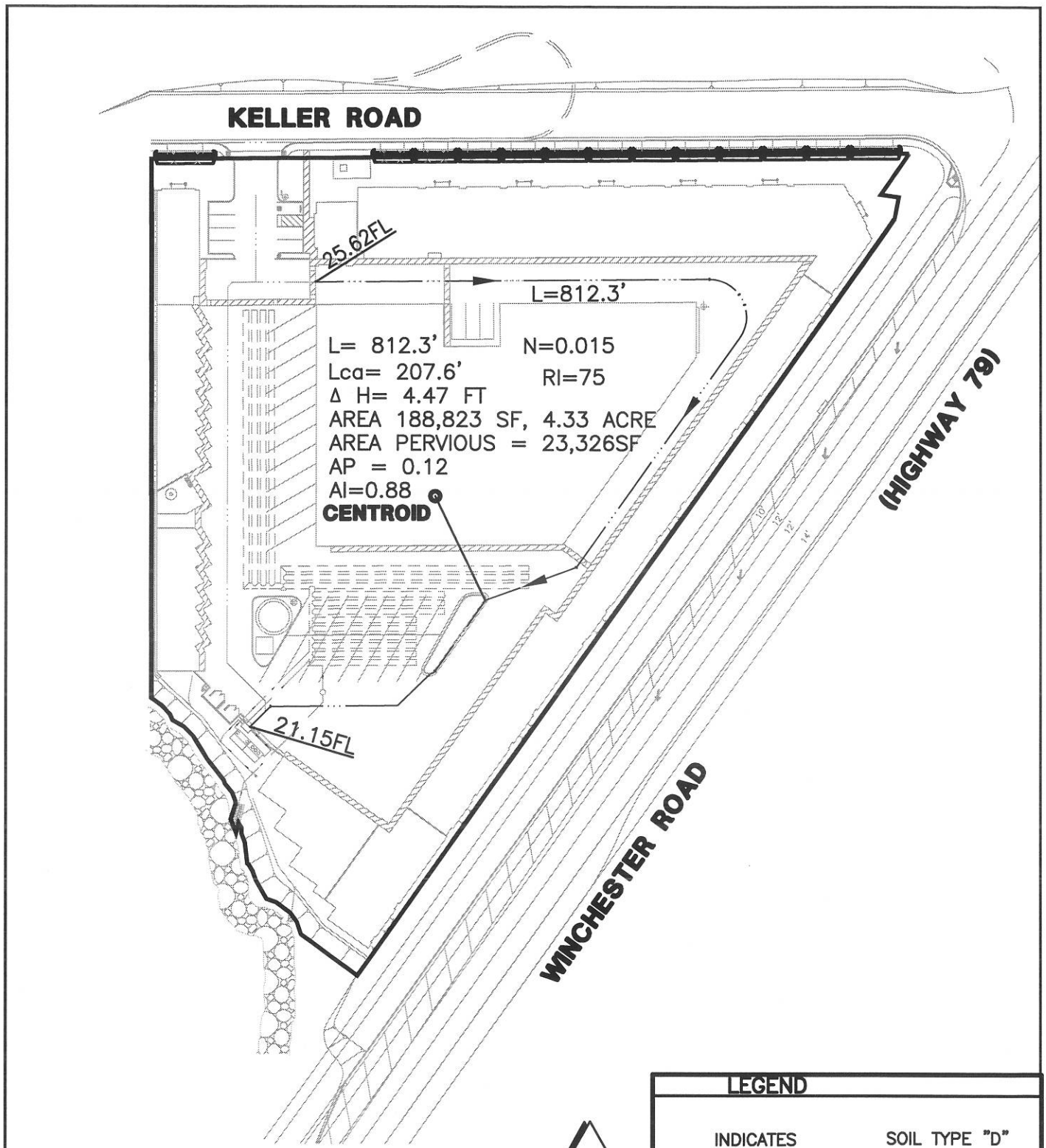
TEMECULA VALLEY SELF STORAGE
DEVELOPED CONDITION
RATIONAL DRAINAGE MAP

SHT. NO. 1 OF 1



100 0 100 200

Scale 1" = 100'

LEGEND

INDICATES DIRECTION OF FLOW	SOIL TYPE "D"
FLOW PATH	
DRAINAGE AREA BOUNDARY	

DRAWN BY: VGK

DATE: 4-7-22

JOB. NO.: 19-004

FILE: P:\TPG\19\19-004\HYDROLOGY\19-004 DEVELOPED HYDRO HYDROLOGY.DWG

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TEMECULA VALLEY SELF STORAGE
DEVELOPED HYDROGRAPH
HYDROLOGY EXHIBIT

SHT. NO. 1 OF 1

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

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

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HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

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

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

Notes:

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

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

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

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

5. Reference Bibliography item 17.

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

ACTUAL IMPERVIOUS COVER

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

Notes:

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

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

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

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IMPERVIOUS COVER FOR DEVELOPED AREAS

RUNOFF COEFFICIENT CURVE DATA

The data in the following tables may be used to develop runoff coefficient (C) curves for any combination of runoff index (RI) number and antecedent mositure condition (AMC). For an RI number with an AMC of II (from Plate D-5.5) enter the tables on the following pages and plot the "C" curve data directly on Plate D-5.8. "C" curve data is given for even RI numbers only, but values may easily be interpolated for odd RI numbers.

For an AMC of I or III enter the tabulation on this page with the RI for AMC II, and read the appropriate RI for AMC I or III. Use this revised RI to enter the tables on the following pages to determine "C". For example if RI = 40 for AMC II, then RI = 22 for AMC I and RI = 60 for AMC III.

AMC ADJUSTMENT RELATIONSHIPS

RI FOR AMC II	RI FOR OTHER AMC CONDITIONS: AMC I	AMC III	RI FOR AMC II	RI FOR OTHER AMC CONDITIONS: AMC I	AMC III
10	--	22	55	35	74
11	--	24	56	36	75
12	--	25	57	37	75
13	--	27	58	38	76
14	--	28	59	39	77
15	--	30	60	40	78
16	--	31	61	41	78
17	--	33	62	42	79
18	--	34	63	43	80
19	--	36	64	44	81
20	--	37	65	45	82
21	10	38	66	46	82
22	10	39	67	47	83
23	11	41	68	48	84
24	11	42	69	50	84
25	12	43	70	51	85
26	12	44	71	52	86
27	13	46	72	53	86
28	14	47	73	54	87
29	14	49	74	55	88
30	15	50	75	57	88
31	16	51	76	58	89
32	16	52	77	59	89
33	17	53	78	60	90
34	18	54	79	62	91
35	18	55	80	63	91
36	19	56	81	64	92
37	20	57	82	66	92
38	21	58	83	67	93
39	21	59	84	68	93
40	22	60	85	70	94
41	23	61	86	72	94
42	24	62	87	73	95
43	25	63	88	75	95
44	25	64	89	76	96
45	26	65	90	78	96
46	27	66	91	80	97
47	28	67	92	81	97
48	29	68	93	83	98
49	30	69	94	85	98
50	31	70	95	87	98
51	31	70	96	89	99
52	32	71	97	91	99
53	33	72	98	94	99
54	34	73	99	97	--

APPENDIX B

LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

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HYDROLOGY MANUAL

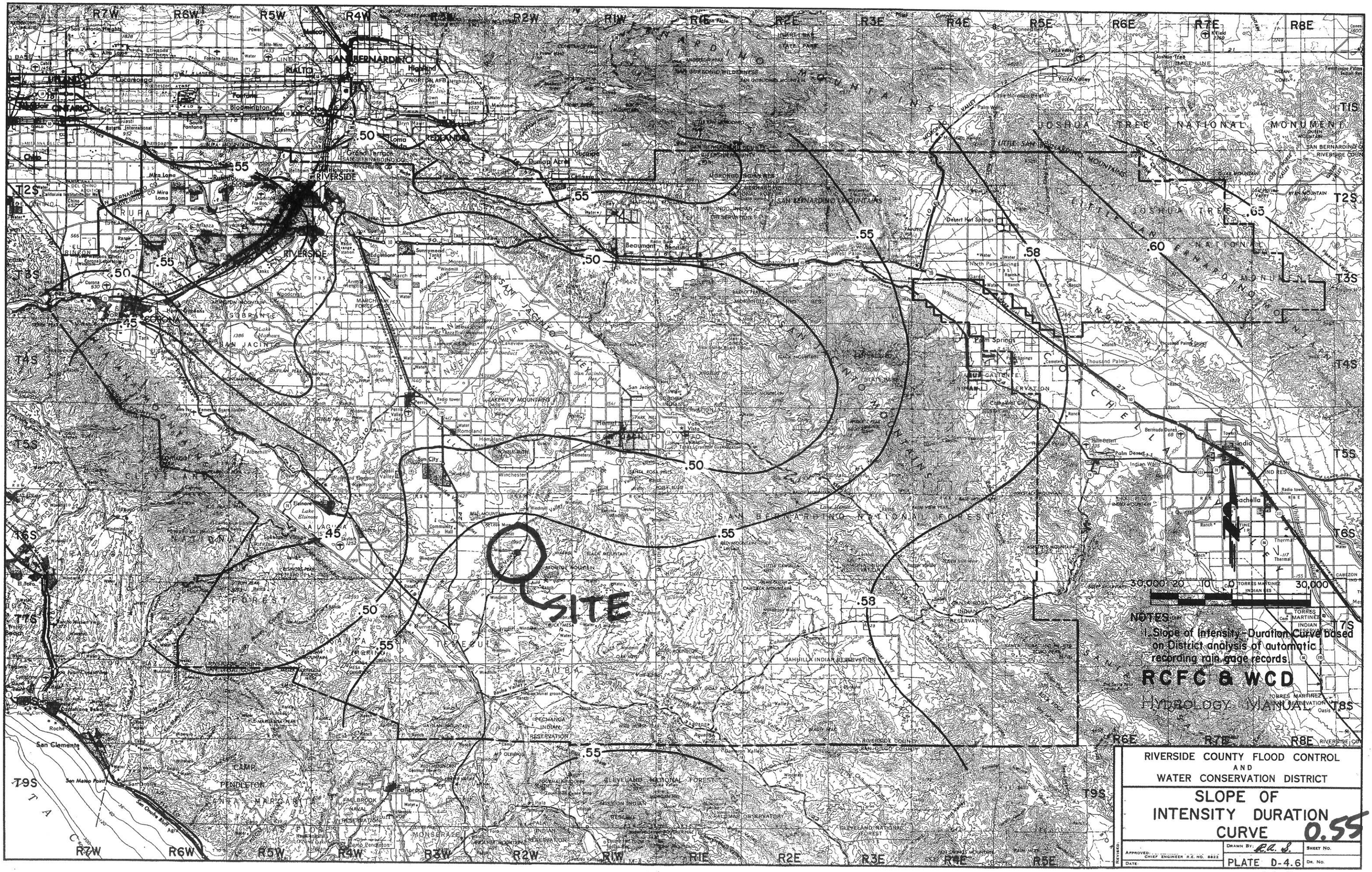
0 FEET 5000

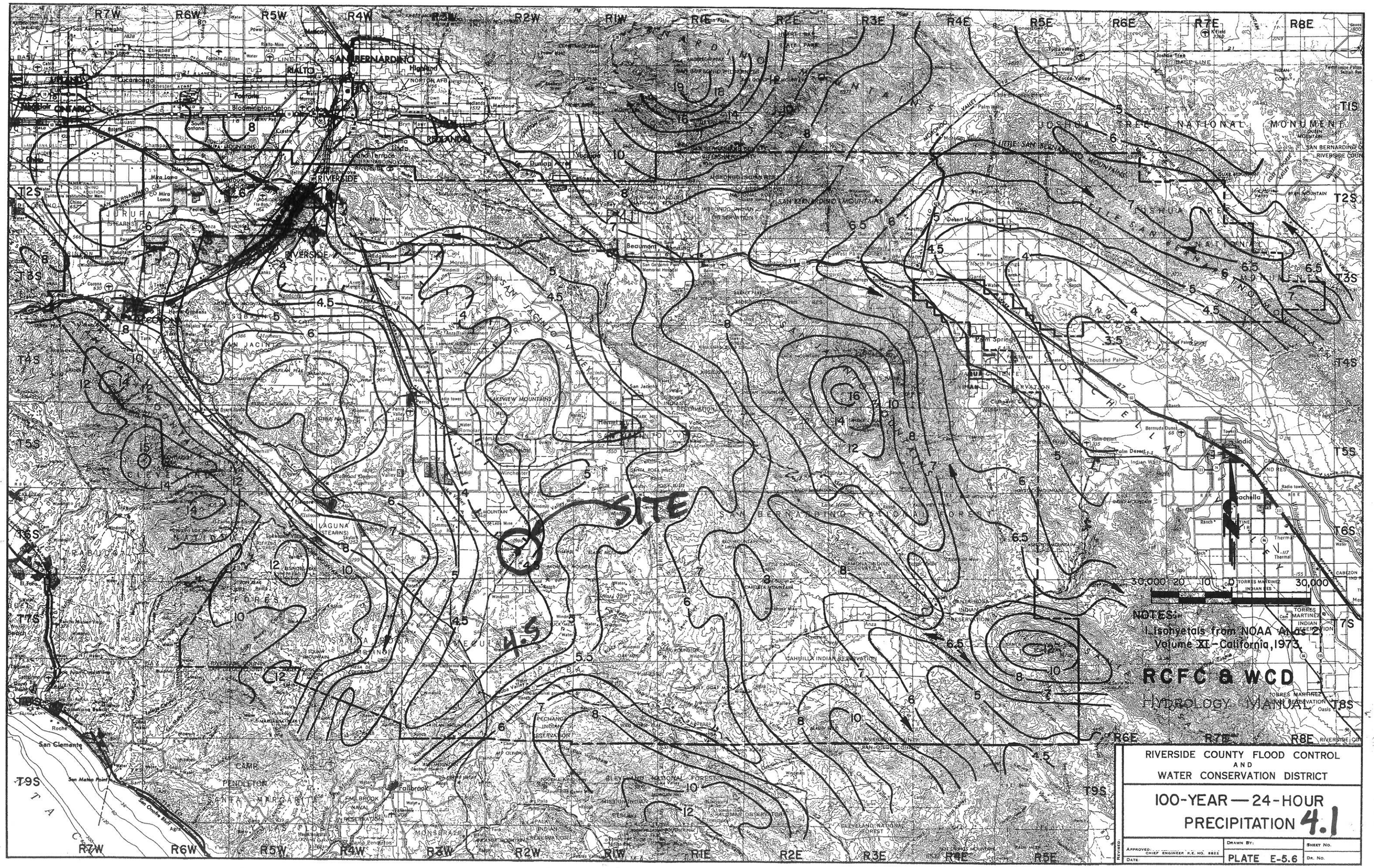
HYDROLOGIC SOILS GROUP MAP FOR WINCHESTER

"D"

PLATE C-1.43

APPENDIX C


SITE
.45
.50
.55
.58
.60
.65
30,000 20 10 0 30,000
NOTES:
1. Slope of Intensity-Duration Curve based on District analysis of automatic recording rain gage records.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SLOPE OF
INTENSITY DURATION
CURVE 0.55
APPROVED:
CHIEF ENGINEER R.E. NO. 8822
DATE:
DRAWN BY:
SHEET NO.
PLATE D-4.6
DR. NO.
REVISED:

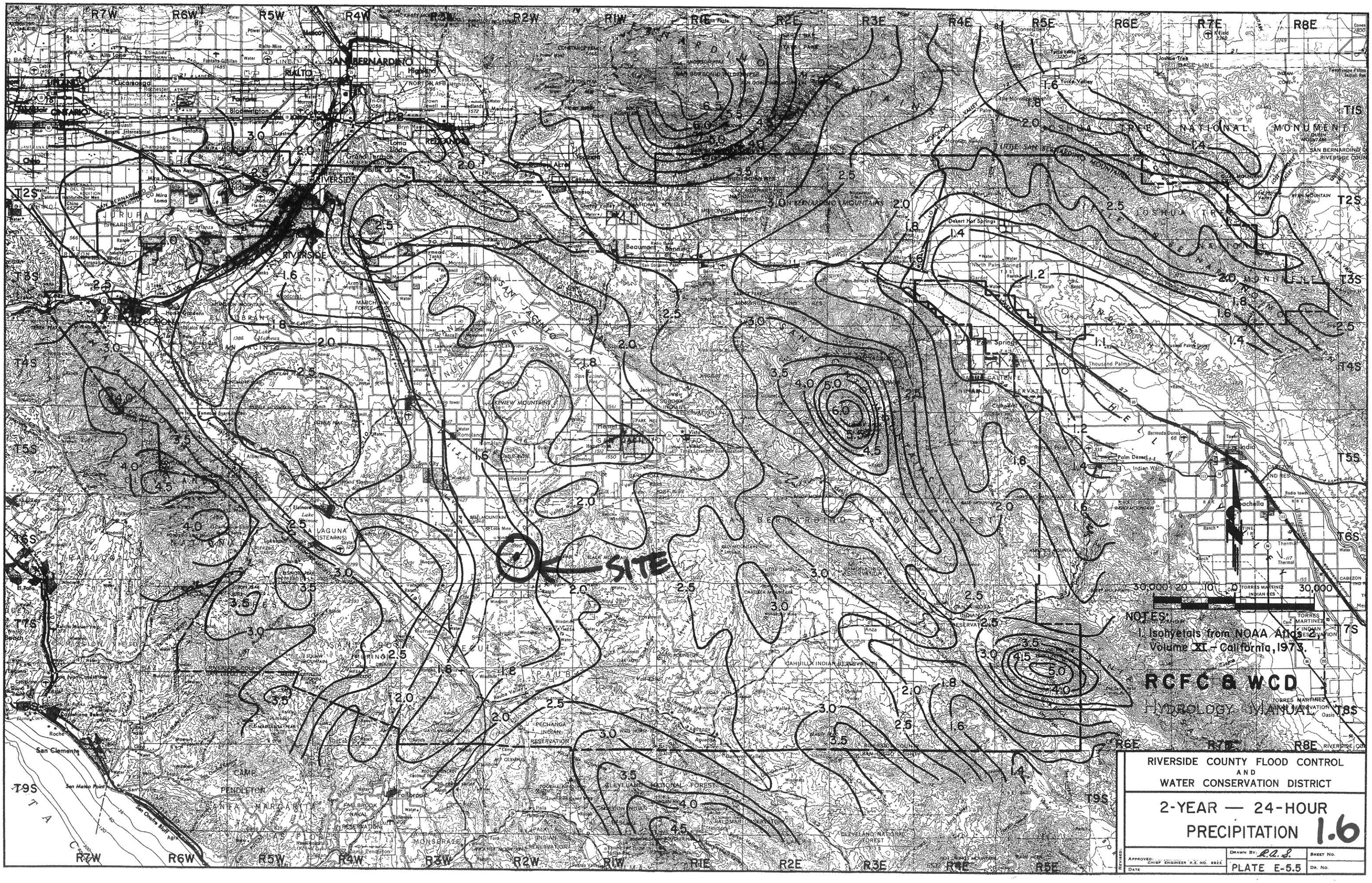


RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

100-YEAR — 24-HOUR
PRECIPITATION 4.1

APPROVED: CHIEF ENGINEER R.E. NO. 8822	DRAWN BY:	SHEET NO.
DATE	PLATE E-5.6	DR. NO.

REVISED: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30,000 20 10 0 30,000
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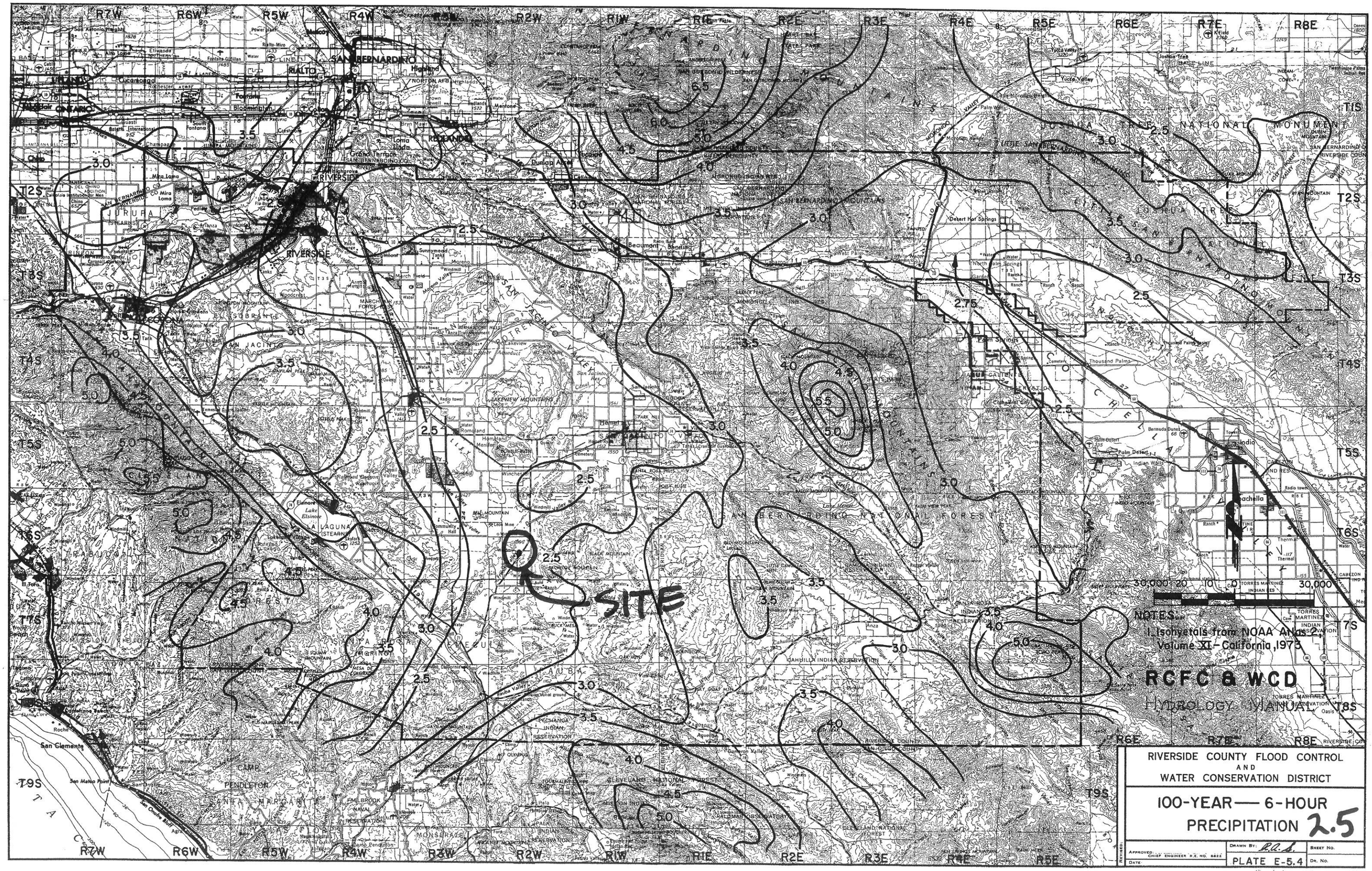
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR
PRECIPITATION 1.6
DRAWN BY: R.A.S.
SHEET NO.
APPROVED: CHIEF ENGINEER R.E. NO. 6822
DATE
PLATE E-5.5
DR. NO.
REVISED



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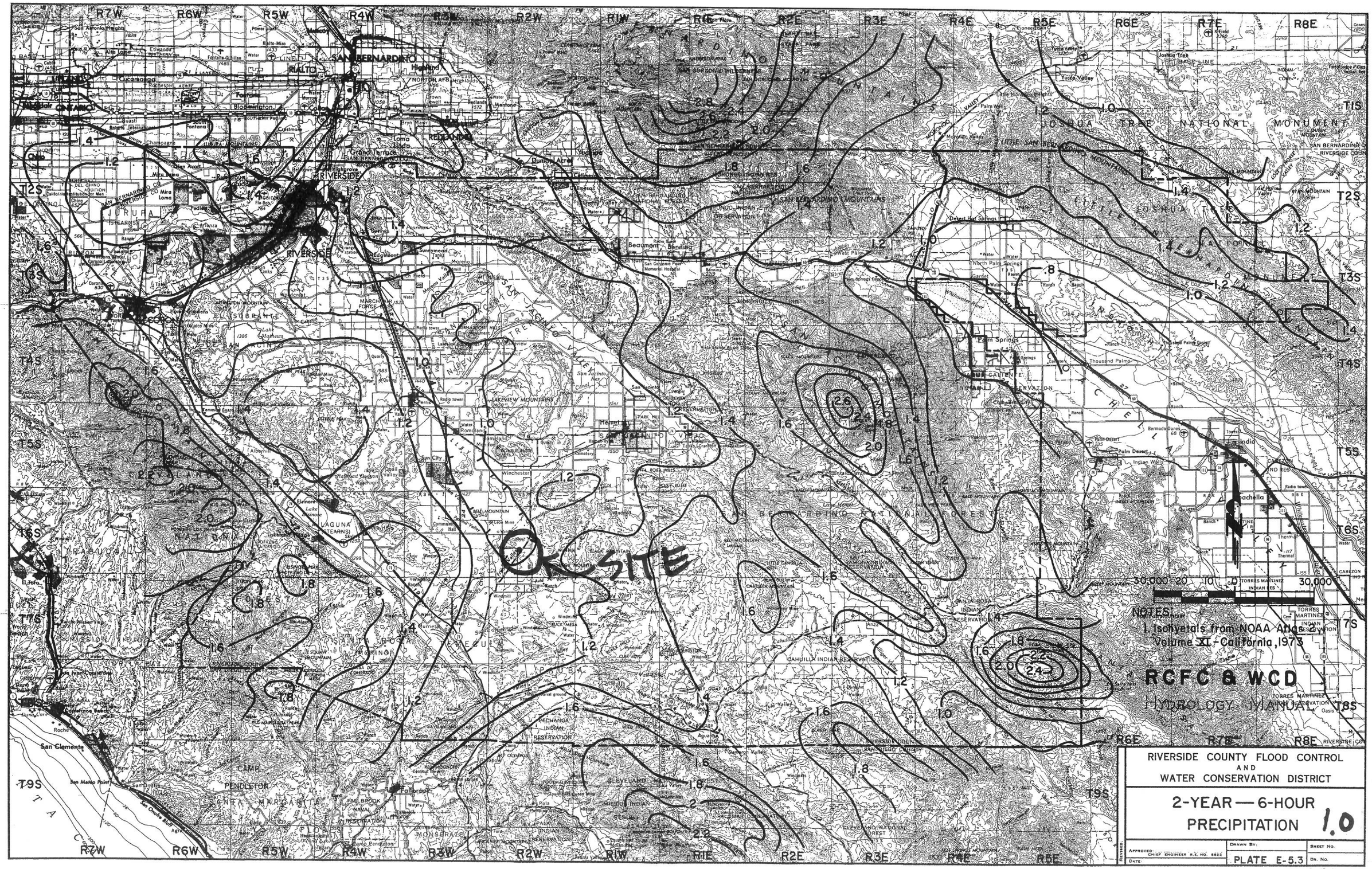
RCFC & WCD
HYDROLOGY MANUAL
30,000 20 10 0 30,000
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR
PRECIPITATION 2.5
PLATE E-5.4



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HYDROLOGY MANUAL
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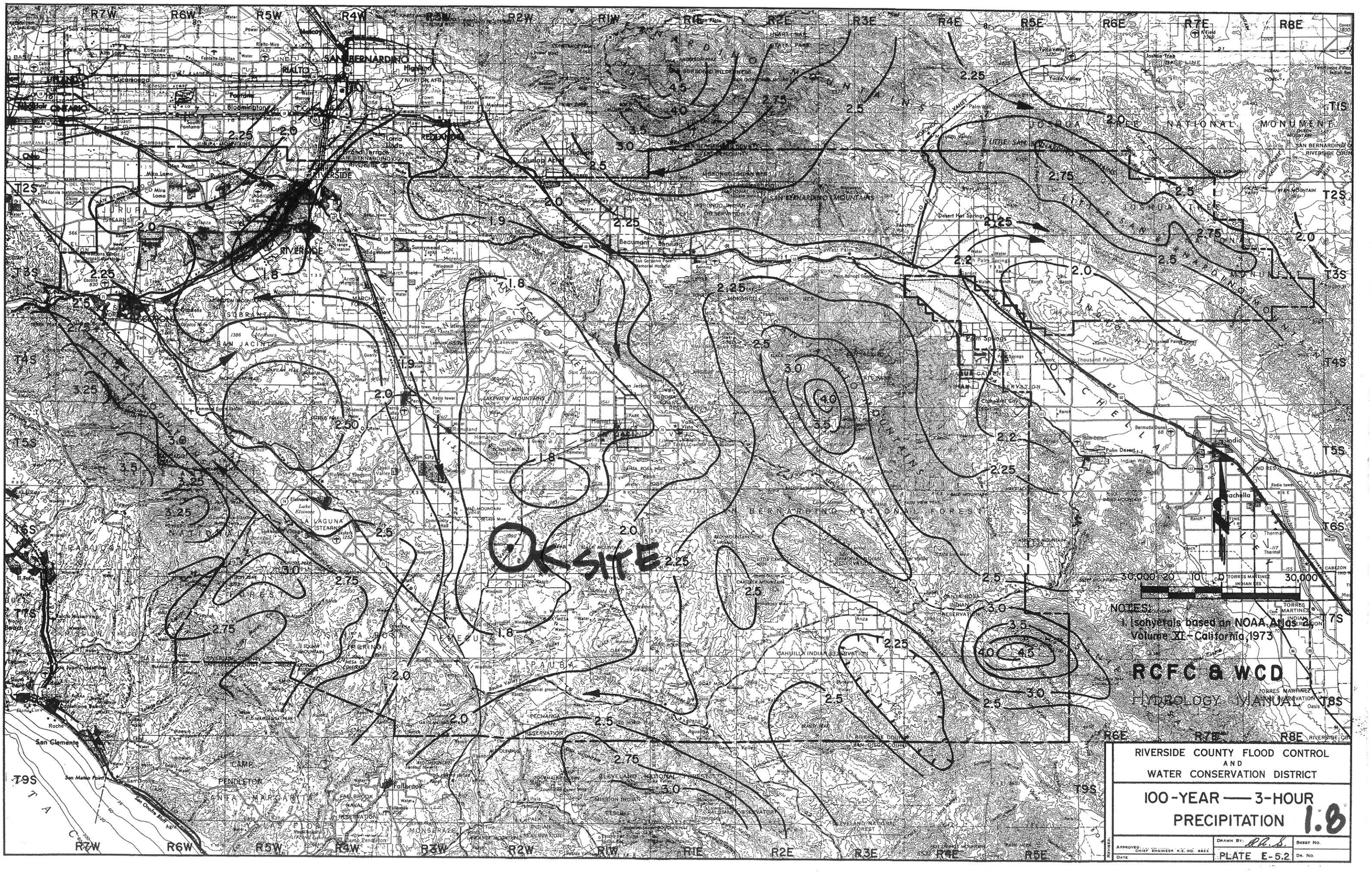
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION 1.0
PLATE E-5.3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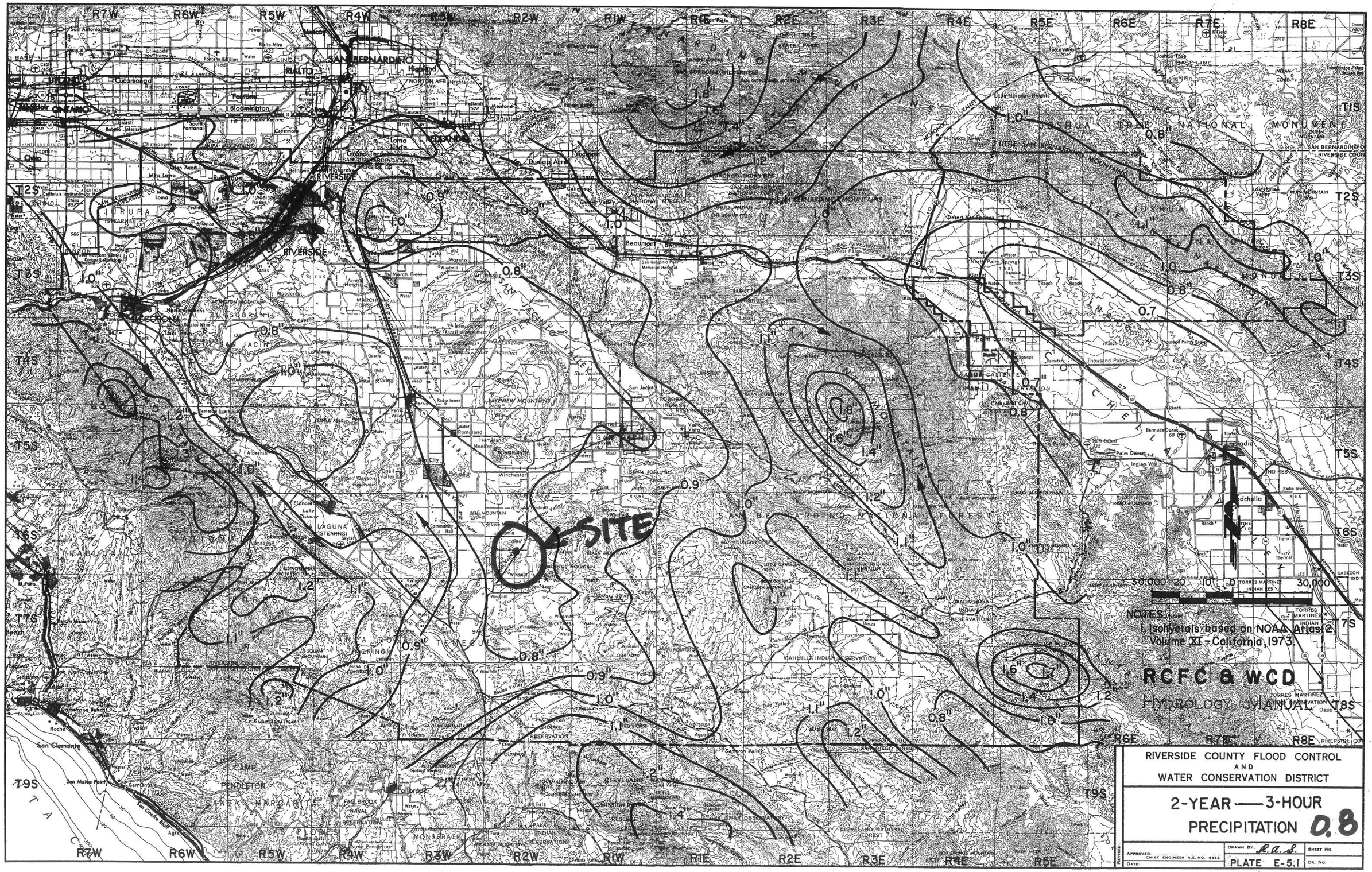
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
30,000 20 10 0 30,000
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION 1.8
PLATE E-5.2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RCFC & WCD
HYDROLOGY MANUAL
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30,000' 20' 10' 0 30,000
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 3-HOUR
PRECIPITATION 0.8
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DATE:
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PLATE E-5.1
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DR. NO.
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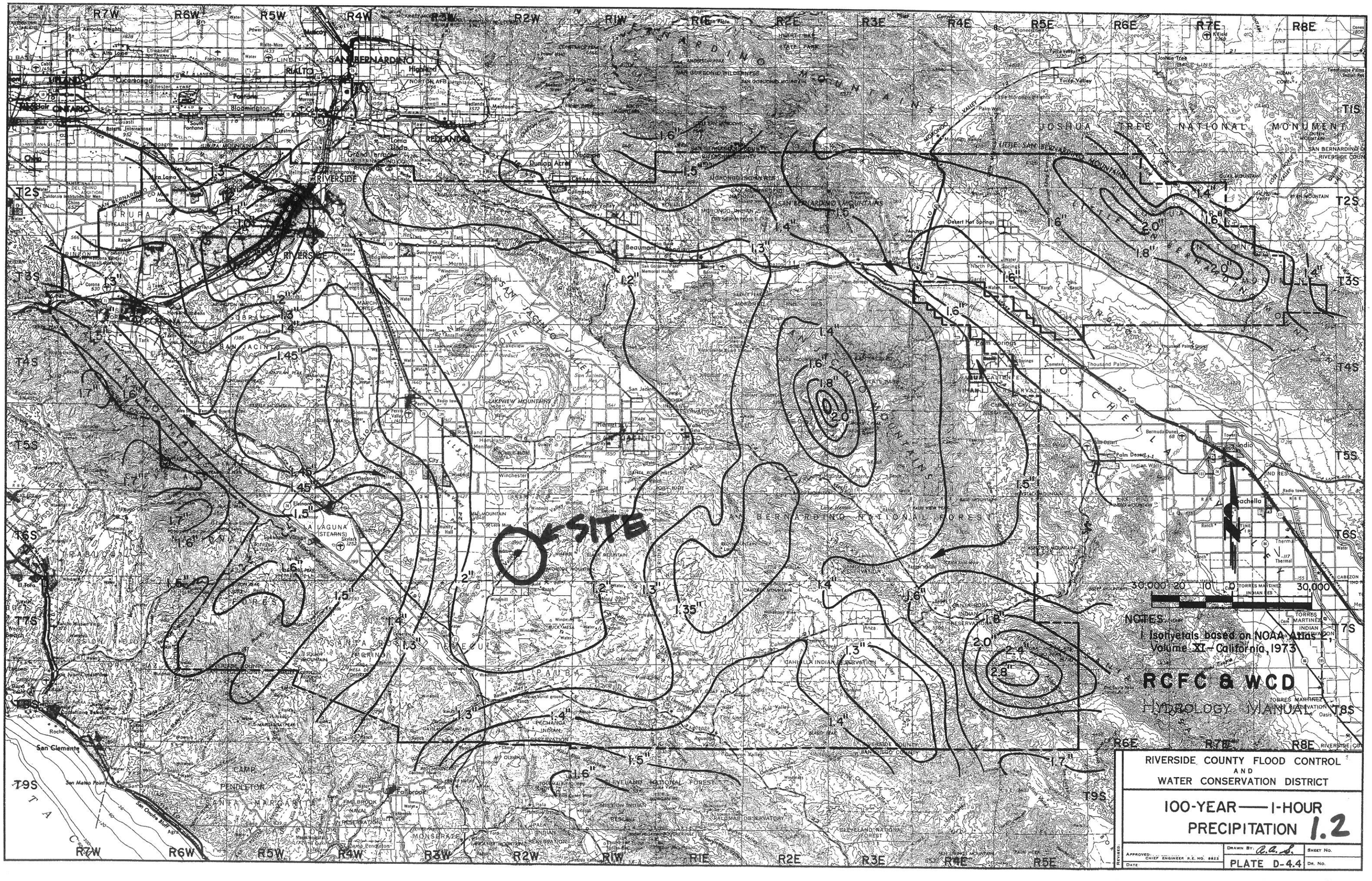
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1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
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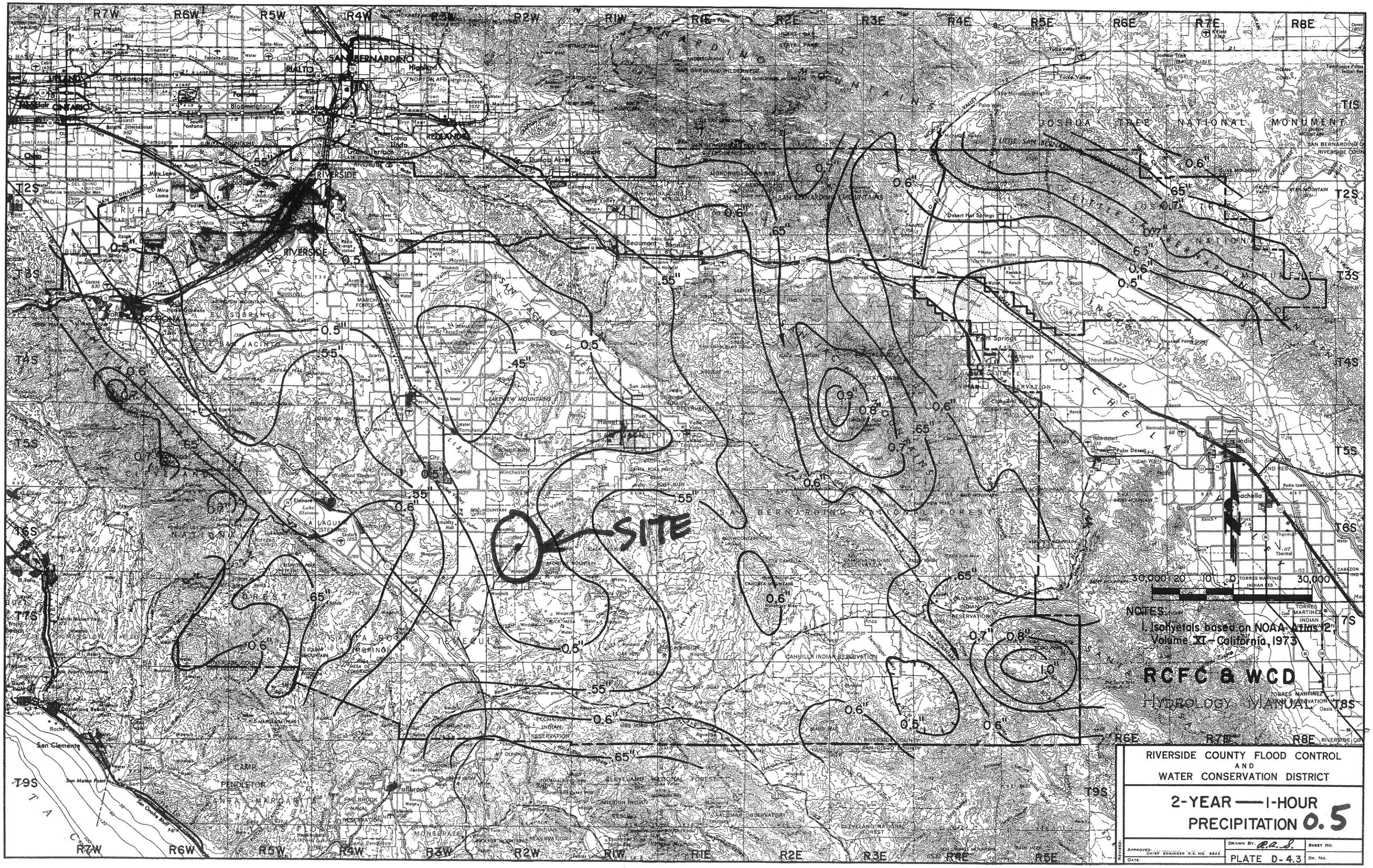
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION 1.2
PLATE D-4.4
SAN BERNARDINO
RIVERSIDE
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO MOUNTAINS
BERNARDINO NATIONAL FOREST
CAMP PENDLETON
30,000 20 10 0 30,000



RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

2-YEAR — 1-HOUR
PRECIPITATION 0.5

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DATE:	PLATE D-4.3	DR. NO.

REVISED:

APPENDIX D

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/04/22 File:19004UNDEVRAT.out

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19-004 UNDEVELOPED CONDITION RATIONAL STUDY 2 YEAR EVENT

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

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

Program License Serial Number 6106

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

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.520(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 604.200(Ft.)
Top (of initial area) elevation = 33.000(Ft.)
Bottom (of initial area) elevation = 14.000(Ft.)
Difference in elevation = 19.000(Ft.)
Slope = 0.03145 s(percent)= 3.14
TC = k(0.589)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.246 min.
Rainfall intensity = 1.061(In/Hr) for a 2.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.518
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1) = 63.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.379(CFS)
Total initial stream area = 4.330(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 80.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/04/22 File:19004UNDEVRAT.out

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19-004 UNDEVELOPED CONDITION RATIONAL STUDY 5 YEAR EVENT

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

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

Program License Serial Number 6106

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

Storm event (year) = 5.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 5.0
Calculated rainfall intensity data:
1 hour intensity = 0.680(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 604.200(Ft.)
Top (of initial area) elevation = 33.000(Ft.)
Bottom (of initial area) elevation = 14.000(Ft.)
Difference in elevation = 19.000(Ft.)
Slope = 0.03145 s(percent)= 3.14
TC = k(0.589)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.246 min.
Rainfall intensity = 1.386(In/Hr) for a 5.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.575
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1) = 63.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 3.450(CFS)
Total initial stream area = 4.330(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 80.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/04/22 File:19004UNDEVRAT.out

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19-004 UNDEVELOPED CONDITION RATIONAL STUDY 10 YEAR EVENT

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

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

Program License Serial Number 6106

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

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

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.800(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 604.200(Ft.)
Top (of initial area) elevation = 33.000(Ft.)
Bottom (of initial area) elevation = 14.000(Ft.)
Difference in elevation = 19.000(Ft.)
Slope = 0.03145 s(percent)= 3.14
TC = k(0.589)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.246 min.
Rainfall intensity = 1.631(In/Hr) for a 10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.747
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 80.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 5.278(CFS)
Total initial stream area = 4.330(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 80.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/04/22 File:19004UNDEVRAT.out

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19-004 UNDEVELOPED CONDITION RATIONAL STUDY 100 YEAR EVENT

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

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

Program License Serial Number 6106

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

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 604.200(Ft.)
Top (of initial area) elevation = 33.000(Ft.)
Bottom (of initial area) elevation = 14.000(Ft.)
Difference in elevation = 19.000(Ft.)
Slope = 0.03145 s(percent)= 3.14
TC = k(0.589)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.246 min.
Rainfall intensity = 2.447(In/Hr) for a 100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.854
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3) = 91.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 9.047(CFS)
Total initial stream area = 4.330(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 80.0

APPENDIX E

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/06/22 File:19004DEVRAT.out

19-004 DEVELOPED CONDITION RATIONAL STUDY 2 YEAR EVENT

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

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

Program License Serial Number 6106

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

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.520(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 812.300(Ft.)
Top (of initial area) elevation = 25.620(Ft.)
Bottom (of initial area) elevation = 21.150(Ft.)
Difference in elevation = 4.470(Ft.)
Slope = 0.00550 s(percent)= 0.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.385 min.
Rainfall intensity = 1.182(In/Hr) for a 2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1) = 57.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 3.817(CFS)
Total initial stream area = 3.760(Ac.)
Pervious area fraction = 0.100

++
Process from Point/Station 1.000 to Point/Station 2.000
**** CONFLUENCE OF MINOR STREAMS ****

```
____________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.760(Ac.)
Runoff from this stream =      3.817(CFS)
Time of concentration =   12.38 min.
Rainfall intensity =     1.182(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
Initial area flow distance =   406.600(Ft.)
Top (of initial area) elevation =    25.060(Ft.)
Bottom (of initial area) elevation =    20.830(Ft.)
Difference in elevation =     4.230(Ft.)
Slope =    0.01040  s(percent)=       1.04
TC = k(0.450)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.401 min.
Rainfall intensity =      1.181(In/Hr) for a     2.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.610
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.700; Impervious fraction =  0.300
Initial subarea runoff =      0.058(CFS)
Total initial stream area =        0.080(Ac.)
Pervious area fraction = 0.700


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.080(Ac.)
Runoff from this stream =      0.058(CFS)
Time of concentration =   12.40 min.
Rainfall intensity =     1.181(In/Hr)
Summary of stream data:

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


1        3.817     12.38                 1.182
2        0.058     12.40                 1.181
Largest stream flow has longer or shorter time of concentration
Qp =      3.817 + sum of
         Qa          Tb/Ta
          0.058 *    0.999 =      0.058
Qp =      3.874

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.817       0.058
Area of streams before confluence:
        3.760        0.080
Results of confluence:
Total flow rate =      3.874(CFS)
Time of concentration =    12.385 min.
Effective stream area after confluence =      3.840(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
```

```
Initial area flow distance =     69.700(Ft.)
Top (of initial area) elevation =     20.430(Ft.)
Bottom (of initial area) elevation =     19.730(Ft.)
Difference in elevation =      0.700(Ft.)
Slope =     0.01004  s(percent)=       1.00
TC = k(0.656)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =     8.991 min.
Rainfall intensity =      1.396(In/Hr) for a     2.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.523
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.088(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =     51.300(Ft.)
Top (of initial area) elevation =     23.750(Ft.)
Bottom (of initial area) elevation =     20.700(Ft.)
Difference in elevation =      3.050(Ft.)
Slope =     0.05945  s(percent)=       5.95
TC = k(-0.910)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =     5.000 min.
Rainfall intensity =      1.895(In/Hr) for a     2.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.619
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.900; Impervious fraction =  0.100
Initial subarea runoff =      0.434(CFS)
Total initial stream area =        0.370(Ac.)
Pervious area fraction = 0.900
End of computations, total study area =            4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.204
Area averaged RI index number =  75.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/06/22 File:19004DEVRAT.out

19-004 DEVELOPED CONDITION RATIONAL STUDY 5 YEAR EVENT

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

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

Program License Serial Number 6106

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

Storm event (year) = 5.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 5.0
Calculated rainfall intensity data:
1 hour intensity = 0.680(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 812.300(Ft.)
Top (of initial area) elevation = 25.620(Ft.)
Bottom (of initial area) elevation = 21.150(Ft.)
Difference in elevation = 4.470(Ft.)
Slope = 0.00550 s(percent)= 0.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.385 min.
Rainfall intensity = 1.544(In/Hr) for a 5.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1) = 57.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 5.018(CFS)
Total initial stream area = 3.760(Ac.)
Pervious area fraction = 0.100

++
Process from Point/Station 1.000 to Point/Station 2.000
**** CONFLUENCE OF MINOR STREAMS ****

```
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.760(Ac.)
Runoff from this stream =      5.018(CFS)
Time of concentration =   12.38 min.
Rainfall intensity =     1.544(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   406.600(Ft.)
Top (of initial area) elevation =    25.060(Ft.)
Bottom (of initial area) elevation =    20.830(Ft.)
Difference in elevation =     4.230(Ft.)
Slope =    0.01040  s(percent)=       1.04
TC = k(0.450)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.401 min.
Rainfall intensity =      1.543(In/Hr) for a     5.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.651
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.700; Impervious fraction =  0.300
Initial subarea runoff =      0.080(CFS)
Total initial stream area =        0.080(Ac.)
Pervious area fraction = 0.700


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.080(Ac.)
Runoff from this stream =      0.080(CFS)
Time of concentration =   12.40 min.
Rainfall intensity =     1.543(In/Hr)
Summary of stream data:

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


1        5.018     12.38                 1.544
2        0.080     12.40                 1.543
Largest stream flow has longer or shorter time of concentration
Qp =      5.018 + sum of
         Qa          Tb/Ta
          0.080 *    0.999 =      0.080
Qp =      5.098

Total of 2 streams to confluence:
Flow rates before confluence point:
       5.018       0.080
Area of streams before confluence:
        3.760        0.080
Results of confluence:
Total flow rate =      5.098(CFS)
Time of concentration =    12.385 min.
Effective stream area after confluence =      3.840(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
```

```
Initial area flow distance =    69.700(Ft.)
Top (of initial area) elevation =    20.430(Ft.)
Bottom (of initial area) elevation =    19.730(Ft.)
Difference in elevation =     0.700(Ft.)
Slope =    0.01004  s(percent)=       1.00
TC = k(0.656)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.991 min.
Rainfall intensity =      1.823(In/Hr) for a     5.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.580
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.127(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =    51.300(Ft.)
Top (of initial area) elevation =    23.750(Ft.)
Bottom (of initial area) elevation =    20.700(Ft.)
Difference in elevation =     3.050(Ft.)
Slope =    0.05945  s(percent)=       5.95
TC = k(-0.910)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.474(In/Hr) for a     5.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.666
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.900; Impervious fraction =  0.100
Initial subarea runoff =      0.610(CFS)
Total initial stream area =        0.370(Ac.)
Pervious area fraction = 0.900
End of computations, total study area =            4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.204
Area averaged RI index number =  75.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/06/22 File:19004DEVRAT.out

19-004 DEVELOPED CONDITION RATIONAL STUDY 10 YEAR EVENT

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

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

Program License Serial Number 6106

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

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

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.800(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 812.300(Ft.)
Top (of initial area) elevation = 25.620(Ft.)
Bottom (of initial area) elevation = 21.150(Ft.)
Difference in elevation = 4.470(Ft.)
Slope = 0.00550 s(percent)= 0.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.385 min.
Rainfall intensity = 1.817(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.882
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 6.029(CFS)
Total initial stream area = 3.760(Ac.)
Pervious area fraction = 0.100

++
Process from Point/Station 1.000 to Point/Station 2.000
**** CONFLUENCE OF MINOR STREAMS ****

```
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.760(Ac.)
Runoff from this stream =      6.029(CFS)
Time of concentration =   12.38 min.
Rainfall intensity =     1.817(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   406.600(Ft.)
Top (of initial area) elevation =    25.060(Ft.)
Bottom (of initial area) elevation =    20.830(Ft.)
Difference in elevation =     4.230(Ft.)
Slope =    0.01040  s(percent)=       1.04
TC = k(0.450)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.401 min.
Rainfall intensity =      1.816(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.776
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.700; Impervious fraction =  0.300
Initial subarea runoff =      0.113(CFS)
Total initial stream area =        0.080(Ac.)
Pervious area fraction = 0.700


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.080(Ac.)
Runoff from this stream =      0.113(CFS)
Time of concentration =   12.40 min.
Rainfall intensity =     1.816(In/Hr)
Summary of stream data:

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


1        6.029     12.38                 1.817
2        0.113     12.40                 1.816
Largest stream flow has longer or shorter time of concentration
Qp =      6.029 + sum of
         Qa          Tb/Ta
          0.113 *    0.999 =      0.113
Qp =      6.142

Total of 2 streams to confluence:
Flow rates before confluence point:
       6.029       0.113
Area of streams before confluence:
        3.760        0.080
Results of confluence:
Total flow rate =      6.142(CFS)
Time of concentration =    12.385 min.
Effective stream area after confluence =      3.840(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
```

```
Initial area flow distance =     69.700(Ft.)
Top (of initial area) elevation =     20.430(Ft.)
Bottom (of initial area) elevation =     19.730(Ft.)
Difference in elevation =     0.700(Ft.)
Slope =     0.01004  s(percent)=       1.00
TC = k(0.656)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =     8.991 min.
Rainfall intensity =      2.147(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.746
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.192(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =     51.300(Ft.)
Top (of initial area) elevation =     23.750(Ft.)
Bottom (of initial area) elevation =     20.700(Ft.)
Difference in elevation =     3.050(Ft.)
Slope =     0.05945  s(percent)=       5.95
TC = k(-0.910)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =     5.000 min.
Rainfall intensity =      2.912(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.793
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.900; Impervious fraction =  0.100
Initial subarea runoff =      0.854(CFS)
Total initial stream area =        0.370(Ac.)
Pervious area fraction = 0.900
End of computations, total study area =            4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.204
Area averaged RI index number =  75.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 01/06/22 File:19004DEVRAT.out

19-004 DEVELOPED CONDITION RATIONAL STUDY 100 YEAR EVENT

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

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

Program License Serial Number 6106

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 [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 812.300(Ft.)
Top (of initial area) elevation = 25.620(Ft.)
Bottom (of initial area) elevation = 21.150(Ft.)
Difference in elevation = 4.470(Ft.)
Slope = 0.00550 s(percent)= 0.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.385 min.
Rainfall intensity = 2.726(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.887
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 9.095(CFS)
Total initial stream area = 3.760(Ac.)
Pervious area fraction = 0.100

++
Process from Point/Station 1.000 to Point/Station 2.000
**** CONFLUENCE OF MINOR STREAMS ****

```
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.760(Ac.)
Runoff from this stream =      9.095(CFS)
Time of concentration =   12.38 min.
Rainfall intensity =     2.726(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   406.600(Ft.)
Top (of initial area) elevation =    25.060(Ft.)
Bottom (of initial area) elevation =    20.830(Ft.)
Difference in elevation =     4.230(Ft.)
Slope =    0.01040  s(percent)=       1.04
TC = k(0.450)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.401 min.
Rainfall intensity =      2.724(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.812
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.700; Impervious fraction =  0.300
Initial subarea runoff =      0.177(CFS)
Total initial stream area =        0.080(Ac.)
Pervious area fraction = 0.700


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        2.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.080(Ac.)
Runoff from this stream =      0.177(CFS)
Time of concentration =   12.40 min.
Rainfall intensity =     2.724(In/Hr)
Summary of stream data:

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


1        9.095     12.38                 2.726
2        0.177     12.40                 2.724
Largest stream flow has longer or shorter time of concentration
Qp =      9.095 + sum of
         Qa          Tb/Ta
          0.177 *    0.999 =      0.177
Qp =      9.272

Total of 2 streams to confluence:
Flow rates before confluence point:
       9.095       0.177
Area of streams before confluence:
        3.760        0.080
Results of confluence:
Total flow rate =      9.272(CFS)
Time of concentration =    12.385 min.
Effective stream area after confluence =      3.840(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
```

```
Initial area flow distance =    69.700(Ft.)
Top (of initial area) elevation =    20.430(Ft.)
Bottom (of initial area) elevation =    19.730(Ft.)
Difference in elevation =     0.700(Ft.)
Slope =    0.01004  s(percent)=       1.00
TC = k(0.656)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.991 min.
Rainfall intensity =      3.220(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.791
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.306(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =    51.300(Ft.)
Top (of initial area) elevation =    23.750(Ft.)
Bottom (of initial area) elevation =    20.700(Ft.)
Difference in elevation =     3.050(Ft.)
Slope =    0.05945  s(percent)=       5.95
TC = k(-0.910)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.369(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.825
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.900; Impervious fraction =  0.100
Initial subarea runoff =      1.334(CFS)
Total initial stream area =        0.370(Ac.)
Pervious area fraction = 0.900
End of computations, total study area =            4.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.204
Area averaged RI index number =  75.0
```

APPENDIX F

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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 01/04/22 File: 19004UNDEVHYD242.out

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

Program License Serial Number 6106

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

English Units used in output format

19-004 UNDEVELOPED CONDITION HYDROGRAPHY METHOD 2 YEAR 24 HOUR YEAR EVENT

Drainage Area = 4.33(Ac.) = 0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.33(Ac.) = 0.007 Sq. Mi.
Length along longest watercourse = 604.20(Ft.)
Length along longest watercourse measured to centroid = 369.00(Ft.)
Length along longest watercourse = 0.114 Mi.
Length along longest watercourse measured to centroid = 0.070 Mi.
Difference in elevation = 19.00(Ft.)
Slope along watercourse = 166.0377 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.044 Hr.
Lag time = 2.61 Min.
25% of lag time = 0.65 Min.
40% of lag time = 1.04 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.33	1.60	6.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.33	4.10	17.75

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.600(In)
Area Averaged 100-Year Rainfall = 4.100(In)

Point rain (area averaged) = 1.600(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.600(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %

4.330 80.00 0.000

Total Area Entered = 4.33(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.0	63.0	0.438	0.000	0.438	1.000	0.438
					Sum (F) =	0.438

Area averaged mean soil loss (F) (In/Hr) = 0.438

Minimum soil loss rate ((In/Hr)) = 0.219

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

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

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	191.518	41.897	1.828
2	0.167	383.035	43.964	1.918
3	0.250	574.553	9.149	0.399
4	0.333	766.070	3.628	0.158
5	0.417	957.588	1.363	0.059
			Sum = 100.000	Sum= 4.364

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.013	(0.776)	0.012	0.001
2	0.17	0.07	0.013	(0.773)	0.012	0.001
3	0.25	0.07	0.013	(0.770)	0.012	0.001
4	0.33	0.10	0.019	(0.767)	0.017	0.002
5	0.42	0.10	0.019	(0.764)	0.017	0.002
6	0.50	0.10	0.019	(0.761)	0.017	0.002
7	0.58	0.10	0.019	(0.758)	0.017	0.002
8	0.67	0.10	0.019	(0.755)	0.017	0.002
9	0.75	0.10	0.019	(0.752)	0.017	0.002
10	0.83	0.13	0.026	(0.749)	0.023	0.003
11	0.92	0.13	0.026	(0.746)	0.023	0.003
12	1.00	0.13	0.026	(0.743)	0.023	0.003
13	1.08	0.10	0.019	(0.740)	0.017	0.002
14	1.17	0.10	0.019	(0.737)	0.017	0.002
15	1.25	0.10	0.019	(0.734)	0.017	0.002
16	1.33	0.10	0.019	(0.731)	0.017	0.002
17	1.42	0.10	0.019	(0.728)	0.017	0.002
18	1.50	0.10	0.019	(0.726)	0.017	0.002
19	1.58	0.10	0.019	(0.723)	0.017	0.002
20	1.67	0.10	0.019	(0.720)	0.017	0.002
21	1.75	0.10	0.019	(0.717)	0.017	0.002
22	1.83	0.13	0.026	(0.714)	0.023	0.003
23	1.92	0.13	0.026	(0.711)	0.023	0.003
24	2.00	0.13	0.026	(0.708)	0.023	0.003
25	2.08	0.13	0.026	(0.705)	0.023	0.003
26	2.17	0.13	0.026	(0.702)	0.023	0.003
27	2.25	0.13	0.026	(0.700)	0.023	0.003
28	2.33	0.13	0.026	(0.697)	0.023	0.003
29	2.42	0.13	0.026	(0.694)	0.023	0.003
30	2.50	0.13	0.026	(0.691)	0.023	0.003
31	2.58	0.17	0.032	(0.688)	0.029	0.003
32	2.67	0.17	0.032	(0.685)	0.029	0.003
33	2.75	0.17	0.032	(0.683)	0.029	0.003
34	2.83	0.17	0.032	(0.680)	0.029	0.003
35	2.92	0.17	0.032	(0.677)	0.029	0.003

36	3.00	0.17	0.032	(0.674)	0.029	0.003
37	3.08	0.17	0.032	(0.671)	0.029	0.003
38	3.17	0.17	0.032	(0.669)	0.029	0.003
39	3.25	0.17	0.032	(0.666)	0.029	0.003
40	3.33	0.17	0.032	(0.663)	0.029	0.003
41	3.42	0.17	0.032	(0.660)	0.029	0.003
42	3.50	0.17	0.032	(0.658)	0.029	0.003
43	3.58	0.17	0.032	(0.655)	0.029	0.003
44	3.67	0.17	0.032	(0.652)	0.029	0.003
45	3.75	0.17	0.032	(0.649)	0.029	0.003
46	3.83	0.20	0.038	(0.647)	0.035	0.004
47	3.92	0.20	0.038	(0.644)	0.035	0.004
48	4.00	0.20	0.038	(0.641)	0.035	0.004
49	4.08	0.20	0.038	(0.638)	0.035	0.004
50	4.17	0.20	0.038	(0.636)	0.035	0.004
51	4.25	0.20	0.038	(0.633)	0.035	0.004
52	4.33	0.23	0.045	(0.630)	0.040	0.004
53	4.42	0.23	0.045	(0.628)	0.040	0.004
54	4.50	0.23	0.045	(0.625)	0.040	0.004
55	4.58	0.23	0.045	(0.622)	0.040	0.004
56	4.67	0.23	0.045	(0.620)	0.040	0.004
57	4.75	0.23	0.045	(0.617)	0.040	0.004
58	4.83	0.27	0.051	(0.614)	0.046	0.005
59	4.92	0.27	0.051	(0.612)	0.046	0.005
60	5.00	0.27	0.051	(0.609)	0.046	0.005
61	5.08	0.20	0.038	(0.606)	0.035	0.004
62	5.17	0.20	0.038	(0.604)	0.035	0.004
63	5.25	0.20	0.038	(0.601)	0.035	0.004
64	5.33	0.23	0.045	(0.598)	0.040	0.004
65	5.42	0.23	0.045	(0.596)	0.040	0.004
66	5.50	0.23	0.045	(0.593)	0.040	0.004
67	5.58	0.27	0.051	(0.591)	0.046	0.005
68	5.67	0.27	0.051	(0.588)	0.046	0.005
69	5.75	0.27	0.051	(0.585)	0.046	0.005
70	5.83	0.27	0.051	(0.583)	0.046	0.005
71	5.92	0.27	0.051	(0.580)	0.046	0.005
72	6.00	0.27	0.051	(0.578)	0.046	0.005
73	6.08	0.30	0.058	(0.575)	0.052	0.006
74	6.17	0.30	0.058	(0.572)	0.052	0.006
75	6.25	0.30	0.058	(0.570)	0.052	0.006
76	6.33	0.30	0.058	(0.567)	0.052	0.006
77	6.42	0.30	0.058	(0.565)	0.052	0.006
78	6.50	0.30	0.058	(0.562)	0.052	0.006
79	6.58	0.33	0.064	(0.560)	0.058	0.006
80	6.67	0.33	0.064	(0.557)	0.058	0.006
81	6.75	0.33	0.064	(0.555)	0.058	0.006
82	6.83	0.33	0.064	(0.552)	0.058	0.006
83	6.92	0.33	0.064	(0.550)	0.058	0.006
84	7.00	0.33	0.064	(0.547)	0.058	0.006
85	7.08	0.33	0.064	(0.545)	0.058	0.006
86	7.17	0.33	0.064	(0.542)	0.058	0.006
87	7.25	0.33	0.064	(0.540)	0.058	0.006
88	7.33	0.37	0.070	(0.537)	0.063	0.007
89	7.42	0.37	0.070	(0.535)	0.063	0.007
90	7.50	0.37	0.070	(0.532)	0.063	0.007
91	7.58	0.40	0.077	(0.530)	0.069	0.008
92	7.67	0.40	0.077	(0.528)	0.069	0.008
93	7.75	0.40	0.077	(0.525)	0.069	0.008
94	7.83	0.43	0.083	(0.523)	0.075	0.008
95	7.92	0.43	0.083	(0.520)	0.075	0.008
96	8.00	0.43	0.083	(0.518)	0.075	0.008
97	8.08	0.50	0.096	(0.515)	0.086	0.010
98	8.17	0.50	0.096	(0.513)	0.086	0.010
99	8.25	0.50	0.096	(0.511)	0.086	0.010
100	8.33	0.50	0.096	(0.508)	0.086	0.010
101	8.42	0.50	0.096	(0.506)	0.086	0.010
102	8.50	0.50	0.096	(0.504)	0.086	0.010
103	8.58	0.53	0.102	(0.501)	0.092	0.010
104	8.67	0.53	0.102	(0.499)	0.092	0.010
105	8.75	0.53	0.102	(0.496)	0.092	0.010
106	8.83	0.57	0.109	(0.494)	0.098	0.011

107	8.92	0.57	0.109	(0.492)	0.098	0.011
108	9.00	0.57	0.109	(0.489)	0.098	0.011
109	9.08	0.63	0.122	(0.487)	0.109	0.012
110	9.17	0.63	0.122	(0.485)	0.109	0.012
111	9.25	0.63	0.122	(0.483)	0.109	0.012
112	9.33	0.67	0.128	(0.480)	0.115	0.013
113	9.42	0.67	0.128	(0.478)	0.115	0.013
114	9.50	0.67	0.128	(0.476)	0.115	0.013
115	9.58	0.70	0.134	(0.473)	0.121	0.013
116	9.67	0.70	0.134	(0.471)	0.121	0.013
117	9.75	0.70	0.134	(0.469)	0.121	0.013
118	9.83	0.73	0.141	(0.467)	0.127	0.014
119	9.92	0.73	0.141	(0.464)	0.127	0.014
120	10.00	0.73	0.141	(0.462)	0.127	0.014
121	10.08	0.50	0.096	(0.460)	0.086	0.010
122	10.17	0.50	0.096	(0.458)	0.086	0.010
123	10.25	0.50	0.096	(0.455)	0.086	0.010
124	10.33	0.50	0.096	(0.453)	0.086	0.010
125	10.42	0.50	0.096	(0.451)	0.086	0.010
126	10.50	0.50	0.096	(0.449)	0.086	0.010
127	10.58	0.67	0.128	(0.447)	0.115	0.013
128	10.67	0.67	0.128	(0.444)	0.115	0.013
129	10.75	0.67	0.128	(0.442)	0.115	0.013
130	10.83	0.67	0.128	(0.440)	0.115	0.013
131	10.92	0.67	0.128	(0.438)	0.115	0.013
132	11.00	0.67	0.128	(0.436)	0.115	0.013
133	11.08	0.63	0.122	(0.434)	0.109	0.012
134	11.17	0.63	0.122	(0.431)	0.109	0.012
135	11.25	0.63	0.122	(0.429)	0.109	0.012
136	11.33	0.63	0.122	(0.427)	0.109	0.012
137	11.42	0.63	0.122	(0.425)	0.109	0.012
138	11.50	0.63	0.122	(0.423)	0.109	0.012
139	11.58	0.57	0.109	(0.421)	0.098	0.011
140	11.67	0.57	0.109	(0.419)	0.098	0.011
141	11.75	0.57	0.109	(0.417)	0.098	0.011
142	11.83	0.60	0.115	(0.415)	0.104	0.012
143	11.92	0.60	0.115	(0.413)	0.104	0.012
144	12.00	0.60	0.115	(0.411)	0.104	0.012
145	12.08	0.83	0.160	(0.408)	0.144	0.016
146	12.17	0.83	0.160	(0.406)	0.144	0.016
147	12.25	0.83	0.160	(0.404)	0.144	0.016
148	12.33	0.87	0.166	(0.402)	0.150	0.017
149	12.42	0.87	0.166	(0.400)	0.150	0.017
150	12.50	0.87	0.166	(0.398)	0.150	0.017
151	12.58	0.93	0.179	(0.396)	0.161	0.018
152	12.67	0.93	0.179	(0.394)	0.161	0.018
153	12.75	0.93	0.179	(0.392)	0.161	0.018
154	12.83	0.97	0.186	(0.390)	0.167	0.019
155	12.92	0.97	0.186	(0.388)	0.167	0.019
156	13.00	0.97	0.186	(0.386)	0.167	0.019
157	13.08	1.13	0.218	(0.384)	0.196	0.022
158	13.17	1.13	0.218	(0.383)	0.196	0.022
159	13.25	1.13	0.218	(0.381)	0.196	0.022
160	13.33	1.13	0.218	(0.379)	0.196	0.022
161	13.42	1.13	0.218	(0.377)	0.196	0.022
162	13.50	1.13	0.218	(0.375)	0.196	0.022
163	13.58	0.77	0.147	(0.373)	0.132	0.015
164	13.67	0.77	0.147	(0.371)	0.132	0.015
165	13.75	0.77	0.147	(0.369)	0.132	0.015
166	13.83	0.77	0.147	(0.367)	0.132	0.015
167	13.92	0.77	0.147	(0.365)	0.132	0.015
168	14.00	0.77	0.147	(0.363)	0.132	0.015
169	14.08	0.90	0.173	(0.362)	0.156	0.017
170	14.17	0.90	0.173	(0.360)	0.156	0.017
171	14.25	0.90	0.173	(0.358)	0.156	0.017
172	14.33	0.87	0.166	(0.356)	0.150	0.017
173	14.42	0.87	0.166	(0.354)	0.150	0.017
174	14.50	0.87	0.166	(0.352)	0.150	0.017
175	14.58	0.87	0.166	(0.351)	0.150	0.017
176	14.67	0.87	0.166	(0.349)	0.150	0.017
177	14.75	0.87	0.166	(0.347)	0.150	0.017

178	14.83	0.83	0.160	(0.345)	0.144	0.016
179	14.92	0.83	0.160	(0.344)	0.144	0.016
180	15.00	0.83	0.160	(0.342)	0.144	0.016
181	15.08	0.80	0.154	(0.340)	0.138	0.015
182	15.17	0.80	0.154	(0.338)	0.138	0.015
183	15.25	0.80	0.154	(0.337)	0.138	0.015
184	15.33	0.77	0.147	(0.335)	0.132	0.015
185	15.42	0.77	0.147	(0.333)	0.132	0.015
186	15.50	0.77	0.147	(0.331)	0.132	0.015
187	15.58	0.63	0.122	(0.330)	0.109	0.012
188	15.67	0.63	0.122	(0.328)	0.109	0.012
189	15.75	0.63	0.122	(0.326)	0.109	0.012
190	15.83	0.63	0.122	(0.325)	0.109	0.012
191	15.92	0.63	0.122	(0.323)	0.109	0.012
192	16.00	0.63	0.122	(0.321)	0.109	0.012
193	16.08	0.13	0.026	(0.320)	0.023	0.003
194	16.17	0.13	0.026	(0.318)	0.023	0.003
195	16.25	0.13	0.026	(0.316)	0.023	0.003
196	16.33	0.13	0.026	(0.315)	0.023	0.003
197	16.42	0.13	0.026	(0.313)	0.023	0.003
198	16.50	0.13	0.026	(0.312)	0.023	0.003
199	16.58	0.10	0.019	(0.310)	0.017	0.002
200	16.67	0.10	0.019	(0.308)	0.017	0.002
201	16.75	0.10	0.019	(0.307)	0.017	0.002
202	16.83	0.10	0.019	(0.305)	0.017	0.002
203	16.92	0.10	0.019	(0.304)	0.017	0.002
204	17.00	0.10	0.019	(0.302)	0.017	0.002
205	17.08	0.17	0.032	(0.301)	0.029	0.003
206	17.17	0.17	0.032	(0.299)	0.029	0.003
207	17.25	0.17	0.032	(0.298)	0.029	0.003
208	17.33	0.17	0.032	(0.296)	0.029	0.003
209	17.42	0.17	0.032	(0.295)	0.029	0.003
210	17.50	0.17	0.032	(0.293)	0.029	0.003
211	17.58	0.17	0.032	(0.292)	0.029	0.003
212	17.67	0.17	0.032	(0.290)	0.029	0.003
213	17.75	0.17	0.032	(0.289)	0.029	0.003
214	17.83	0.13	0.026	(0.287)	0.023	0.003
215	17.92	0.13	0.026	(0.286)	0.023	0.003
216	18.00	0.13	0.026	(0.285)	0.023	0.003
217	18.08	0.13	0.026	(0.283)	0.023	0.003
218	18.17	0.13	0.026	(0.282)	0.023	0.003
219	18.25	0.13	0.026	(0.280)	0.023	0.003
220	18.33	0.13	0.026	(0.279)	0.023	0.003
221	18.42	0.13	0.026	(0.278)	0.023	0.003
222	18.50	0.13	0.026	(0.276)	0.023	0.003
223	18.58	0.10	0.019	(0.275)	0.017	0.002
224	18.67	0.10	0.019	(0.274)	0.017	0.002
225	18.75	0.10	0.019	(0.272)	0.017	0.002
226	18.83	0.07	0.013	(0.271)	0.012	0.001
227	18.92	0.07	0.013	(0.270)	0.012	0.001
228	19.00	0.07	0.013	(0.269)	0.012	0.001
229	19.08	0.10	0.019	(0.267)	0.017	0.002
230	19.17	0.10	0.019	(0.266)	0.017	0.002
231	19.25	0.10	0.019	(0.265)	0.017	0.002
232	19.33	0.13	0.026	(0.264)	0.023	0.003
233	19.42	0.13	0.026	(0.262)	0.023	0.003
234	19.50	0.13	0.026	(0.261)	0.023	0.003
235	19.58	0.10	0.019	(0.260)	0.017	0.002
236	19.67	0.10	0.019	(0.259)	0.017	0.002
237	19.75	0.10	0.019	(0.258)	0.017	0.002
238	19.83	0.07	0.013	(0.256)	0.012	0.001
239	19.92	0.07	0.013	(0.255)	0.012	0.001
240	20.00	0.07	0.013	(0.254)	0.012	0.001
241	20.08	0.10	0.019	(0.253)	0.017	0.002
242	20.17	0.10	0.019	(0.252)	0.017	0.002
243	20.25	0.10	0.019	(0.251)	0.017	0.002
244	20.33	0.10	0.019	(0.250)	0.017	0.002
245	20.42	0.10	0.019	(0.249)	0.017	0.002
246	20.50	0.10	0.019	(0.248)	0.017	0.002
247	20.58	0.10	0.019	(0.247)	0.017	0.002
248	20.67	0.10	0.019	(0.245)	0.017	0.002

249	20.75	0.10	0.019	(0.244)	0.017	0.002
250	20.83	0.07	0.013	(0.243)	0.012	0.001
251	20.92	0.07	0.013	(0.242)	0.012	0.001
252	21.00	0.07	0.013	(0.242)	0.012	0.001
253	21.08	0.10	0.019	(0.241)	0.017	0.002
254	21.17	0.10	0.019	(0.240)	0.017	0.002
255	21.25	0.10	0.019	(0.239)	0.017	0.002
256	21.33	0.07	0.013	(0.238)	0.012	0.001
257	21.42	0.07	0.013	(0.237)	0.012	0.001
258	21.50	0.07	0.013	(0.236)	0.012	0.001
259	21.58	0.10	0.019	(0.235)	0.017	0.002
260	21.67	0.10	0.019	(0.234)	0.017	0.002
261	21.75	0.10	0.019	(0.233)	0.017	0.002
262	21.83	0.07	0.013	(0.233)	0.012	0.001
263	21.92	0.07	0.013	(0.232)	0.012	0.001
264	22.00	0.07	0.013	(0.231)	0.012	0.001
265	22.08	0.10	0.019	(0.230)	0.017	0.002
266	22.17	0.10	0.019	(0.230)	0.017	0.002
267	22.25	0.10	0.019	(0.229)	0.017	0.002
268	22.33	0.07	0.013	(0.228)	0.012	0.001
269	22.42	0.07	0.013	(0.227)	0.012	0.001
270	22.50	0.07	0.013	(0.227)	0.012	0.001
271	22.58	0.07	0.013	(0.226)	0.012	0.001
272	22.67	0.07	0.013	(0.225)	0.012	0.001
273	22.75	0.07	0.013	(0.225)	0.012	0.001
274	22.83	0.07	0.013	(0.224)	0.012	0.001
275	22.92	0.07	0.013	(0.224)	0.012	0.001
276	23.00	0.07	0.013	(0.223)	0.012	0.001
277	23.08	0.07	0.013	(0.223)	0.012	0.001
278	23.17	0.07	0.013	(0.222)	0.012	0.001
279	23.25	0.07	0.013	(0.222)	0.012	0.001
280	23.33	0.07	0.013	(0.221)	0.012	0.001
281	23.42	0.07	0.013	(0.221)	0.012	0.001
282	23.50	0.07	0.013	(0.220)	0.012	0.001
283	23.58	0.07	0.013	(0.220)	0.012	0.001
284	23.67	0.07	0.013	(0.220)	0.012	0.001
285	23.75	0.07	0.013	(0.219)	0.012	0.001
286	23.83	0.07	0.013	(0.219)	0.012	0.001
287	23.92	0.07	0.013	(0.219)	0.012	0.001
288	24.00	0.07	0.013	(0.219)	0.012	0.001

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.9

Flood volume = Effective rainfall 0.16(In)
times area 4.3(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)
Total soil loss = 1.44(In)
Total soil loss = 0.520(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 2514.8 Cubic Feet
Total soil loss = 22633.6 Cubic Feet

Peak flow rate of this hydrograph = 0.095(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	0.00	Q	|	|	|	|
0+10	0.0000	0.00	Q	|	|	|	|
0+15	0.0001	0.01	Q	|	|	|	|
0+20	0.0001	0.01	Q	|	|	|	|
0+25	0.0002	0.01	Q	|	|	|	|
0+30	0.0002	0.01	Q	|	|	|	|
0+35	0.0003	0.01	Q	|	|	|	|
0+40	0.0004	0.01	Q	|	|	|	|
0+45	0.0004	0.01	Q	|	|	|	|
0+50	0.0005	0.01	Q	|	|	|	|

0+55	0.0006	0.01	Q	|	|	|	|
1+ 0	0.0006	0.01	Q	|	|	|	|
1+ 5	0.0007	0.01	Q	|	|	|	|
1+10	0.0008	0.01	Q	|	|	|	|
1+15	0.0008	0.01	Q	|	|	|	|
1+20	0.0009	0.01	Q	|	|	|	|
1+25	0.0009	0.01	Q	|	|	|	|
1+30	0.0010	0.01	Q	|	|	|	|
1+35	0.0011	0.01	Q	|	|	|	|
1+40	0.0011	0.01	Q	|	|	|	|
1+45	0.0012	0.01	Q	|	|	|	|
1+50	0.0012	0.01	Q	|	|	|	|
1+55	0.0013	0.01	Q	|	|	|	|
2+ 0	0.0014	0.01	Q	|	|	|	|
2+ 5	0.0015	0.01	QV	|	|	|	|
2+10	0.0015	0.01	QV	|	|	|	|
2+15	0.0016	0.01	QV	|	|	|	|
2+20	0.0017	0.01	QV	|	|	|	|
2+25	0.0018	0.01	QV	|	|	|	|
2+30	0.0018	0.01	QV	|	|	|	|
2+35	0.0019	0.01	QV	|	|	|	|
2+40	0.0020	0.01	QV	|	|	|	|
2+45	0.0021	0.01	QV	|	|	|	|
2+50	0.0022	0.01	QV	|	|	|	|
2+55	0.0023	0.01	QV	|	|	|	|
3+ 0	0.0024	0.01	QV	|	|	|	|
3+ 5	0.0025	0.01	QV	|	|	|	|
3+10	0.0026	0.01	QV	|	|	|	|
3+15	0.0027	0.01	QV	|	|	|	|
3+20	0.0028	0.01	QV	|	|	|	|
3+25	0.0029	0.01	Q V	|	|	|	|
3+30	0.0030	0.01	Q V	|	|	|	|
3+35	0.0031	0.01	Q V	|	|	|	|
3+40	0.0032	0.01	Q V	|	|	|	|
3+45	0.0033	0.01	Q V	|	|	|	|
3+50	0.0034	0.02	Q V	|	|	|	|
3+55	0.0035	0.02	Q V	|	|	|	|
4+ 0	0.0036	0.02	Q V	|	|	|	|
4+ 5	0.0037	0.02	Q V	|	|	|	|
4+10	0.0038	0.02	Q V	|	|	|	|
4+15	0.0040	0.02	Q V	|	|	|	|
4+20	0.0041	0.02	Q V	|	|	|	|
4+25	0.0042	0.02	Q V	|	|	|	|
4+30	0.0043	0.02	Q V	|	|	|	|
4+35	0.0045	0.02	Q V	|	|	|	|
4+40	0.0046	0.02	Q V	|	|	|	|
4+45	0.0047	0.02	Q V	|	|	|	|
4+50	0.0049	0.02	Q V	|	|	|	|
4+55	0.0050	0.02	Q V	|	|	|	|
5+ 0	0.0052	0.02	Q V	|	|	|	|
5+ 5	0.0053	0.02	Q V	|	|	|	|
5+10	0.0054	0.02	Q V	|	|	|	|
5+15	0.0056	0.02	Q V	|	|	|	|
5+20	0.0057	0.02	Q V	|	|	|	|
5+25	0.0058	0.02	Q V	|	|	|	|
5+30	0.0060	0.02	Q V	|	|	|	|
5+35	0.0061	0.02	Q V	|	|	|	|
5+40	0.0063	0.02	Q V	|	|	|	|
5+45	0.0064	0.02	Q V	|	|	|	|
5+50	0.0066	0.02	Q V	|	|	|	|
5+55	0.0067	0.02	Q V	|	|	|	|
6+ 0	0.0069	0.02	Q V	|	|	|	|
6+ 5	0.0070	0.02	Q V	|	|	|	|
6+10	0.0072	0.02	Q V	|	|	|	|
6+15	0.0074	0.03	Q V	|	|	|	|
6+20	0.0075	0.03	Q V	|	|	|	|
6+25	0.0077	0.03	Q V	|	|	|	|
6+30	0.0079	0.03	Q V	|	|	|	|
6+35	0.0081	0.03	Q V	|	|	|	|
6+40	0.0083	0.03	Q V	|	|	|	|
6+45	0.0085	0.03	Q V	|	|	|	|

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 6+50       0.0086       0.03  Q    V    |          |          |          |
 6+55       0.0088       0.03  Q     V   |          |          |          |
 7+ 0       0.0090       0.03  Q     V   |          |          |          |
 7+ 5       0.0092       0.03  Q     V   |          |          |          |
 7+10       0.0094       0.03  Q     V   |          |          |          |
 7+15       0.0096       0.03  Q     V   |          |          |          |
 7+20       0.0098       0.03  Q     V   |          |          |          |
 7+25       0.0100       0.03  Q     V   |          |          |          |
 7+30       0.0102       0.03  Q      V  |          |          |          |
 7+35       0.0104       0.03  Q      V  |          |          |          |
 7+40       0.0107       0.03  Q      V  |          |          |          |
 7+45       0.0109       0.03  Q      V  |          |          |          |
 7+50       0.0111       0.03  Q      V  |          |          |          |
 7+55       0.0114       0.04  Q      V  |          |          |          |
 8+ 0       0.0116       0.04  Q       V |          |          |          |
 8+ 5       0.0119       0.04  Q       V |          |          |          |
 8+10       0.0122       0.04  Q       V |          |          |          |
 8+15       0.0125       0.04  Q       V |          |          |          |
 8+20       0.0128       0.04  Q       V |          |          |          |
 8+25       0.0131       0.04  Q        V|          |          |          |
 8+30       0.0133       0.04  Q        V|          |          |          |
 8+35       0.0136       0.04  Q        V|          |          |          |
 8+40       0.0139       0.04  Q        V|          |          |          |
 8+45       0.0142       0.04  Q        V|          |          |          |
 8+50       0.0146       0.05  Q         V          |          |          |
 8+55       0.0149       0.05  Q         V          |          |          |
 9+ 0       0.0152       0.05  Q         V          |          |          |
 9+ 5       0.0156       0.05  Q         V          |          |          |
 9+10       0.0159       0.05  Q         |V         |          |          |
 9+15       0.0163       0.05  Q         |V         |          |          |
 9+20       0.0167       0.05  Q         |V         |          |          |
 9+25       0.0170       0.06  Q         |V         |          |          |
 9+30       0.0174       0.06  Q         | V        |          |          |
 9+35       0.0178       0.06  Q         | V        |          |          |
 9+40       0.0182       0.06  Q         | V        |          |          |
 9+45       0.0186       0.06  Q         | V        |          |          |
 9+50       0.0190       0.06  Q         |  V       |          |          |
 9+55       0.0195       0.06  Q         |  V       |          |          |
10+ 0       0.0199       0.06  Q         |  V       |          |          |
10+ 5       0.0202       0.05  Q         |   V      |          |          |
10+10       0.0205       0.04  Q         |   V      |          |          |
10+15       0.0208       0.04  Q         |   V      |          |          |
10+20       0.0211       0.04  Q         |   V      |          |          |
10+25       0.0214       0.04  Q         |   V      |          |          |
10+30       0.0217       0.04  Q         |    V     |          |          |
10+35       0.0220       0.05  Q         |    V     |          |          |
10+40       0.0224       0.05  Q         |    V     |          |          |
10+45       0.0228       0.06  Q         |    V     |          |          |
10+50       0.0232       0.06  Q         |     V    |          |          |
10+55       0.0236       0.06  Q         |     V    |          |          |
11+ 0       0.0239       0.06  Q         |     V    |          |          |
11+ 5       0.0243       0.05  Q         |     V    |          |          |
11+10       0.0247       0.05  Q         |      V   |          |          |
11+15       0.0251       0.05  Q         |      V   |          |          |
11+20       0.0254       0.05  Q         |      V   |          |          |
11+25       0.0258       0.05  Q         |      V   |          |          |
11+30       0.0262       0.05  Q         |       V  |          |          |
11+35       0.0265       0.05  Q         |       V  |          |          |
11+40       0.0268       0.05  Q         |       V  |          |          |
11+45       0.0272       0.05  Q         |       V  |          |          |
11+50       0.0275       0.05  Q         |        V|          |          |
11+55       0.0278       0.05  Q         |        V|          |          |
12+ 0       0.0282       0.05  Q         |        V|          |          |
12+ 5       0.0286       0.06  Q         |        V|          |          |
12+10       0.0291       0.07  Q         |         V          |          |
12+15       0.0295       0.07  Q         |         V          |          |
12+20       0.0300       0.07  Q         |         V          |          |
12+25       0.0305       0.07  Q         |         |V         |          |
12+30       0.0310       0.07  Q         |         |V         |          |
12+35       0.0315       0.07  Q         |         |V         |          |
12+40       0.0321       0.08  Q         |         | V        |          |
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12+45      0.0326      0.08  Q          |          | V        |          |
12+50      0.0331      0.08  Q          |          | V        |          |
12+55      0.0337      0.08  Q          |          |  V       |          |
13+ 0      0.0343      0.08  Q          |          |  V       |          |
13+ 5      0.0349      0.09  Q          |          |   V      |          |
13+10      0.0355      0.09  Q          |          |   V      |          |
13+15      0.0361      0.09  Q          |          |    V     |          |
13+20      0.0368      0.09  Q          |          |    V     |          |
13+25      0.0375      0.10  Q          |          |    V     |          |
13+30      0.0381      0.10  Q          |          |     V    |          |
13+35      0.0387      0.08  Q          |          |     V    |          |
13+40      0.0391      0.07  Q          |          |      V   |          |
13+45      0.0396      0.07  Q          |          |      V   |          |
13+50      0.0400      0.06  Q          |          |      V   |          |
13+55      0.0405      0.06  Q          |          |       V  |          |
14+ 0      0.0409      0.06  Q          |          |       V  |          |
14+ 5      0.0414      0.07  Q          |          |       V  |          |
14+10      0.0419      0.07  Q          |          |        V|          |
14+15      0.0424      0.07  Q          |          |        V|          |
14+20      0.0429      0.07  Q          |          |        V|          |
14+25      0.0434      0.07  Q          |          |         V          |
14+30      0.0439      0.07  Q          |          |         V          |
14+35      0.0444      0.07  Q          |          |         V          |
14+40      0.0449      0.07  Q          |          |         |V         |
14+45      0.0454      0.07  Q          |          |         |V         |
14+50      0.0459      0.07  Q          |          |         |V         |
14+55      0.0464      0.07  Q          |          |         | V        |
15+ 0      0.0469      0.07  Q          |          |         | V        |
15+ 5      0.0474      0.07  Q          |          |         | V        |
15+10      0.0478      0.07  Q          |          |         |  V       |
15+15      0.0483      0.07  Q          |          |         |  V       |
15+20      0.0488      0.07  Q          |          |         |  V       |
15+25      0.0492      0.06  Q          |          |         |   V      |
15+30      0.0496      0.06  Q          |          |         |   V      |
15+35      0.0501      0.06  Q          |          |         |   V      |
15+40      0.0504      0.05  Q          |          |         |   V      |
15+45      0.0508      0.05  Q          |          |         |    V     |
15+50      0.0512      0.05  Q          |          |         |    V     |
15+55      0.0515      0.05  Q          |          |         |    V     |
16+ 0      0.0519      0.05  Q          |          |         |    V     |
16+ 5      0.0521      0.04  Q          |          |         |     V    |
16+10      0.0523      0.02  Q          |          |         |     V    |
16+15      0.0524      0.01  Q          |          |         |     V    |
16+20      0.0524      0.01  Q          |          |         |     V    |
16+25      0.0525      0.01  Q          |          |         |     V    |
16+30      0.0526      0.01  Q          |          |         |     V    |
16+35      0.0527      0.01  Q          |          |         |     V    |
16+40      0.0527      0.01  Q          |          |         |     V    |
16+45      0.0528      0.01  Q          |          |         |     V    |
16+50      0.0528      0.01  Q          |          |         |     V    |
16+55      0.0529      0.01  Q          |          |         |     V    |
17+ 0      0.0530      0.01  Q          |          |         |     V    |
17+ 5      0.0530      0.01  Q          |          |         |     V    |
17+10      0.0531      0.01  Q          |          |         |     V    |
17+15      0.0532      0.01  Q          |          |         |     V    |
17+20      0.0533      0.01  Q          |          |         |     V    |
17+25      0.0534      0.01  Q          |          |         |      V   |
17+30      0.0535      0.01  Q          |          |         |      V   |
17+35      0.0536      0.01  Q          |          |         |      V   |
17+40      0.0537      0.01  Q          |          |         |      V   |
17+45      0.0538      0.01  Q          |          |         |      V   |
17+50      0.0539      0.01  Q          |          |         |      V   |
17+55      0.0540      0.01  Q          |          |         |      V   |
18+ 0      0.0540      0.01  Q          |          |         |      V   |
18+ 5      0.0541      0.01  Q          |          |         |      V   |
18+10      0.0542      0.01  Q          |          |         |      V   |
18+15      0.0543      0.01  Q          |          |         |      V   |
18+20      0.0543      0.01  Q          |          |         |      V   |
18+25      0.0544      0.01  Q          |          |         |      V   |
18+30      0.0545      0.01  Q          |          |         |      V   |
18+35      0.0546      0.01  Q          |          |         |      V   |
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  18+40       0.0546      0.01  Q          |          |          |       V  |
  18+45       0.0547      0.01  Q          |          |          |       V  |
  18+50       0.0547      0.01  Q          |          |          |       V  |
  18+55       0.0548      0.01  Q          |          |          |       V  |
  19+ 0       0.0548      0.01  Q          |          |          |       V  |
  19+ 5       0.0549      0.01  Q          |          |          |        V |
  19+10       0.0549      0.01  Q          |          |          |        V |
  19+15       0.0550      0.01  Q          |          |          |        V |
  19+20       0.0550      0.01  Q          |          |          |        V |
  19+25       0.0551      0.01  Q          |          |          |        V |
  19+30       0.0552      0.01  Q          |          |          |        V |
  19+35       0.0553      0.01  Q          |          |          |        V |
  19+40       0.0553      0.01  Q          |          |          |        V |
  19+45       0.0554      0.01  Q          |          |          |        V |
  19+50       0.0554      0.01  Q          |          |          |        V |
  19+55       0.0555      0.01  Q          |          |          |        V |
  20+ 0       0.0555      0.01  Q          |          |          |        V |
  20+ 5       0.0556      0.01  Q          |          |          |        V |
  20+10       0.0556      0.01  Q          |          |          |        V |
  20+15       0.0557      0.01  Q          |          |          |        V |
  20+20       0.0557      0.01  Q          |          |          |        V |
  20+25       0.0558      0.01  Q          |          |          |        V |
  20+30       0.0558      0.01  Q          |          |          |        V |
  20+35       0.0559      0.01  Q          |          |          |        V |
  20+40       0.0560      0.01  Q          |          |          |        V |
  20+45       0.0560      0.01  Q          |          |          |        V |
  20+50       0.0561      0.01  Q          |          |          |        V |
  20+55       0.0561      0.01  Q          |          |          |        V |
  21+ 0       0.0561      0.01  Q          |          |          |        V |
  21+ 5       0.0562      0.01  Q          |          |          |        V |
  21+10       0.0562      0.01  Q          |          |          |        V |
  21+15       0.0563      0.01  Q          |          |          |         V|
  21+20       0.0564      0.01  Q          |          |          |         V|
  21+25       0.0564      0.01  Q          |          |          |         V|
  21+30       0.0564      0.01  Q          |          |          |         V|
  21+35       0.0565      0.01  Q          |          |          |         V|
  21+40       0.0565      0.01  Q          |          |          |         V|
  21+45       0.0566      0.01  Q          |          |          |         V|
  21+50       0.0566      0.01  Q          |          |          |         V|
  21+55       0.0567      0.01  Q          |          |          |         V|
  22+ 0       0.0567      0.01  Q          |          |          |         V|
  22+ 5       0.0568      0.01  Q          |          |          |         V|
  22+10       0.0568      0.01  Q          |          |          |         V|
  22+15       0.0569      0.01  Q          |          |          |         V|
  22+20       0.0569      0.01  Q          |          |          |         V|
  22+25       0.0570      0.01  Q          |          |          |         V|
  22+30       0.0570      0.01  Q          |          |          |         V|
  22+35       0.0570      0.01  Q          |          |          |         V|
  22+40       0.0571      0.01  Q          |          |          |         V|
  22+45       0.0571      0.01  Q          |          |          |         V|
  22+50       0.0572      0.01  Q          |          |          |         V|
  22+55       0.0572      0.01  Q          |          |          |         V|
  23+ 0       0.0572      0.01  Q          |          |          |         V|
  23+ 5       0.0573      0.01  Q          |          |          |         V|
  23+10       0.0573      0.01  Q          |          |          |         V|
  23+15       0.0574      0.01  Q          |          |          |         V|
  23+20       0.0574      0.01  Q          |          |          |         V|
  23+25       0.0574      0.01  Q          |          |          |         V|
  23+30       0.0575      0.01  Q          |          |          |         V|
  23+35       0.0575      0.01  Q          |          |          |         V|
  23+40       0.0575      0.01  Q          |          |          |         V|
  23+45       0.0576      0.01  Q          |          |          |         V|
  23+50       0.0576      0.01  Q          |          |          |         V|
  23+55       0.0577      0.01  Q          |          |          |         V|
  24+ 0       0.0577      0.01  Q          |          |          |         V|
  24+ 5       0.0577      0.00  Q          |          |          |         V|
  24+10       0.0577      0.00  Q          |          |          |         V|
  24+15       0.0577      0.00  Q          |          |          |         V|
  24+20       0.0577      0.00  Q          |          |          |         V|
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        U n i t   H y d r o g r a p h   A n a l y s i s

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  01/04/22 File: 19004UNDEVHYD2410.out

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


Program License Serial Number 6106

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

 English Units used in output format


--------------------------------------------------------------------
```

19-004 UNDEVELOPED CONDITION HYDROGRAPHY METHOD 10 YEAR 24 HOUR EVENT

```
--------------------------------------------------------------------
Drainage Area =       4.33(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.33(Ac.)  =      0.007 Sq. Mi.
Length along longest watercourse =     604.20(Ft.)
Length along longest watercourse measured to centroid =     369.00(Ft.)
Length along longest watercourse =      0.114 Mi.
Length along longest watercourse measured to centroid =      0.070 Mi.
Difference in elevation =      19.00(Ft.)
Slope along watercourse =    166.0377 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.044 Hr.
Lag time =     2.61 Min.
25% of lag time =     0.65 Min.
40% of lag time =     1.04 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]        Rainfall(In)[2]      Weighting[1*2]
        4.33            1.60                  6.93

100 YEAR Area rainfall data:


Area(Ac.)[1]        Rainfall(In)[2]      Weighting[1*2]
        4.33            4.10                 17.75

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.100(In)

Point rain (area averaged) =    2.629(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.628(In)

Sub-Area Data:
Area(Ac.)          Runoff Index   Impervious %
     4.330            80.00          0.000
```

Total Area Entered = 4.33(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.0	80.0	0.244	0.000	0.244	1.000	0.244
					Sum (F) =	0.244

Area averaged mean soil loss (F) (In/Hr) = 0.244
Minimum soil loss rate ((In/Hr)) = 0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

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

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %		Unit Hydrograph (CFS)
1	0.083	191.518	41.897		1.828
2	0.167	383.035	43.964		1.918
3	0.250	574.553	9.149		0.399
4	0.333	766.070	3.628		0.158
5	0.417	957.588	1.363		0.059
			Sum = 100.000	Sum=	4.364

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.021	(0.433)	0.019	0.002
2	0.17	0.07	0.021	(0.431)	0.019	0.002
3	0.25	0.07	0.021	(0.429)	0.019	0.002
4	0.33	0.10	0.032	(0.428)	0.028	0.003
5	0.42	0.10	0.032	(0.426)	0.028	0.003
6	0.50	0.10	0.032	(0.424)	0.028	0.003
7	0.58	0.10	0.032	(0.423)	0.028	0.003
8	0.67	0.10	0.032	(0.421)	0.028	0.003
9	0.75	0.10	0.032	(0.419)	0.028	0.003
10	0.83	0.13	0.042	(0.418)	0.038	0.004
11	0.92	0.13	0.042	(0.416)	0.038	0.004
12	1.00	0.13	0.042	(0.414)	0.038	0.004
13	1.08	0.10	0.032	(0.413)	0.028	0.003
14	1.17	0.10	0.032	(0.411)	0.028	0.003
15	1.25	0.10	0.032	(0.409)	0.028	0.003
16	1.33	0.10	0.032	(0.408)	0.028	0.003
17	1.42	0.10	0.032	(0.406)	0.028	0.003
18	1.50	0.10	0.032	(0.405)	0.028	0.003
19	1.58	0.10	0.032	(0.403)	0.028	0.003
20	1.67	0.10	0.032	(0.401)	0.028	0.003
21	1.75	0.10	0.032	(0.400)	0.028	0.003
22	1.83	0.13	0.042	(0.398)	0.038	0.004
23	1.92	0.13	0.042	(0.396)	0.038	0.004
24	2.00	0.13	0.042	(0.395)	0.038	0.004
25	2.08	0.13	0.042	(0.393)	0.038	0.004
26	2.17	0.13	0.042	(0.392)	0.038	0.004
27	2.25	0.13	0.042	(0.390)	0.038	0.004
28	2.33	0.13	0.042	(0.389)	0.038	0.004
29	2.42	0.13	0.042	(0.387)	0.038	0.004
30	2.50	0.13	0.042	(0.385)	0.038	0.004
31	2.58	0.17	0.053	(0.384)	0.047	0.005
32	2.67	0.17	0.053	(0.382)	0.047	0.005
33	2.75	0.17	0.053	(0.381)	0.047	0.005
34	2.83	0.17	0.053	(0.379)	0.047	0.005
35	2.92	0.17	0.053	(0.378)	0.047	0.005
36	3.00	0.17	0.053	(0.376)	0.047	0.005

37	3.08	0.17	0.053	(0.374)	0.047	0.005
38	3.17	0.17	0.053	(0.373)	0.047	0.005
39	3.25	0.17	0.053	(0.371)	0.047	0.005
40	3.33	0.17	0.053	(0.370)	0.047	0.005
41	3.42	0.17	0.053	(0.368)	0.047	0.005
42	3.50	0.17	0.053	(0.367)	0.047	0.005
43	3.58	0.17	0.053	(0.365)	0.047	0.005
44	3.67	0.17	0.053	(0.364)	0.047	0.005
45	3.75	0.17	0.053	(0.362)	0.047	0.005
46	3.83	0.20	0.063	(0.361)	0.057	0.006
47	3.92	0.20	0.063	(0.359)	0.057	0.006
48	4.00	0.20	0.063	(0.357)	0.057	0.006
49	4.08	0.20	0.063	(0.356)	0.057	0.006
50	4.17	0.20	0.063	(0.354)	0.057	0.006
51	4.25	0.20	0.063	(0.353)	0.057	0.006
52	4.33	0.23	0.074	(0.351)	0.066	0.007
53	4.42	0.23	0.074	(0.350)	0.066	0.007
54	4.50	0.23	0.074	(0.348)	0.066	0.007
55	4.58	0.23	0.074	(0.347)	0.066	0.007
56	4.67	0.23	0.074	(0.345)	0.066	0.007
57	4.75	0.23	0.074	(0.344)	0.066	0.007
58	4.83	0.27	0.084	(0.342)	0.076	0.008
59	4.92	0.27	0.084	(0.341)	0.076	0.008
60	5.00	0.27	0.084	(0.340)	0.076	0.008
61	5.08	0.20	0.063	(0.338)	0.057	0.006
62	5.17	0.20	0.063	(0.337)	0.057	0.006
63	5.25	0.20	0.063	(0.335)	0.057	0.006
64	5.33	0.23	0.074	(0.334)	0.066	0.007
65	5.42	0.23	0.074	(0.332)	0.066	0.007
66	5.50	0.23	0.074	(0.331)	0.066	0.007
67	5.58	0.27	0.084	(0.329)	0.076	0.008
68	5.67	0.27	0.084	(0.328)	0.076	0.008
69	5.75	0.27	0.084	(0.326)	0.076	0.008
70	5.83	0.27	0.084	(0.325)	0.076	0.008
71	5.92	0.27	0.084	(0.324)	0.076	0.008
72	6.00	0.27	0.084	(0.322)	0.076	0.008
73	6.08	0.30	0.095	(0.321)	0.085	0.009
74	6.17	0.30	0.095	(0.319)	0.085	0.009
75	6.25	0.30	0.095	(0.318)	0.085	0.009
76	6.33	0.30	0.095	(0.316)	0.085	0.009
77	6.42	0.30	0.095	(0.315)	0.085	0.009
78	6.50	0.30	0.095	(0.314)	0.085	0.009
79	6.58	0.33	0.105	(0.312)	0.095	0.011
80	6.67	0.33	0.105	(0.311)	0.095	0.011
81	6.75	0.33	0.105	(0.309)	0.095	0.011
82	6.83	0.33	0.105	(0.308)	0.095	0.011
83	6.92	0.33	0.105	(0.307)	0.095	0.011
84	7.00	0.33	0.105	(0.305)	0.095	0.011
85	7.08	0.33	0.105	(0.304)	0.095	0.011
86	7.17	0.33	0.105	(0.302)	0.095	0.011
87	7.25	0.33	0.105	(0.301)	0.095	0.011
88	7.33	0.37	0.116	(0.300)	0.104	0.012
89	7.42	0.37	0.116	(0.298)	0.104	0.012
90	7.50	0.37	0.116	(0.297)	0.104	0.012
91	7.58	0.40	0.126	(0.296)	0.114	0.013
92	7.67	0.40	0.126	(0.294)	0.114	0.013
93	7.75	0.40	0.126	(0.293)	0.114	0.013
94	7.83	0.43	0.137	(0.291)	0.123	0.014
95	7.92	0.43	0.137	(0.290)	0.123	0.014
96	8.00	0.43	0.137	(0.289)	0.123	0.014
97	8.08	0.50	0.158	(0.287)	0.142	0.016
98	8.17	0.50	0.158	(0.286)	0.142	0.016
99	8.25	0.50	0.158	(0.285)	0.142	0.016
100	8.33	0.50	0.158	(0.283)	0.142	0.016
101	8.42	0.50	0.158	(0.282)	0.142	0.016
102	8.50	0.50	0.158	(0.281)	0.142	0.016
103	8.58	0.53	0.168	(0.279)	0.151	0.017
104	8.67	0.53	0.168	(0.278)	0.151	0.017
105	8.75	0.53	0.168	(0.277)	0.151	0.017
106	8.83	0.57	0.179	(0.276)	0.161	0.018
107	8.92	0.57	0.179	(0.274)	0.161	0.018

108	9.00	0.57	0.179	(0.273)	0.161	0.018
109	9.08	0.63	0.200	(0.272)	0.180	0.020
110	9.17	0.63	0.200	(0.270)	0.180	0.020
111	9.25	0.63	0.200	(0.269)	0.180	0.020
112	9.33	0.67	0.210	(0.268)	0.189	0.021
113	9.42	0.67	0.210	(0.266)	0.189	0.021
114	9.50	0.67	0.210	(0.265)	0.189	0.021
115	9.58	0.70	0.221	(0.264)	0.199	0.022
116	9.67	0.70	0.221	(0.263)	0.199	0.022
117	9.75	0.70	0.221	(0.261)	0.199	0.022
118	9.83	0.73	0.231	(0.260)	0.208	0.023
119	9.92	0.73	0.231	(0.259)	0.208	0.023
120	10.00	0.73	0.231	(0.258)	0.208	0.023
121	10.08	0.50	0.158	(0.256)	0.142	0.016
122	10.17	0.50	0.158	(0.255)	0.142	0.016
123	10.25	0.50	0.158	(0.254)	0.142	0.016
124	10.33	0.50	0.158	(0.253)	0.142	0.016
125	10.42	0.50	0.158	(0.251)	0.142	0.016
126	10.50	0.50	0.158	(0.250)	0.142	0.016
127	10.58	0.67	0.210	(0.249)	0.189	0.021
128	10.67	0.67	0.210	(0.248)	0.189	0.021
129	10.75	0.67	0.210	(0.247)	0.189	0.021
130	10.83	0.67	0.210	(0.245)	0.189	0.021
131	10.92	0.67	0.210	(0.244)	0.189	0.021
132	11.00	0.67	0.210	(0.243)	0.189	0.021
133	11.08	0.63	0.200	(0.242)	0.180	0.020
134	11.17	0.63	0.200	(0.241)	0.180	0.020
135	11.25	0.63	0.200	(0.239)	0.180	0.020
136	11.33	0.63	0.200	(0.238)	0.180	0.020
137	11.42	0.63	0.200	(0.237)	0.180	0.020
138	11.50	0.63	0.200	(0.236)	0.180	0.020
139	11.58	0.57	0.179	(0.235)	0.161	0.018
140	11.67	0.57	0.179	(0.234)	0.161	0.018
141	11.75	0.57	0.179	(0.232)	0.161	0.018
142	11.83	0.60	0.189	(0.231)	0.170	0.019
143	11.92	0.60	0.189	(0.230)	0.170	0.019
144	12.00	0.60	0.189	(0.229)	0.170	0.019
145	12.08	0.83	0.263	0.228	(0.237)	0.035
146	12.17	0.83	0.263	0.227	(0.237)	0.036
147	12.25	0.83	0.263	0.225	(0.237)	0.037
148	12.33	0.87	0.273	0.224	(0.246)	0.049
149	12.42	0.87	0.273	0.223	(0.246)	0.050
150	12.50	0.87	0.273	0.222	(0.246)	0.051
151	12.58	0.93	0.294	0.221	(0.265)	0.073
152	12.67	0.93	0.294	0.220	(0.265)	0.075
153	12.75	0.93	0.294	0.219	(0.265)	0.076
154	12.83	0.97	0.305	0.218	(0.274)	0.087
155	12.92	0.97	0.305	0.217	(0.274)	0.088
156	13.00	0.97	0.305	0.215	(0.274)	0.089
157	13.08	1.13	0.357	0.214	(0.322)	0.143
158	13.17	1.13	0.357	0.213	(0.322)	0.144
159	13.25	1.13	0.357	0.212	(0.322)	0.145
160	13.33	1.13	0.357	0.211	(0.322)	0.146
161	13.42	1.13	0.357	0.210	(0.322)	0.147
162	13.50	1.13	0.357	0.209	(0.322)	0.148
163	13.58	0.77	0.242	0.208	(0.218)	0.034
164	13.67	0.77	0.242	0.207	(0.218)	0.035
165	13.75	0.77	0.242	0.206	(0.218)	0.036
166	13.83	0.77	0.242	0.205	(0.218)	0.037
167	13.92	0.77	0.242	0.204	(0.218)	0.038
168	14.00	0.77	0.242	0.203	(0.218)	0.039
169	14.08	0.90	0.284	0.202	(0.255)	0.082
170	14.17	0.90	0.284	0.201	(0.255)	0.083
171	14.25	0.90	0.284	0.200	(0.255)	0.084
172	14.33	0.87	0.273	0.199	(0.246)	0.075
173	14.42	0.87	0.273	0.198	(0.246)	0.076
174	14.50	0.87	0.273	0.197	(0.246)	0.077
175	14.58	0.87	0.273	0.196	(0.246)	0.078
176	14.67	0.87	0.273	0.195	(0.246)	0.079
177	14.75	0.87	0.273	0.194	(0.246)	0.080
178	14.83	0.83	0.263	0.193	(0.237)	0.070

179	14.92	0.83	0.263	0.192	(0.237)	0.071
180	15.00	0.83	0.263	0.191	(0.237)	0.072
181	15.08	0.80	0.252	0.190	(0.227)	0.063
182	15.17	0.80	0.252	0.189	(0.227)	0.064
183	15.25	0.80	0.252	0.188	(0.227)	0.065
184	15.33	0.77	0.242	0.187	(0.218)	0.055
185	15.42	0.77	0.242	0.186	(0.218)	0.056
186	15.50	0.77	0.242	0.185	(0.218)	0.057
187	15.58	0.63	0.200	(0.184)	0.180	0.020
188	15.67	0.63	0.200	(0.183)	0.180	0.020
189	15.75	0.63	0.200	(0.182)	0.180	0.020
190	15.83	0.63	0.200	(0.181)	0.180	0.020
191	15.92	0.63	0.200	(0.180)	0.180	0.020
192	16.00	0.63	0.200	0.179	(0.180)	0.021
193	16.08	0.13	0.042	(0.178)	0.038	0.004
194	16.17	0.13	0.042	(0.177)	0.038	0.004
195	16.25	0.13	0.042	(0.176)	0.038	0.004
196	16.33	0.13	0.042	(0.176)	0.038	0.004
197	16.42	0.13	0.042	(0.175)	0.038	0.004
198	16.50	0.13	0.042	(0.174)	0.038	0.004
199	16.58	0.10	0.032	(0.173)	0.028	0.003
200	16.67	0.10	0.032	(0.172)	0.028	0.003
201	16.75	0.10	0.032	(0.171)	0.028	0.003
202	16.83	0.10	0.032	(0.170)	0.028	0.003
203	16.92	0.10	0.032	(0.169)	0.028	0.003
204	17.00	0.10	0.032	(0.169)	0.028	0.003
205	17.08	0.17	0.053	(0.168)	0.047	0.005
206	17.17	0.17	0.053	(0.167)	0.047	0.005
207	17.25	0.17	0.053	(0.166)	0.047	0.005
208	17.33	0.17	0.053	(0.165)	0.047	0.005
209	17.42	0.17	0.053	(0.164)	0.047	0.005
210	17.50	0.17	0.053	(0.164)	0.047	0.005
211	17.58	0.17	0.053	(0.163)	0.047	0.005
212	17.67	0.17	0.053	(0.162)	0.047	0.005
213	17.75	0.17	0.053	(0.161)	0.047	0.005
214	17.83	0.13	0.042	(0.160)	0.038	0.004
215	17.92	0.13	0.042	(0.159)	0.038	0.004
216	18.00	0.13	0.042	(0.159)	0.038	0.004
217	18.08	0.13	0.042	(0.158)	0.038	0.004
218	18.17	0.13	0.042	(0.157)	0.038	0.004
219	18.25	0.13	0.042	(0.156)	0.038	0.004
220	18.33	0.13	0.042	(0.156)	0.038	0.004
221	18.42	0.13	0.042	(0.155)	0.038	0.004
222	18.50	0.13	0.042	(0.154)	0.038	0.004
223	18.58	0.10	0.032	(0.153)	0.028	0.003
224	18.67	0.10	0.032	(0.153)	0.028	0.003
225	18.75	0.10	0.032	(0.152)	0.028	0.003
226	18.83	0.07	0.021	(0.151)	0.019	0.002
227	18.92	0.07	0.021	(0.150)	0.019	0.002
228	19.00	0.07	0.021	(0.150)	0.019	0.002
229	19.08	0.10	0.032	(0.149)	0.028	0.003
230	19.17	0.10	0.032	(0.148)	0.028	0.003
231	19.25	0.10	0.032	(0.148)	0.028	0.003
232	19.33	0.13	0.042	(0.147)	0.038	0.004
233	19.42	0.13	0.042	(0.146)	0.038	0.004
234	19.50	0.13	0.042	(0.146)	0.038	0.004
235	19.58	0.10	0.032	(0.145)	0.028	0.003
236	19.67	0.10	0.032	(0.144)	0.028	0.003
237	19.75	0.10	0.032	(0.144)	0.028	0.003
238	19.83	0.07	0.021	(0.143)	0.019	0.002
239	19.92	0.07	0.021	(0.142)	0.019	0.002
240	20.00	0.07	0.021	(0.142)	0.019	0.002
241	20.08	0.10	0.032	(0.141)	0.028	0.003
242	20.17	0.10	0.032	(0.140)	0.028	0.003
243	20.25	0.10	0.032	(0.140)	0.028	0.003
244	20.33	0.10	0.032	(0.139)	0.028	0.003
245	20.42	0.10	0.032	(0.139)	0.028	0.003
246	20.50	0.10	0.032	(0.138)	0.028	0.003
247	20.58	0.10	0.032	(0.137)	0.028	0.003
248	20.67	0.10	0.032	(0.137)	0.028	0.003
249	20.75	0.10	0.032	(0.136)	0.028	0.003

250	20.83	0.07	0.021	(0.136)	0.019	0.002
251	20.92	0.07	0.021	(0.135)	0.019	0.002
252	21.00	0.07	0.021	(0.135)	0.019	0.002
253	21.08	0.10	0.032	(0.134)	0.028	0.003
254	21.17	0.10	0.032	(0.134)	0.028	0.003
255	21.25	0.10	0.032	(0.133)	0.028	0.003
256	21.33	0.07	0.021	(0.133)	0.019	0.002
257	21.42	0.07	0.021	(0.132)	0.019	0.002
258	21.50	0.07	0.021	(0.132)	0.019	0.002
259	21.58	0.10	0.032	(0.131)	0.028	0.003
260	21.67	0.10	0.032	(0.131)	0.028	0.003
261	21.75	0.10	0.032	(0.130)	0.028	0.003
262	21.83	0.07	0.021	(0.130)	0.019	0.002
263	21.92	0.07	0.021	(0.129)	0.019	0.002
264	22.00	0.07	0.021	(0.129)	0.019	0.002
265	22.08	0.10	0.032	(0.128)	0.028	0.003
266	22.17	0.10	0.032	(0.128)	0.028	0.003
267	22.25	0.10	0.032	(0.128)	0.028	0.003
268	22.33	0.07	0.021	(0.127)	0.019	0.002
269	22.42	0.07	0.021	(0.127)	0.019	0.002
270	22.50	0.07	0.021	(0.126)	0.019	0.002
271	22.58	0.07	0.021	(0.126)	0.019	0.002
272	22.67	0.07	0.021	(0.126)	0.019	0.002
273	22.75	0.07	0.021	(0.125)	0.019	0.002
274	22.83	0.07	0.021	(0.125)	0.019	0.002
275	22.92	0.07	0.021	(0.125)	0.019	0.002
276	23.00	0.07	0.021	(0.124)	0.019	0.002
277	23.08	0.07	0.021	(0.124)	0.019	0.002
278	23.17	0.07	0.021	(0.124)	0.019	0.002
279	23.25	0.07	0.021	(0.124)	0.019	0.002
280	23.33	0.07	0.021	(0.123)	0.019	0.002
281	23.42	0.07	0.021	(0.123)	0.019	0.002
282	23.50	0.07	0.021	(0.123)	0.019	0.002
283	23.58	0.07	0.021	(0.123)	0.019	0.002
284	23.67	0.07	0.021	(0.122)	0.019	0.002
285	23.75	0.07	0.021	(0.122)	0.019	0.002
286	23.83	0.07	0.021	(0.122)	0.019	0.002
287	23.92	0.07	0.021	(0.122)	0.019	0.002
288	24.00	0.07	0.021	(0.122)	0.019	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.1

Flood volume = Effective rainfall 0.43(In)
times area 4.3(Ac.)/[(In)/(Ft.)] = 0.2(Ac.Ft)
Total soil loss = 2.20(In)
Total soil loss = 0.795(Ac.Ft)
Total rainfall = 2.63(In)
Flood volume = 6689.0 Cubic Feet
Total soil loss = 34625.4 Cubic Feet

Peak flow rate of this hydrograph = 0.645(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	0.00	Q	|	|	|	|
0+10	0.0001	0.01	Q	|	|	|	|
0+15	0.0001	0.01	Q	|	|	|	|
0+20	0.0002	0.01	Q	|	|	|	|
0+25	0.0003	0.01	Q	|	|	|	|
0+30	0.0004	0.01	Q	|	|	|	|
0+35	0.0005	0.01	Q	|	|	|	|
0+40	0.0006	0.01	Q	|	|	|	|
0+45	0.0007	0.01	Q	|	|	|	|
0+50	0.0008	0.02	Q	|	|	|	|
0+55	0.0009	0.02	Q	|	|	|	|

1+ 0	0.0010	0.02	Q	|	|	|	|
1+ 5	0.0012	0.02	Q	|	|	|	|
1+10	0.0013	0.01	Q	|	|	|	|
1+15	0.0013	0.01	Q	|	|	|	|
1+20	0.0014	0.01	Q	|	|	|	|
1+25	0.0015	0.01	Q	|	|	|	|
1+30	0.0016	0.01	Q	|	|	|	|
1+35	0.0017	0.01	Q	|	|	|	|
1+40	0.0018	0.01	Q	|	|	|	|
1+45	0.0019	0.01	Q	|	|	|	|
1+50	0.0020	0.02	Q	|	|	|	|
1+55	0.0021	0.02	Q	|	|	|	|
2+ 0	0.0023	0.02	Q	|	|	|	|
2+ 5	0.0024	0.02	Q	|	|	|	|
2+10	0.0025	0.02	Q	|	|	|	|
2+15	0.0027	0.02	Q	|	|	|	|
2+20	0.0028	0.02	Q	|	|	|	|
2+25	0.0029	0.02	Q	|	|	|	|
2+30	0.0030	0.02	Q	|	|	|	|
2+35	0.0032	0.02	Q	|	|	|	|
2+40	0.0033	0.02	Q	|	|	|	|
2+45	0.0035	0.02	Q	|	|	|	|
2+50	0.0036	0.02	Q	|	|	|	|
2+55	0.0038	0.02	Q	|	|	|	|
3+ 0	0.0040	0.02	QV	|	|	|	|
3+ 5	0.0041	0.02	QV	|	|	|	|
3+10	0.0043	0.02	QV	|	|	|	|
3+15	0.0044	0.02	QV	|	|	|	|
3+20	0.0046	0.02	QV	|	|	|	|
3+25	0.0047	0.02	QV	|	|	|	|
3+30	0.0049	0.02	QV	|	|	|	|
3+35	0.0051	0.02	QV	|	|	|	|
3+40	0.0052	0.02	QV	|	|	|	|
3+45	0.0054	0.02	QV	|	|	|	|
3+50	0.0055	0.02	QV	|	|	|	|
3+55	0.0057	0.03	QV	|	|	|	|
4+ 0	0.0059	0.03	QV	|	|	|	|
4+ 5	0.0061	0.03	QV	|	|	|	|
4+10	0.0063	0.03	QV	|	|	|	|
4+15	0.0065	0.03	QV	|	|	|	|
4+20	0.0067	0.03	QV	|	|	|	|
4+25	0.0069	0.03	QV	|	|	|	|
4+30	0.0071	0.03	QV	|	|	|	|
4+35	0.0074	0.03	QV	|	|	|	|
4+40	0.0076	0.03	QV	|	|	|	|
4+45	0.0078	0.03	Q V	|	|	|	|
4+50	0.0080	0.03	Q V	|	|	|	|
4+55	0.0083	0.04	Q V	|	|	|	|
5+ 0	0.0085	0.04	Q V	|	|	|	|
5+ 5	0.0088	0.03	Q V	|	|	|	|
5+10	0.0090	0.03	Q V	|	|	|	|
5+15	0.0091	0.03	Q V	|	|	|	|
5+20	0.0093	0.03	Q V	|	|	|	|
5+25	0.0096	0.03	Q V	|	|	|	|
5+30	0.0098	0.03	Q V	|	|	|	|
5+35	0.0100	0.03	Q V	|	|	|	|
5+40	0.0103	0.04	Q V	|	|	|	|
5+45	0.0105	0.04	Q V	|	|	|	|
5+50	0.0108	0.04	Q V	|	|	|	|
5+55	0.0110	0.04	Q V	|	|	|	|
6+ 0	0.0113	0.04	Q V	|	|	|	|
6+ 5	0.0115	0.04	Q V	|	|	|	|
6+10	0.0118	0.04	Q V	|	|	|	|
6+15	0.0121	0.04	Q V	|	|	|	|
6+20	0.0124	0.04	Q V	|	|	|	|
6+25	0.0127	0.04	Q V	|	|	|	|
6+30	0.0130	0.04	Q V	|	|	|	|
6+35	0.0133	0.04	Q V	|	|	|	|
6+40	0.0136	0.05	Q V	|	|	|	|
6+45	0.0139	0.05	Q V	|	|	|	|
6+50	0.0142	0.05	Q V	|	|	|	|

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 6+55        0.0145       0.05  Q  V       |          |          |          |
 7+ 0        0.0148       0.05  Q  V       |          |          |          |
 7+ 5        0.0151       0.05  Q  V       |          |          |          |
 7+10        0.0155       0.05  Q   V      |          |          |          |
 7+15        0.0158       0.05  Q   V      |          |          |          |
 7+20        0.0161       0.05  Q   V      |          |          |          |
 7+25        0.0165       0.05  Q   V      |          |          |          |
 7+30        0.0168       0.05  Q   V      |          |          |          |
 7+35        0.0172       0.05  Q   V      |          |          |          |
 7+40        0.0175       0.05  Q   V      |          |          |          |
 7+45        0.0179       0.05  Q   V      |          |          |          |
 7+50        0.0183       0.06  Q   V      |          |          |          |
 7+55        0.0187       0.06  Q   V      |          |          |          |
 8+ 0        0.0191       0.06  Q   V      |          |          |          |
 8+ 5        0.0196       0.06  Q    V     |          |          |          |
 8+10        0.0200       0.07  Q    V     |          |          |          |
 8+15        0.0205       0.07  Q    V     |          |          |          |
 8+20        0.0210       0.07  Q    V     |          |          |          |
 8+25        0.0214       0.07  Q    V     |          |          |          |
 8+30        0.0219       0.07  Q    V     |          |          |          |
 8+35        0.0224       0.07  Q    V     |          |          |          |
 8+40        0.0229       0.07  Q    V     |          |          |          |
 8+45        0.0234       0.07  Q     V    |          |          |          |
 8+50        0.0239       0.08  Q     V    |          |          |          |
 8+55        0.0245       0.08  Q     V    |          |          |          |
 9+ 0        0.0250       0.08  Q     V    |          |          |          |
 9+ 5        0.0256       0.08  Q     V    |          |          |          |
 9+10        0.0262       0.09  Q     V    |          |          |          |
 9+15        0.0267       0.09  Q     V    |          |          |          |
 9+20        0.0274       0.09  Q      V   |          |          |          |
 9+25        0.0280       0.09  Q      V   |          |          |          |
 9+30        0.0286       0.09  Q      V   |          |          |          |
 9+35        0.0293       0.09  Q      V   |          |          |          |
 9+40        0.0299       0.10  Q      V   |          |          |          |
 9+45        0.0306       0.10  Q      V   |          |          |          |
 9+50        0.0313       0.10  Q       V  |          |          |          |
 9+55        0.0320       0.10  Q       V  |          |          |          |
10+ 0        0.0326       0.10  Q       V  |          |          |          |
10+ 5        0.0333       0.09  Q       V  |          |          |          |
10+10        0.0338       0.07  Q       V  |          |          |          |
10+15        0.0342       0.07  Q       V  |          |          |          |
10+20        0.0347       0.07  Q        V|          |          |          |
10+25        0.0352       0.07  Q        V|          |          |          |
10+30        0.0357       0.07  Q        V|          |          |          |
10+35        0.0362       0.08  Q        V|          |          |          |
10+40        0.0368       0.09  Q        V|          |          |          |
10+45        0.0374       0.09  Q        V|          |          |          |
10+50        0.0381       0.09  Q        V|          |          |          |
10+55        0.0387       0.09  Q         V          |          |          |
11+ 0        0.0393       0.09  Q         V          |          |          |
11+ 5        0.0400       0.09  Q         V          |          |          |
11+10        0.0406       0.09  Q         V          |          |          |
11+15        0.0412       0.09  Q         V          |          |          |
11+20        0.0418       0.09  Q         V          |          |          |
11+25        0.0424       0.09  Q         |V         |          |          |
11+30        0.0430       0.09  Q         |V         |          |          |
11+35        0.0435       0.08  Q         |V         |          |          |
11+40        0.0441       0.08  Q         |V         |          |          |
11+45        0.0446       0.08  Q         |V         |          |          |
11+50        0.0452       0.08  Q         |V         |          |          |
11+55        0.0457       0.08  Q         |V         |          |          |
12+ 0        0.0463       0.08  Q         | V        |          |          |
12+ 5        0.0471       0.11  Q         | V        |          |          |
12+10        0.0481       0.15  Q         | V        |          |          |
12+15        0.0492       0.16  Q         | V        |          |          |
12+20        0.0504       0.18  Q         |  V       |          |          |
12+25        0.0519       0.21  Q         |  V       |          |          |
12+30        0.0534       0.22  Q         |  V       |          |          |
12+35        0.0552       0.26  |Q        |   V      |          |          |
12+40        0.0573       0.31  |Q        |   V      |          |          |
12+45        0.0595       0.32  |Q        |    V     |          |          |
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12+50      0.0619     0.35  |Q        |     V   |         |         |
12+55      0.0645     0.38  |Q        |     V   |         |         |
13+ 0      0.0671     0.38  |Q        |      V  |         |         |
13+ 5      0.0705     0.49  |Q        |       V |         |         |
13+10      0.0746     0.59  | Q       |        V|         |         |
13+15      0.0788     0.62  | Q       |         V         |         |
13+20      0.0832     0.63  | Q       |         |V        |         |
13+25      0.0876     0.64  | Q       |         | V       |         |
13+30      0.0920     0.64  | Q       |         |  V      |         |
13+35      0.0951     0.44  |Q        |         |   V     |         |
13+40      0.0966     0.22  Q         |         |    V    |         |
13+45      0.0978     0.18  Q         |         |    V    |         |
13+50      0.0989     0.17  Q         |         |    V    |         |
13+55      0.1001     0.16  Q         |         |     V   |         |
14+ 0      0.1012     0.17  Q         |         |     V   |         |
14+ 5      0.1029     0.25  Q         |         |     V   |         |
14+10      0.1052     0.33  |Q        |         |      V  |         |
14+15      0.1077     0.36  |Q        |         |       V |         |
14+20      0.1101     0.35  |Q        |         |       V |         |
14+25      0.1124     0.33  |Q        |         |        V|         |
14+30      0.1147     0.33  |Q        |         |        V|         |
14+35      0.1170     0.34  |Q        |         |         V         |
14+40      0.1193     0.34  |Q        |         |         |V        |
14+45      0.1217     0.35  |Q        |         |         |V        |
14+50      0.1240     0.33  |Q        |         |         | V       |
14+55      0.1262     0.31  |Q        |         |         | V       |
15+ 0      0.1283     0.31  |Q        |         |         |  V      |
15+ 5      0.1304     0.30  |Q        |         |         |  V      |
15+10      0.1323     0.28  |Q        |         |         |   V     |
15+15      0.1342     0.28  |Q        |         |         |   V     |
15+20      0.1361     0.26  |Q        |         |         |    V    |
15+25      0.1378     0.25  Q         |         |         |    V    |
15+30      0.1395     0.25  Q         |         |         |     V   |
15+35      0.1407     0.18  Q         |         |         |     V   |
15+40      0.1415     0.11  Q         |         |         |     V   |
15+45      0.1421     0.10  Q         |         |         |      V  |
15+50      0.1428     0.09  Q         |         |         |      V  |
15+55      0.1434     0.09  Q         |         |         |      V  |
16+ 0      0.1440     0.09  Q         |         |         |      V  |
16+ 5      0.1444     0.06  Q         |         |         |      V  |
16+10      0.1446     0.03  Q         |         |         |      V  |
16+15      0.1447     0.02  Q         |         |         |      V  |
16+20      0.1449     0.02  Q         |         |         |      V  |
16+25      0.1450     0.02  Q         |         |         |      V  |
16+30      0.1451     0.02  Q         |         |         |      V  |
16+35      0.1452     0.02  Q         |         |         |      V  |
16+40      0.1453     0.01  Q         |         |         |      V  |
16+45      0.1454     0.01  Q         |         |         |      V  |
16+50      0.1455     0.01  Q         |         |         |      V  |
16+55      0.1456     0.01  Q         |         |         |      V  |
17+ 0      0.1457     0.01  Q         |         |         |      V  |
17+ 5      0.1458     0.02  Q         |         |         |      V  |
17+10      0.1460     0.02  Q         |         |         |       V |
17+15      0.1461     0.02  Q         |         |         |       V |
17+20      0.1463     0.02  Q         |         |         |       V |
17+25      0.1464     0.02  Q         |         |         |       V |
17+30      0.1466     0.02  Q         |         |         |       V |
17+35      0.1468     0.02  Q         |         |         |       V |
17+40      0.1469     0.02  Q         |         |         |       V |
17+45      0.1471     0.02  Q         |         |         |       V |
17+50      0.1472     0.02  Q         |         |         |       V |
17+55      0.1474     0.02  Q         |         |         |       V |
18+ 0      0.1475     0.02  Q         |         |         |       V |
18+ 5      0.1476     0.02  Q         |         |         |       V |
18+10      0.1477     0.02  Q         |         |         |       V |
18+15      0.1479     0.02  Q         |         |         |       V |
18+20      0.1480     0.02  Q         |         |         |       V |
18+25      0.1481     0.02  Q         |         |         |       V |
18+30      0.1482     0.02  Q         |         |         |       V |
18+35      0.1484     0.02  Q         |         |         |       V |
18+40      0.1485     0.01  Q         |         |         |       V |
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  18+45       0.1486      0.01  Q          |          |          |        V |
  18+50       0.1486      0.01  Q          |          |          |        V |
  18+55       0.1487      0.01  Q          |          |          |        V |
  19+ 0       0.1488      0.01  Q          |          |          |        V |
  19+ 5       0.1488      0.01  Q          |          |          |        V |
  19+10       0.1489      0.01  Q          |          |          |        V |
  19+15       0.1490      0.01  Q          |          |          |        V |
  19+20       0.1491      0.02  Q          |          |          |        V |
  19+25       0.1493      0.02  Q          |          |          |        V |
  19+30       0.1494      0.02  Q          |          |          |        V |
  19+35       0.1495      0.02  Q          |          |          |        V |
  19+40       0.1496      0.01  Q          |          |          |        V |
  19+45       0.1497      0.01  Q          |          |          |        V |
  19+50       0.1498      0.01  Q          |          |          |         V|
  19+55       0.1498      0.01  Q          |          |          |         V|
  20+ 0       0.1499      0.01  Q          |          |          |         V|
  20+ 5       0.1500      0.01  Q          |          |          |         V|
  20+10       0.1501      0.01  Q          |          |          |         V|
  20+15       0.1502      0.01  Q          |          |          |         V|
  20+20       0.1503      0.01  Q          |          |          |         V|
  20+25       0.1504      0.01  Q          |          |          |         V|
  20+30       0.1504      0.01  Q          |          |          |         V|
  20+35       0.1505      0.01  Q          |          |          |         V|
  20+40       0.1506      0.01  Q          |          |          |         V|
  20+45       0.1507      0.01  Q          |          |          |         V|
  20+50       0.1508      0.01  Q          |          |          |         V|
  20+55       0.1509      0.01  Q          |          |          |         V|
  21+ 0       0.1509      0.01  Q          |          |          |         V|
  21+ 5       0.1510      0.01  Q          |          |          |         V|
  21+10       0.1511      0.01  Q          |          |          |         V|
  21+15       0.1512      0.01  Q          |          |          |         V|
  21+20       0.1513      0.01  Q          |          |          |         V|
  21+25       0.1514      0.01  Q          |          |          |         V|
  21+30       0.1514      0.01  Q          |          |          |         V|
  21+35       0.1515      0.01  Q          |          |          |         V|
  21+40       0.1516      0.01  Q          |          |          |         V|
  21+45       0.1517      0.01  Q          |          |          |         V|
  21+50       0.1518      0.01  Q          |          |          |         V|
  21+55       0.1518      0.01  Q          |          |          |         V|
  22+ 0       0.1519      0.01  Q          |          |          |         V|
  22+ 5       0.1520      0.01  Q          |          |          |         V|
  22+10       0.1521      0.01  Q          |          |          |         V|
  22+15       0.1522      0.01  Q          |          |          |         V|
  22+20       0.1522      0.01  Q          |          |          |         V|
  22+25       0.1523      0.01  Q          |          |          |         V|
  22+30       0.1524      0.01  Q          |          |          |         V|
  22+35       0.1524      0.01  Q          |          |          |         V|
  22+40       0.1525      0.01  Q          |          |          |         V|
  22+45       0.1526      0.01  Q          |          |          |         V|
  22+50       0.1526      0.01  Q          |          |          |         V|
  22+55       0.1527      0.01  Q          |          |          |         V|
  23+ 0       0.1528      0.01  Q          |          |          |         V|
  23+ 5       0.1528      0.01  Q          |          |          |         V|
  23+10       0.1529      0.01  Q          |          |          |         V|
  23+15       0.1529      0.01  Q          |          |          |         V|
  23+20       0.1530      0.01  Q          |          |          |         V|
  23+25       0.1531      0.01  Q          |          |          |         V|
  23+30       0.1531      0.01  Q          |          |          |         V|
  23+35       0.1532      0.01  Q          |          |          |         V|
  23+40       0.1533      0.01  Q          |          |          |         V|
  23+45       0.1533      0.01  Q          |          |          |         V|
  23+50       0.1534      0.01  Q          |          |          |         V|
  23+55       0.1534      0.01  Q          |          |          |         V|
  24+ 0       0.1535      0.01  Q          |          |          |         V|
  24+ 5       0.1535      0.01  Q          |          |          |         V|
  24+10       0.1536      0.00  Q          |          |          |         V|
  24+15       0.1536      0.00  Q          |          |          |         V|
  24+20       0.1536      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
```

APPENDIX G

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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
        Study date  01/04/22 File: 19004DEVHYD242.out

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


Program License Serial Number 6106

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

 English Units used in output format


---------------------------------------------------------------------
```

19-004 DEVELOPED CONDITION HYDROGRAPH METHOD 2 YEAR 24 HOUR EVENT

```
---------------------------------------------------------------------
Drainage Area =       4.33(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.33(Ac.)  =      0.007 Sq. Mi.
Length along longest watercourse =     812.30(Ft.)
Length along longest watercourse measured to centroid =     207.60(Ft.)
Length along longest watercourse =      0.154 Mi.
Length along longest watercourse measured to centroid =      0.039 Mi.
Difference in elevation =       4.47(Ft.)
Slope along watercourse =     29.0553 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.027 Hr.
Lag time =     1.63 Min.
25% of lag time =     0.41 Min.
40% of lag time =     0.65 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]
        4.33           1.60                  6.93

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.33           4.10                 17.75

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.100(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.600(In)

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

4.330	75.00	0.880

Total Area Entered = 4.33(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
75.0	57.0	0.501	0.880	0.104	1.000	0.104
					Sum (F) =	0.104

Area averaged mean soil loss (F) (In/Hr) = 0.104
Minimum soil loss rate ((In/Hr)) = 0.052
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.200

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

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	305.838	57.272	2.499
2	0.167	611.677	36.809	1.606
3	0.250	917.515	5.919	0.258
			Sum = 100.000	Sum= 4.364

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.013	(0.185)	0.003	0.010
2	0.17	0.07	0.013	(0.184)	0.003	0.010
3	0.25	0.07	0.013	(0.183)	0.003	0.010
4	0.33	0.10	0.019	(0.182)	0.004	0.015
5	0.42	0.10	0.019	(0.182)	0.004	0.015
6	0.50	0.10	0.019	(0.181)	0.004	0.015
7	0.58	0.10	0.019	(0.180)	0.004	0.015
8	0.67	0.10	0.019	(0.180)	0.004	0.015
9	0.75	0.10	0.019	(0.179)	0.004	0.015
10	0.83	0.13	0.026	(0.178)	0.005	0.020
11	0.92	0.13	0.026	(0.178)	0.005	0.020
12	1.00	0.13	0.026	(0.177)	0.005	0.020
13	1.08	0.10	0.019	(0.176)	0.004	0.015
14	1.17	0.10	0.019	(0.175)	0.004	0.015
15	1.25	0.10	0.019	(0.175)	0.004	0.015
16	1.33	0.10	0.019	(0.174)	0.004	0.015
17	1.42	0.10	0.019	(0.173)	0.004	0.015
18	1.50	0.10	0.019	(0.173)	0.004	0.015
19	1.58	0.10	0.019	(0.172)	0.004	0.015
20	1.67	0.10	0.019	(0.171)	0.004	0.015
21	1.75	0.10	0.019	(0.171)	0.004	0.015
22	1.83	0.13	0.026	(0.170)	0.005	0.020
23	1.92	0.13	0.026	(0.169)	0.005	0.020
24	2.00	0.13	0.026	(0.169)	0.005	0.020
25	2.08	0.13	0.026	(0.168)	0.005	0.020
26	2.17	0.13	0.026	(0.167)	0.005	0.020
27	2.25	0.13	0.026	(0.166)	0.005	0.020
28	2.33	0.13	0.026	(0.166)	0.005	0.020
29	2.42	0.13	0.026	(0.165)	0.005	0.020
30	2.50	0.13	0.026	(0.164)	0.005	0.020
31	2.58	0.17	0.032	(0.164)	0.006	0.026
32	2.67	0.17	0.032	(0.163)	0.006	0.026
33	2.75	0.17	0.032	(0.162)	0.006	0.026
34	2.83	0.17	0.032	(0.162)	0.006	0.026
35	2.92	0.17	0.032	(0.161)	0.006	0.026
36	3.00	0.17	0.032	(0.160)	0.006	0.026
37	3.08	0.17	0.032	(0.160)	0.006	0.026

38	3.17	0.17	0.032	(0.159)	0.006	0.026
39	3.25	0.17	0.032	(0.158)	0.006	0.026
40	3.33	0.17	0.032	(0.158)	0.006	0.026
41	3.42	0.17	0.032	(0.157)	0.006	0.026
42	3.50	0.17	0.032	(0.156)	0.006	0.026
43	3.58	0.17	0.032	(0.156)	0.006	0.026
44	3.67	0.17	0.032	(0.155)	0.006	0.026
45	3.75	0.17	0.032	(0.155)	0.006	0.026
46	3.83	0.20	0.038	(0.154)	0.008	0.031
47	3.92	0.20	0.038	(0.153)	0.008	0.031
48	4.00	0.20	0.038	(0.153)	0.008	0.031
49	4.08	0.20	0.038	(0.152)	0.008	0.031
50	4.17	0.20	0.038	(0.151)	0.008	0.031
51	4.25	0.20	0.038	(0.151)	0.008	0.031
52	4.33	0.23	0.045	(0.150)	0.009	0.036
53	4.42	0.23	0.045	(0.149)	0.009	0.036
54	4.50	0.23	0.045	(0.149)	0.009	0.036
55	4.58	0.23	0.045	(0.148)	0.009	0.036
56	4.67	0.23	0.045	(0.147)	0.009	0.036
57	4.75	0.23	0.045	(0.147)	0.009	0.036
58	4.83	0.27	0.051	(0.146)	0.010	0.041
59	4.92	0.27	0.051	(0.146)	0.010	0.041
60	5.00	0.27	0.051	(0.145)	0.010	0.041
61	5.08	0.20	0.038	(0.144)	0.008	0.031
62	5.17	0.20	0.038	(0.144)	0.008	0.031
63	5.25	0.20	0.038	(0.143)	0.008	0.031
64	5.33	0.23	0.045	(0.142)	0.009	0.036
65	5.42	0.23	0.045	(0.142)	0.009	0.036
66	5.50	0.23	0.045	(0.141)	0.009	0.036
67	5.58	0.27	0.051	(0.141)	0.010	0.041
68	5.67	0.27	0.051	(0.140)	0.010	0.041
69	5.75	0.27	0.051	(0.139)	0.010	0.041
70	5.83	0.27	0.051	(0.139)	0.010	0.041
71	5.92	0.27	0.051	(0.138)	0.010	0.041
72	6.00	0.27	0.051	(0.137)	0.010	0.041
73	6.08	0.30	0.058	(0.137)	0.012	0.046
74	6.17	0.30	0.058	(0.136)	0.012	0.046
75	6.25	0.30	0.058	(0.136)	0.012	0.046
76	6.33	0.30	0.058	(0.135)	0.012	0.046
77	6.42	0.30	0.058	(0.134)	0.012	0.046
78	6.50	0.30	0.058	(0.134)	0.012	0.046
79	6.58	0.33	0.064	(0.133)	0.013	0.051
80	6.67	0.33	0.064	(0.133)	0.013	0.051
81	6.75	0.33	0.064	(0.132)	0.013	0.051
82	6.83	0.33	0.064	(0.131)	0.013	0.051
83	6.92	0.33	0.064	(0.131)	0.013	0.051
84	7.00	0.33	0.064	(0.130)	0.013	0.051
85	7.08	0.33	0.064	(0.130)	0.013	0.051
86	7.17	0.33	0.064	(0.129)	0.013	0.051
87	7.25	0.33	0.064	(0.128)	0.013	0.051
88	7.33	0.37	0.070	(0.128)	0.014	0.056
89	7.42	0.37	0.070	(0.127)	0.014	0.056
90	7.50	0.37	0.070	(0.127)	0.014	0.056
91	7.58	0.40	0.077	(0.126)	0.015	0.061
92	7.67	0.40	0.077	(0.126)	0.015	0.061
93	7.75	0.40	0.077	(0.125)	0.015	0.061
94	7.83	0.43	0.083	(0.124)	0.017	0.067
95	7.92	0.43	0.083	(0.124)	0.017	0.067
96	8.00	0.43	0.083	(0.123)	0.017	0.067
97	8.08	0.50	0.096	(0.123)	0.019	0.077
98	8.17	0.50	0.096	(0.122)	0.019	0.077
99	8.25	0.50	0.096	(0.122)	0.019	0.077
100	8.33	0.50	0.096	(0.121)	0.019	0.077
101	8.42	0.50	0.096	(0.120)	0.019	0.077
102	8.50	0.50	0.096	(0.120)	0.019	0.077
103	8.58	0.53	0.102	(0.119)	0.020	0.082
104	8.67	0.53	0.102	(0.119)	0.020	0.082
105	8.75	0.53	0.102	(0.118)	0.020	0.082
106	8.83	0.57	0.109	(0.118)	0.022	0.087
107	8.92	0.57	0.109	(0.117)	0.022	0.087
108	9.00	0.57	0.109	(0.116)	0.022	0.087

109	9.08	0.63	0.122	(0.116)	0.024	0.097
110	9.17	0.63	0.122	(0.115)	0.024	0.097
111	9.25	0.63	0.122	(0.115)	0.024	0.097
112	9.33	0.67	0.128	(0.114)	0.026	0.102
113	9.42	0.67	0.128	(0.114)	0.026	0.102
114	9.50	0.67	0.128	(0.113)	0.026	0.102
115	9.58	0.70	0.134	(0.113)	0.027	0.108
116	9.67	0.70	0.134	(0.112)	0.027	0.108
117	9.75	0.70	0.134	(0.112)	0.027	0.108
118	9.83	0.73	0.141	(0.111)	0.028	0.113
119	9.92	0.73	0.141	(0.110)	0.028	0.113
120	10.00	0.73	0.141	(0.110)	0.028	0.113
121	10.08	0.50	0.096	(0.109)	0.019	0.077
122	10.17	0.50	0.096	(0.109)	0.019	0.077
123	10.25	0.50	0.096	(0.108)	0.019	0.077
124	10.33	0.50	0.096	(0.108)	0.019	0.077
125	10.42	0.50	0.096	(0.107)	0.019	0.077
126	10.50	0.50	0.096	(0.107)	0.019	0.077
127	10.58	0.67	0.128	(0.106)	0.026	0.102
128	10.67	0.67	0.128	(0.106)	0.026	0.102
129	10.75	0.67	0.128	(0.105)	0.026	0.102
130	10.83	0.67	0.128	(0.105)	0.026	0.102
131	10.92	0.67	0.128	(0.104)	0.026	0.102
132	11.00	0.67	0.128	(0.104)	0.026	0.102
133	11.08	0.63	0.122	(0.103)	0.024	0.097
134	11.17	0.63	0.122	(0.103)	0.024	0.097
135	11.25	0.63	0.122	(0.102)	0.024	0.097
136	11.33	0.63	0.122	(0.102)	0.024	0.097
137	11.42	0.63	0.122	(0.101)	0.024	0.097
138	11.50	0.63	0.122	(0.101)	0.024	0.097
139	11.58	0.57	0.109	(0.100)	0.022	0.087
140	11.67	0.57	0.109	(0.100)	0.022	0.087
141	11.75	0.57	0.109	(0.099)	0.022	0.087
142	11.83	0.60	0.115	(0.099)	0.023	0.092
143	11.92	0.60	0.115	(0.098)	0.023	0.092
144	12.00	0.60	0.115	(0.098)	0.023	0.092
145	12.08	0.83	0.160	(0.097)	0.032	0.128
146	12.17	0.83	0.160	(0.097)	0.032	0.128
147	12.25	0.83	0.160	(0.096)	0.032	0.128
148	12.33	0.87	0.166	(0.096)	0.033	0.133
149	12.42	0.87	0.166	(0.095)	0.033	0.133
150	12.50	0.87	0.166	(0.095)	0.033	0.133
151	12.58	0.93	0.179	(0.094)	0.036	0.143
152	12.67	0.93	0.179	(0.094)	0.036	0.143
153	12.75	0.93	0.179	(0.093)	0.036	0.143
154	12.83	0.97	0.186	(0.093)	0.037	0.148
155	12.92	0.97	0.186	(0.092)	0.037	0.148
156	13.00	0.97	0.186	(0.092)	0.037	0.148
157	13.08	1.13	0.218	(0.091)	0.044	0.174
158	13.17	1.13	0.218	(0.091)	0.044	0.174
159	13.25	1.13	0.218	(0.091)	0.044	0.174
160	13.33	1.13	0.218	(0.090)	0.044	0.174
161	13.42	1.13	0.218	(0.090)	0.044	0.174
162	13.50	1.13	0.218	(0.089)	0.044	0.174
163	13.58	0.77	0.147	(0.089)	0.029	0.118
164	13.67	0.77	0.147	(0.088)	0.029	0.118
165	13.75	0.77	0.147	(0.088)	0.029	0.118
166	13.83	0.77	0.147	(0.087)	0.029	0.118
167	13.92	0.77	0.147	(0.087)	0.029	0.118
168	14.00	0.77	0.147	(0.086)	0.029	0.118
169	14.08	0.90	0.173	(0.086)	0.035	0.138
170	14.17	0.90	0.173	(0.086)	0.035	0.138
171	14.25	0.90	0.173	(0.085)	0.035	0.138
172	14.33	0.87	0.166	(0.085)	0.033	0.133
173	14.42	0.87	0.166	(0.084)	0.033	0.133
174	14.50	0.87	0.166	(0.084)	0.033	0.133
175	14.58	0.87	0.166	(0.083)	0.033	0.133
176	14.67	0.87	0.166	(0.083)	0.033	0.133
177	14.75	0.87	0.166	(0.083)	0.033	0.133
178	14.83	0.83	0.160	(0.082)	0.032	0.128
179	14.92	0.83	0.160	(0.082)	0.032	0.128

180	15.00	0.83	0.160	(0.081)	0.032	0.128
181	15.08	0.80	0.154	(0.081)	0.031	0.123
182	15.17	0.80	0.154	(0.080)	0.031	0.123
183	15.25	0.80	0.154	(0.080)	0.031	0.123
184	15.33	0.77	0.147	(0.080)	0.029	0.118
185	15.42	0.77	0.147	(0.079)	0.029	0.118
186	15.50	0.77	0.147	(0.079)	0.029	0.118
187	15.58	0.63	0.122	(0.078)	0.024	0.097
188	15.67	0.63	0.122	(0.078)	0.024	0.097
189	15.75	0.63	0.122	(0.078)	0.024	0.097
190	15.83	0.63	0.122	(0.077)	0.024	0.097
191	15.92	0.63	0.122	(0.077)	0.024	0.097
192	16.00	0.63	0.122	(0.076)	0.024	0.097
193	16.08	0.13	0.026	(0.076)	0.005	0.020
194	16.17	0.13	0.026	(0.076)	0.005	0.020
195	16.25	0.13	0.026	(0.075)	0.005	0.020
196	16.33	0.13	0.026	(0.075)	0.005	0.020
197	16.42	0.13	0.026	(0.075)	0.005	0.020
198	16.50	0.13	0.026	(0.074)	0.005	0.020
199	16.58	0.10	0.019	(0.074)	0.004	0.015
200	16.67	0.10	0.019	(0.073)	0.004	0.015
201	16.75	0.10	0.019	(0.073)	0.004	0.015
202	16.83	0.10	0.019	(0.073)	0.004	0.015
203	16.92	0.10	0.019	(0.072)	0.004	0.015
204	17.00	0.10	0.019	(0.072)	0.004	0.015
205	17.08	0.17	0.032	(0.072)	0.006	0.026
206	17.17	0.17	0.032	(0.071)	0.006	0.026
207	17.25	0.17	0.032	(0.071)	0.006	0.026
208	17.33	0.17	0.032	(0.070)	0.006	0.026
209	17.42	0.17	0.032	(0.070)	0.006	0.026
210	17.50	0.17	0.032	(0.070)	0.006	0.026
211	17.58	0.17	0.032	(0.069)	0.006	0.026
212	17.67	0.17	0.032	(0.069)	0.006	0.026
213	17.75	0.17	0.032	(0.069)	0.006	0.026
214	17.83	0.13	0.026	(0.068)	0.005	0.020
215	17.92	0.13	0.026	(0.068)	0.005	0.020
216	18.00	0.13	0.026	(0.068)	0.005	0.020
217	18.08	0.13	0.026	(0.067)	0.005	0.020
218	18.17	0.13	0.026	(0.067)	0.005	0.020
219	18.25	0.13	0.026	(0.067)	0.005	0.020
220	18.33	0.13	0.026	(0.066)	0.005	0.020
221	18.42	0.13	0.026	(0.066)	0.005	0.020
222	18.50	0.13	0.026	(0.066)	0.005	0.020
223	18.58	0.10	0.019	(0.065)	0.004	0.015
224	18.67	0.10	0.019	(0.065)	0.004	0.015
225	18.75	0.10	0.019	(0.065)	0.004	0.015
226	18.83	0.07	0.013	(0.065)	0.003	0.010
227	18.92	0.07	0.013	(0.064)	0.003	0.010
228	19.00	0.07	0.013	(0.064)	0.003	0.010
229	19.08	0.10	0.019	(0.064)	0.004	0.015
230	19.17	0.10	0.019	(0.063)	0.004	0.015
231	19.25	0.10	0.019	(0.063)	0.004	0.015
232	19.33	0.13	0.026	(0.063)	0.005	0.020
233	19.42	0.13	0.026	(0.062)	0.005	0.020
234	19.50	0.13	0.026	(0.062)	0.005	0.020
235	19.58	0.10	0.019	(0.062)	0.004	0.015
236	19.67	0.10	0.019	(0.062)	0.004	0.015
237	19.75	0.10	0.019	(0.061)	0.004	0.015
238	19.83	0.07	0.013	(0.061)	0.003	0.010
239	19.92	0.07	0.013	(0.061)	0.003	0.010
240	20.00	0.07	0.013	(0.060)	0.003	0.010
241	20.08	0.10	0.019	(0.060)	0.004	0.015
242	20.17	0.10	0.019	(0.060)	0.004	0.015
243	20.25	0.10	0.019	(0.060)	0.004	0.015
244	20.33	0.10	0.019	(0.059)	0.004	0.015
245	20.42	0.10	0.019	(0.059)	0.004	0.015
246	20.50	0.10	0.019	(0.059)	0.004	0.015
247	20.58	0.10	0.019	(0.059)	0.004	0.015
248	20.67	0.10	0.019	(0.058)	0.004	0.015
249	20.75	0.10	0.019	(0.058)	0.004	0.015
250	20.83	0.07	0.013	(0.058)	0.003	0.010

251	20.92	0.07	0.013	(0.058)	0.003	0.010
252	21.00	0.07	0.013	(0.057)	0.003	0.010
253	21.08	0.10	0.019	(0.057)	0.004	0.015
254	21.17	0.10	0.019	(0.057)	0.004	0.015
255	21.25	0.10	0.019	(0.057)	0.004	0.015
256	21.33	0.07	0.013	(0.057)	0.003	0.010
257	21.42	0.07	0.013	(0.056)	0.003	0.010
258	21.50	0.07	0.013	(0.056)	0.003	0.010
259	21.58	0.10	0.019	(0.056)	0.004	0.015
260	21.67	0.10	0.019	(0.056)	0.004	0.015
261	21.75	0.10	0.019	(0.056)	0.004	0.015
262	21.83	0.07	0.013	(0.055)	0.003	0.010
263	21.92	0.07	0.013	(0.055)	0.003	0.010
264	22.00	0.07	0.013	(0.055)	0.003	0.010
265	22.08	0.10	0.019	(0.055)	0.004	0.015
266	22.17	0.10	0.019	(0.055)	0.004	0.015
267	22.25	0.10	0.019	(0.054)	0.004	0.015
268	22.33	0.07	0.013	(0.054)	0.003	0.010
269	22.42	0.07	0.013	(0.054)	0.003	0.010
270	22.50	0.07	0.013	(0.054)	0.003	0.010
271	22.58	0.07	0.013	(0.054)	0.003	0.010
272	22.67	0.07	0.013	(0.054)	0.003	0.010
273	22.75	0.07	0.013	(0.053)	0.003	0.010
274	22.83	0.07	0.013	(0.053)	0.003	0.010
275	22.92	0.07	0.013	(0.053)	0.003	0.010
276	23.00	0.07	0.013	(0.053)	0.003	0.010
277	23.08	0.07	0.013	(0.053)	0.003	0.010
278	23.17	0.07	0.013	(0.053)	0.003	0.010
279	23.25	0.07	0.013	(0.053)	0.003	0.010
280	23.33	0.07	0.013	(0.053)	0.003	0.010
281	23.42	0.07	0.013	(0.053)	0.003	0.010
282	23.50	0.07	0.013	(0.052)	0.003	0.010
283	23.58	0.07	0.013	(0.052)	0.003	0.010
284	23.67	0.07	0.013	(0.052)	0.003	0.010
285	23.75	0.07	0.013	(0.052)	0.003	0.010
286	23.83	0.07	0.013	(0.052)	0.003	0.010
287	23.92	0.07	0.013	(0.052)	0.003	0.010
288	24.00	0.07	0.013	(0.052)	0.003	0.010

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.4

Flood volume = Effective rainfall 1.28(In)
times area 4.3(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 0.32(In)
Total soil loss = 0.115(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 20118.7 Cubic Feet
Total soil loss = 5029.7 Cubic Feet

Peak flow rate of this hydrograph = 0.760(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	0.0002	0.03	Q	|	|	|	|
0+10	0.0005	0.04	Q	|	|	|	|
0+15	0.0008	0.04	Q	|	|	|	|
0+20	0.0012	0.06	Q	|	|	|	|
0+25	0.0016	0.07	Q	|	|	|	|
0+30	0.0021	0.07	Q	|	|	|	|
0+35	0.0025	0.07	Q	|	|	|	|
0+40	0.0030	0.07	Q	|	|	|	|
0+45	0.0035	0.07	Q	|	|	|	|
0+50	0.0040	0.08	Q	|	|	|	|
0+55	0.0046	0.09	Q	|	|	|	|
1+ 0	0.0052	0.09	Q	|	|	|	|

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1+ 5        0.0058       0.08  Q          |          |          |          |
1+10        0.0062       0.07  Q          |          |          |          |
1+15        0.0067       0.07  Q          |          |          |          |
1+20        0.0072       0.07  Q          |          |          |          |
1+25        0.0076       0.07  Q          |          |          |          |
1+30        0.0081       0.07  Q          |          |          |          |
1+35        0.0086       0.07  Q          |          |          |          |
1+40        0.0090       0.07  Q          |          |          |          |
1+45        0.0095       0.07  Q          |          |          |          |
1+50        0.0100       0.08  Q          |          |          |          |
1+55        0.0106       0.09  Q          |          |          |          |
2+ 0        0.0112       0.09  Q          |          |          |          |
2+ 5        0.0119       0.09  QV         |          |          |          |
2+10        0.0125       0.09  QV         |          |          |          |
2+15        0.0131       0.09  QV         |          |          |          |
2+20        0.0137       0.09  QV         |          |          |          |
2+25        0.0143       0.09  QV         |          |          |          |
2+30        0.0149       0.09  QV         |          |          |          |
2+35        0.0156       0.10  QV         |          |          |          |
2+40        0.0164       0.11  QV         |          |          |          |
2+45        0.0172       0.11  QV         |          |          |          |
2+50        0.0179       0.11  QV         |          |          |          |
2+55        0.0187       0.11  QV         |          |          |          |
3+ 0        0.0195       0.11  QV         |          |          |          |
3+ 5        0.0203       0.11  QV         |          |          |          |
3+10        0.0210       0.11  QV         |          |          |          |
3+15        0.0218       0.11  QV         |          |          |          |
3+20        0.0226       0.11  QV         |          |          |          |
3+25        0.0233       0.11  Q V        |          |          |          |
3+30        0.0241       0.11  Q V        |          |          |          |
3+35        0.0249       0.11  Q V        |          |          |          |
3+40        0.0256       0.11  Q V        |          |          |          |
3+45        0.0264       0.11  Q V        |          |          |          |
3+50        0.0273       0.12  Q V        |          |          |          |
3+55        0.0282       0.13  Q V        |          |          |          |
4+ 0        0.0291       0.13  Q V        |          |          |          |
4+ 5        0.0300       0.13  Q V        |          |          |          |
4+10        0.0310       0.13  Q V        |          |          |          |
4+15        0.0319       0.13  Q V        |          |          |          |
4+20        0.0329       0.15  Q V        |          |          |          |
4+25        0.0340       0.16  Q V        |          |          |          |
4+30        0.0350       0.16  Q  V       |          |          |          |
4+35        0.0361       0.16  Q  V       |          |          |          |
4+40        0.0372       0.16  Q  V       |          |          |          |
4+45        0.0383       0.16  Q  V       |          |          |          |
4+50        0.0394       0.17  Q  V       |          |          |          |
4+55        0.0407       0.18  Q  V       |          |          |          |
5+ 0        0.0419       0.18  Q  V       |          |          |          |
5+ 5        0.0429       0.15  Q  V       |          |          |          |
5+10        0.0439       0.14  Q  V       |          |          |          |
5+15        0.0448       0.13  Q  V       |          |          |          |
5+20        0.0458       0.15  Q  V       |          |          |          |
5+25        0.0469       0.16  Q   V      |          |          |          |
5+30        0.0480       0.16  Q   V      |          |          |          |
5+35        0.0491       0.17  Q   V      |          |          |          |
5+40        0.0504       0.18  Q   V      |          |          |          |
5+45        0.0516       0.18  Q   V      |          |          |          |
5+50        0.0528       0.18  Q   V      |          |          |          |
5+55        0.0541       0.18  Q   V      |          |          |          |
6+ 0        0.0553       0.18  Q   V      |          |          |          |
6+ 5        0.0566       0.19  Q   V      |          |          |          |
6+10        0.0580       0.20  Q    V     |          |          |          |
6+15        0.0594       0.20  Q    V     |          |          |          |
6+20        0.0608       0.20  Q    V     |          |          |          |
6+25        0.0621       0.20  Q    V     |          |          |          |
6+30        0.0635       0.20  Q    V     |          |          |          |
6+35        0.0650       0.21  Q    V     |          |          |          |
6+40        0.0665       0.22  Q    V     |          |          |          |
6+45        0.0681       0.22  Q    V     |          |          |          |
6+50        0.0696       0.22  Q     V    |          |          |          |
6+55        0.0711       0.22  Q     V    |          |          |          |
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 7+ 0      0.0727      0.22  Q     V   |         |         |         |
 7+ 5      0.0742      0.22  Q     V   |         |         |         |
 7+10      0.0758      0.22  Q     V   |         |         |         |
 7+15      0.0773      0.22  Q     V   |         |         |         |
 7+20      0.0789      0.24  Q     V   |         |         |         |
 7+25      0.0806      0.24  Q     V   |         |         |         |
 7+30      0.0823      0.25  Q      V  |         |         |         |
 7+35      0.0841      0.26  |Q     V  |         |         |         |
 7+40      0.0859      0.27  |Q     V  |         |         |         |
 7+45      0.0878      0.27  |Q     V  |         |         |         |
 7+50      0.0897      0.28  |Q     V  |         |         |         |
 7+55      0.0917      0.29  |Q     V  |         |         |         |
 8+ 0      0.0937      0.29  |Q      V |         |         |         |
 8+ 5      0.0959      0.32  |Q      V |         |         |         |
 8+10      0.0982      0.33  |Q      V |         |         |         |
 8+15      0.1005      0.34  |Q      V |         |         |         |
 8+20      0.1028      0.34  |Q      V |         |         |         |
 8+25      0.1051      0.34  |Q       V|         |         |         |
 8+30      0.1074      0.34  |Q       V|         |         |         |
 8+35      0.1098      0.35  |Q       V|         |         |         |
 8+40      0.1123      0.36  |Q       V|         |         |         |
 8+45      0.1147      0.36  |Q       V|         |         |         |
 8+50      0.1173      0.37  |Q        V         |         |         |
 8+55      0.1199      0.38  |Q        V         |         |         |
 9+ 0      0.1225      0.38  |Q        V         |         |         |
 9+ 5      0.1253      0.41  |Q        V         |         |         |
 9+10      0.1282      0.42  |Q        |V        |         |         |
 9+15      0.1311      0.42  |Q        |V        |         |         |
 9+20      0.1341      0.44  |Q        |V        |         |         |
 9+25      0.1372      0.45  |Q        |V        |         |         |
 9+30      0.1403      0.45  |Q        | V       |         |         |
 9+35      0.1435      0.46  |Q        | V       |         |         |
 9+40      0.1467      0.47  |Q        | V       |         |         |
 9+45      0.1499      0.47  |Q        | V       |         |         |
 9+50      0.1532      0.48  |Q        |  V      |         |         |
 9+55      0.1566      0.49  |Q        |  V      |         |         |
10+ 0      0.1600      0.49  |Q        |  V      |         |         |
10+ 5      0.1628      0.40  |Q        |   V     |         |         |
10+10      0.1651      0.34  |Q        |   V     |         |         |
10+15      0.1675      0.34  |Q        |   V     |         |         |
10+20      0.1698      0.34  |Q        |   V     |         |         |
10+25      0.1721      0.34  |Q        |   V     |         |         |
10+30      0.1744      0.34  |Q        |    V    |         |         |
10+35      0.1771      0.40  |Q        |    V    |         |         |
10+40      0.1802      0.44  |Q        |    V    |         |         |
10+45      0.1832      0.45  |Q        |    V    |         |         |
10+50      0.1863      0.45  |Q        |     V   |         |         |
10+55      0.1894      0.45  |Q        |     V   |         |         |
11+ 0      0.1925      0.45  |Q        |     V   |         |         |
11+ 5      0.1955      0.43  |Q        |     V   |         |         |
11+10      0.1984      0.43  |Q        |      V  |         |         |
11+15      0.2013      0.42  |Q        |      V  |         |         |
11+20      0.2043      0.42  |Q        |      V  |         |         |
11+25      0.2072      0.42  |Q        |      V  |         |         |
11+30      0.2101      0.42  |Q        |       V |         |         |
11+35      0.2129      0.40  |Q        |       V |         |         |
11+40      0.2155      0.38  |Q        |       V |         |         |
11+45      0.2181      0.38  |Q        |       V |         |         |
11+50      0.2208      0.39  |Q        |        V|         |         |
11+55      0.2236      0.40  |Q        |        V|         |         |
12+ 0      0.2264      0.40  |Q        |        V|         |         |
12+ 5      0.2297      0.49  |Q        |        V|         |         |
12+10      0.2335      0.55  | Q       |         V         |         |
12+15      0.2374      0.56  | Q       |         V         |         |
12+20      0.2413      0.57  | Q       |         V         |         |
12+25      0.2453      0.58  | Q       |         |V        |         |
12+30      0.2493      0.58  | Q       |         |V        |         |
12+35      0.2535      0.61  | Q       |         |V        |         |
12+40      0.2578      0.62  | Q       |         | V       |         |
12+45      0.2621      0.63  | Q       |         | V       |         |
12+50      0.2665      0.64  | Q       |         |  V      |         |
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12+55      0.2709      0.65  | Q       |         |  V      |         |
13+ 0      0.2754      0.65  | Q       |         |  V      |         |
13+ 5      0.2803      0.71  | Q       |         |   V     |         |
13+10      0.2855      0.75  |  Q      |         |   V     |         |
13+15      0.2907      0.76  |  Q      |         |    V    |         |
13+20      0.2960      0.76  |  Q      |         |    V    |         |
13+25      0.3012      0.76  |  Q      |         |     V   |         |
13+30      0.3064      0.76  |  Q      |         |     V   |         |
13+35      0.3107      0.62  | Q       |         |     V   |         |
13+40      0.3143      0.53  | Q       |         |      V  |         |
13+45      0.3179      0.51  | Q       |         |      V  |         |
13+50      0.3214      0.51  | Q       |         |      V  |         |
13+55      0.3250      0.51  | Q       |         |       V |         |
14+ 0      0.3285      0.51  | Q       |         |       V |         |
14+ 5      0.3324      0.57  | Q       |         |       V |         |
14+10      0.3365      0.60  | Q       |         |        V|         |
14+15      0.3407      0.60  | Q       |         |        V|         |
14+20      0.3447      0.59  | Q       |         |        V|         |
14+25      0.3488      0.58  | Q       |         |         V         |
14+30      0.3528      0.58  | Q       |         |         V         |
14+35      0.3568      0.58  | Q       |         |         V         |
14+40      0.3608      0.58  | Q       |         |         |V        |
14+45      0.3648      0.58  | Q       |         |         |V        |
14+50      0.3687      0.57  | Q       |         |         |V        |
14+55      0.3725      0.56  | Q       |         |         | V       |
15+ 0      0.3764      0.56  | Q       |         |         | V       |
15+ 5      0.3802      0.55  | Q       |         |         | V       |
15+10      0.3839      0.54  | Q       |         |         |  V      |
15+15      0.3876      0.54  | Q       |         |         |  V      |
15+20      0.3912      0.52  | Q       |         |         |  V      |
15+25      0.3947      0.52  | Q       |         |         |   V     |
15+30      0.3983      0.51  | Q       |         |         |   V     |
15+35      0.4014      0.46  |Q        |         |         |   V     |
15+40      0.4044      0.43  |Q        |         |         |    V    |
15+45      0.4073      0.42  |Q        |         |         |    V    |
15+50      0.4103      0.42  |Q        |         |         |    V    |
15+55      0.4132      0.42  |Q        |         |         |    V    |
16+ 0      0.4161      0.42  |Q        |         |         |     V   |
16+ 5      0.4177      0.23  Q         |         |         |     V   |
16+10      0.4185      0.11  Q         |         |         |     V   |
16+15      0.4191      0.09  Q         |         |         |     V   |
16+20      0.4197      0.09  Q         |         |         |     V   |
16+25      0.4203      0.09  Q         |         |         |     V   |
16+30      0.4209      0.09  Q         |         |         |     V   |
16+35      0.4214      0.08  Q         |         |         |     V   |
16+40      0.4219      0.07  Q         |         |         |     V   |
16+45      0.4224      0.07  Q         |         |         |     V   |
16+50      0.4228      0.07  Q         |         |         |     V   |
16+55      0.4233      0.07  Q         |         |         |     V   |
17+ 0      0.4238      0.07  Q         |         |         |     V   |
17+ 5      0.4244      0.09  Q         |         |         |     V   |
17+10      0.4252      0.11  Q         |         |         |     V   |
17+15      0.4259      0.11  Q         |         |         |     V   |
17+20      0.4267      0.11  Q         |         |         |     V   |
17+25      0.4275      0.11  Q         |         |         |      V  |
17+30      0.4282      0.11  Q         |         |         |      V  |
17+35      0.4290      0.11  Q         |         |         |      V  |
17+40      0.4298      0.11  Q         |         |         |      V  |
17+45      0.4305      0.11  Q         |         |         |      V  |
17+50      0.4312      0.10  Q         |         |         |      V  |
17+55      0.4319      0.09  Q         |         |         |      V  |
18+ 0      0.4325      0.09  Q         |         |         |      V  |
18+ 5      0.4331      0.09  Q         |         |         |      V  |
18+10      0.4337      0.09  Q         |         |         |      V  |
18+15      0.4343      0.09  Q         |         |         |      V  |
18+20      0.4349      0.09  Q         |         |         |      V  |
18+25      0.4355      0.09  Q         |         |         |      V  |
18+30      0.4362      0.09  Q         |         |         |      V  |
18+35      0.4367      0.08  Q         |         |         |      V  |
18+40      0.4372      0.07  Q         |         |         |      V  |
18+45      0.4376      0.07  Q         |         |         |      V  |
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  18+50       0.4380      0.05  Q          |          |          |       V  |
  18+55       0.4383      0.05  Q          |          |          |       V  |
  19+ 0       0.4386      0.04  Q          |          |          |       V  |
  19+ 5       0.4390      0.06  Q          |          |          |        V |
  19+10       0.4395      0.07  Q          |          |          |        V |
  19+15       0.4399      0.07  Q          |          |          |        V |
  19+20       0.4405      0.08  Q          |          |          |        V |
  19+25       0.4411      0.09  Q          |          |          |        V |
  19+30       0.4417      0.09  Q          |          |          |        V |
  19+35       0.4422      0.08  Q          |          |          |        V |
  19+40       0.4427      0.07  Q          |          |          |        V |
  19+45       0.4432      0.07  Q          |          |          |        V |
  19+50       0.4435      0.05  Q          |          |          |        V |
  19+55       0.4439      0.05  Q          |          |          |        V |
  20+ 0       0.4442      0.04  Q          |          |          |        V |
  20+ 5       0.4446      0.06  Q          |          |          |        V |
  20+10       0.4450      0.07  Q          |          |          |        V |
  20+15       0.4455      0.07  Q          |          |          |        V |
  20+20       0.4459      0.07  Q          |          |          |        V |
  20+25       0.4464      0.07  Q          |          |          |        V |
  20+30       0.4469      0.07  Q          |          |          |        V |
  20+35       0.4473      0.07  Q          |          |          |        V |
  20+40       0.4478      0.07  Q          |          |          |        V |
  20+45       0.4482      0.07  Q          |          |          |        V |
  20+50       0.4486      0.05  Q          |          |          |        V |
  20+55       0.4489      0.05  Q          |          |          |        V |
  21+ 0       0.4492      0.04  Q          |          |          |        V |
  21+ 5       0.4496      0.06  Q          |          |          |        V |
  21+10       0.4501      0.07  Q          |          |          |        V |
  21+15       0.4506      0.07  Q          |          |          |         V|
  21+20       0.4509      0.05  Q          |          |          |         V|
  21+25       0.4512      0.05  Q          |          |          |         V|
  21+30       0.4516      0.04  Q          |          |          |         V|
  21+35       0.4519      0.06  Q          |          |          |         V|
  21+40       0.4524      0.07  Q          |          |          |         V|
  21+45       0.4529      0.07  Q          |          |          |         V|
  21+50       0.4532      0.05  Q          |          |          |         V|
  21+55       0.4536      0.05  Q          |          |          |         V|
  22+ 0       0.4539      0.04  Q          |          |          |         V|
  22+ 5       0.4543      0.06  Q          |          |          |         V|
  22+10       0.4547      0.07  Q          |          |          |         V|
  22+15       0.4552      0.07  Q          |          |          |         V|
  22+20       0.4555      0.05  Q          |          |          |         V|
  22+25       0.4559      0.05  Q          |          |          |         V|
  22+30       0.4562      0.04  Q          |          |          |         V|
  22+35       0.4565      0.04  Q          |          |          |         V|
  22+40       0.4568      0.04  Q          |          |          |         V|
  22+45       0.4571      0.04  Q          |          |          |         V|
  22+50       0.4574      0.04  Q          |          |          |         V|
  22+55       0.4577      0.04  Q          |          |          |         V|
  23+ 0       0.4580      0.04  Q          |          |          |         V|
  23+ 5       0.4583      0.04  Q          |          |          |         V|
  23+10       0.4586      0.04  Q          |          |          |         V|
  23+15       0.4589      0.04  Q          |          |          |         V|
  23+20       0.4592      0.04  Q          |          |          |         V|
  23+25       0.4596      0.04  Q          |          |          |         V|
  23+30       0.4599      0.04  Q          |          |          |         V|
  23+35       0.4602      0.04  Q          |          |          |         V|
  23+40       0.4605      0.04  Q          |          |          |         V|
  23+45       0.4608      0.04  Q          |          |          |         V|
  23+50       0.4611      0.04  Q          |          |          |         V|
  23+55       0.4614      0.04  Q          |          |          |         V|
  24+ 0       0.4617      0.04  Q          |          |          |         V|
  24+ 5       0.4618      0.02  Q          |          |          |         V|
  24+10       0.4619      0.00  Q          |          |          |         V|
-----------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/04/22 File: 19004DEVHYD2410.out

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

Program License Serial Number 6106

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

English Units used in output format

19-004 DEVELOPED CONDITION HYDROGRAPH METHOD 10 YEAR 24 HOUR EVENT

Drainage Area = 4.33(Ac.) = 0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.33(Ac.) = 0.007 Sq. Mi.
Length along longest watercourse = 812.30(Ft.)
Length along longest watercourse measured to centroid = 207.60(Ft.)
Length along longest watercourse = 0.154 Mi.
Length along longest watercourse measured to centroid = 0.039 Mi.
Difference in elevation = 4.47(Ft.)
Slope along watercourse = 29.0553 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.027 Hr.
Lag time = 1.63 Min.
25% of lag time = 0.41 Min.
40% of lag time = 0.65 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]
4.33	1.60	6.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.33	4.10	17.75

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.600(In)
Area Averaged 100-Year Rainfall = 4.100(In)

Point rain (area averaged) = 2.629(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.628(In)

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

4.330	75.00	0.880

Total Area Entered = 4.33(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
75.0	75.0	0.303	0.880	0.063	1.000	0.063
					Sum (F) =	0.063

Area averaged mean soil loss (F) (In/Hr) = 0.063
Minimum soil loss rate ((In/Hr)) = 0.032
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.200

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

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	305.838	57.272	2.499
2	0.167	611.677	36.809	1.606
3	0.250	917.515	5.919	0.258
			Sum = 100.000	Sum= 4.364

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.021	(0.112)	0.004	0.017
2	0.17	0.07	0.021	(0.111)	0.004	0.017
3	0.25	0.07	0.021	(0.111)	0.004	0.017
4	0.33	0.10	0.032	(0.110)	0.006	0.025
5	0.42	0.10	0.032	(0.110)	0.006	0.025
6	0.50	0.10	0.032	(0.110)	0.006	0.025
7	0.58	0.10	0.032	(0.109)	0.006	0.025
8	0.67	0.10	0.032	(0.109)	0.006	0.025
9	0.75	0.10	0.032	(0.108)	0.006	0.025
10	0.83	0.13	0.042	(0.108)	0.008	0.034
11	0.92	0.13	0.042	(0.107)	0.008	0.034
12	1.00	0.13	0.042	(0.107)	0.008	0.034
13	1.08	0.10	0.032	(0.107)	0.006	0.025
14	1.17	0.10	0.032	(0.106)	0.006	0.025
15	1.25	0.10	0.032	(0.106)	0.006	0.025
16	1.33	0.10	0.032	(0.105)	0.006	0.025
17	1.42	0.10	0.032	(0.105)	0.006	0.025
18	1.50	0.10	0.032	(0.104)	0.006	0.025
19	1.58	0.10	0.032	(0.104)	0.006	0.025
20	1.67	0.10	0.032	(0.104)	0.006	0.025
21	1.75	0.10	0.032	(0.103)	0.006	0.025
22	1.83	0.13	0.042	(0.103)	0.008	0.034
23	1.92	0.13	0.042	(0.102)	0.008	0.034
24	2.00	0.13	0.042	(0.102)	0.008	0.034
25	2.08	0.13	0.042	(0.102)	0.008	0.034
26	2.17	0.13	0.042	(0.101)	0.008	0.034
27	2.25	0.13	0.042	(0.101)	0.008	0.034
28	2.33	0.13	0.042	(0.100)	0.008	0.034
29	2.42	0.13	0.042	(0.100)	0.008	0.034
30	2.50	0.13	0.042	(0.100)	0.008	0.034
31	2.58	0.17	0.053	(0.099)	0.011	0.042
32	2.67	0.17	0.053	(0.099)	0.011	0.042
33	2.75	0.17	0.053	(0.098)	0.011	0.042
34	2.83	0.17	0.053	(0.098)	0.011	0.042
35	2.92	0.17	0.053	(0.098)	0.011	0.042
36	3.00	0.17	0.053	(0.097)	0.011	0.042
37	3.08	0.17	0.053	(0.097)	0.011	0.042

38	3.17	0.17	0.053	(0.096)	0.011	0.042
39	3.25	0.17	0.053	(0.096)	0.011	0.042
40	3.33	0.17	0.053	(0.096)	0.011	0.042
41	3.42	0.17	0.053	(0.095)	0.011	0.042
42	3.50	0.17	0.053	(0.095)	0.011	0.042
43	3.58	0.17	0.053	(0.094)	0.011	0.042
44	3.67	0.17	0.053	(0.094)	0.011	0.042
45	3.75	0.17	0.053	(0.094)	0.011	0.042
46	3.83	0.20	0.063	(0.093)	0.013	0.050
47	3.92	0.20	0.063	(0.093)	0.013	0.050
48	4.00	0.20	0.063	(0.092)	0.013	0.050
49	4.08	0.20	0.063	(0.092)	0.013	0.050
50	4.17	0.20	0.063	(0.092)	0.013	0.050
51	4.25	0.20	0.063	(0.091)	0.013	0.050
52	4.33	0.23	0.074	(0.091)	0.015	0.059
53	4.42	0.23	0.074	(0.090)	0.015	0.059
54	4.50	0.23	0.074	(0.090)	0.015	0.059
55	4.58	0.23	0.074	(0.090)	0.015	0.059
56	4.67	0.23	0.074	(0.089)	0.015	0.059
57	4.75	0.23	0.074	(0.089)	0.015	0.059
58	4.83	0.27	0.084	(0.088)	0.017	0.067
59	4.92	0.27	0.084	(0.088)	0.017	0.067
60	5.00	0.27	0.084	(0.088)	0.017	0.067
61	5.08	0.20	0.063	(0.087)	0.013	0.050
62	5.17	0.20	0.063	(0.087)	0.013	0.050
63	5.25	0.20	0.063	(0.087)	0.013	0.050
64	5.33	0.23	0.074	(0.086)	0.015	0.059
65	5.42	0.23	0.074	(0.086)	0.015	0.059
66	5.50	0.23	0.074	(0.085)	0.015	0.059
67	5.58	0.27	0.084	(0.085)	0.017	0.067
68	5.67	0.27	0.084	(0.085)	0.017	0.067
69	5.75	0.27	0.084	(0.084)	0.017	0.067
70	5.83	0.27	0.084	(0.084)	0.017	0.067
71	5.92	0.27	0.084	(0.084)	0.017	0.067
72	6.00	0.27	0.084	(0.083)	0.017	0.067
73	6.08	0.30	0.095	(0.083)	0.019	0.076
74	6.17	0.30	0.095	(0.082)	0.019	0.076
75	6.25	0.30	0.095	(0.082)	0.019	0.076
76	6.33	0.30	0.095	(0.082)	0.019	0.076
77	6.42	0.30	0.095	(0.081)	0.019	0.076
78	6.50	0.30	0.095	(0.081)	0.019	0.076
79	6.58	0.33	0.105	(0.081)	0.021	0.084
80	6.67	0.33	0.105	(0.080)	0.021	0.084
81	6.75	0.33	0.105	(0.080)	0.021	0.084
82	6.83	0.33	0.105	(0.080)	0.021	0.084
83	6.92	0.33	0.105	(0.079)	0.021	0.084
84	7.00	0.33	0.105	(0.079)	0.021	0.084
85	7.08	0.33	0.105	(0.078)	0.021	0.084
86	7.17	0.33	0.105	(0.078)	0.021	0.084
87	7.25	0.33	0.105	(0.078)	0.021	0.084
88	7.33	0.37	0.116	(0.077)	0.023	0.093
89	7.42	0.37	0.116	(0.077)	0.023	0.093
90	7.50	0.37	0.116	(0.077)	0.023	0.093
91	7.58	0.40	0.126	(0.076)	0.025	0.101
92	7.67	0.40	0.126	(0.076)	0.025	0.101
93	7.75	0.40	0.126	(0.076)	0.025	0.101
94	7.83	0.43	0.137	(0.075)	0.027	0.109
95	7.92	0.43	0.137	(0.075)	0.027	0.109
96	8.00	0.43	0.137	(0.075)	0.027	0.109
97	8.08	0.50	0.158	(0.074)	0.032	0.126
98	8.17	0.50	0.158	(0.074)	0.032	0.126
99	8.25	0.50	0.158	(0.074)	0.032	0.126
100	8.33	0.50	0.158	(0.073)	0.032	0.126
101	8.42	0.50	0.158	(0.073)	0.032	0.126
102	8.50	0.50	0.158	(0.073)	0.032	0.126
103	8.58	0.53	0.168	(0.072)	0.034	0.135
104	8.67	0.53	0.168	(0.072)	0.034	0.135
105	8.75	0.53	0.168	(0.072)	0.034	0.135
106	8.83	0.57	0.179	(0.071)	0.036	0.143
107	8.92	0.57	0.179	(0.071)	0.036	0.143
108	9.00	0.57	0.179	(0.070)	0.036	0.143

109	9.08	0.63	0.200	(0.070)	0.040	0.160
110	9.17	0.63	0.200	(0.070)	0.040	0.160
111	9.25	0.63	0.200	(0.069)	0.040	0.160
112	9.33	0.67	0.210	(0.069)	0.042	0.168
113	9.42	0.67	0.210	(0.069)	0.042	0.168
114	9.50	0.67	0.210	(0.069)	0.042	0.168
115	9.58	0.70	0.221	(0.068)	0.044	0.177
116	9.67	0.70	0.221	(0.068)	0.044	0.177
117	9.75	0.70	0.221	(0.068)	0.044	0.177
118	9.83	0.73	0.231	(0.067)	0.046	0.185
119	9.92	0.73	0.231	(0.067)	0.046	0.185
120	10.00	0.73	0.231	(0.067)	0.046	0.185
121	10.08	0.50	0.158	(0.066)	0.032	0.126
122	10.17	0.50	0.158	(0.066)	0.032	0.126
123	10.25	0.50	0.158	(0.066)	0.032	0.126
124	10.33	0.50	0.158	(0.065)	0.032	0.126
125	10.42	0.50	0.158	(0.065)	0.032	0.126
126	10.50	0.50	0.158	(0.065)	0.032	0.126
127	10.58	0.67	0.210	(0.064)	0.042	0.168
128	10.67	0.67	0.210	(0.064)	0.042	0.168
129	10.75	0.67	0.210	(0.064)	0.042	0.168
130	10.83	0.67	0.210	(0.063)	0.042	0.168
131	10.92	0.67	0.210	(0.063)	0.042	0.168
132	11.00	0.67	0.210	(0.063)	0.042	0.168
133	11.08	0.63	0.200	(0.062)	0.040	0.160
134	11.17	0.63	0.200	(0.062)	0.040	0.160
135	11.25	0.63	0.200	(0.062)	0.040	0.160
136	11.33	0.63	0.200	(0.062)	0.040	0.160
137	11.42	0.63	0.200	(0.061)	0.040	0.160
138	11.50	0.63	0.200	(0.061)	0.040	0.160
139	11.58	0.57	0.179	(0.061)	0.036	0.143
140	11.67	0.57	0.179	(0.060)	0.036	0.143
141	11.75	0.57	0.179	(0.060)	0.036	0.143
142	11.83	0.60	0.189	(0.060)	0.038	0.151
143	11.92	0.60	0.189	(0.059)	0.038	0.151
144	12.00	0.60	0.189	(0.059)	0.038	0.151
145	12.08	0.83	0.263	(0.059)	0.053	0.210
146	12.17	0.83	0.263	(0.059)	0.053	0.210
147	12.25	0.83	0.263	(0.058)	0.053	0.210
148	12.33	0.87	0.273	(0.058)	0.055	0.219
149	12.42	0.87	0.273	(0.058)	0.055	0.219
150	12.50	0.87	0.273	(0.057)	0.055	0.219
151	12.58	0.93	0.294	0.057	(0.059)	0.237
152	12.67	0.93	0.294	0.057	(0.059)	0.238
153	12.75	0.93	0.294	0.057	(0.059)	0.238
154	12.83	0.97	0.305	0.056	(0.061)	0.249
155	12.92	0.97	0.305	0.056	(0.061)	0.249
156	13.00	0.97	0.305	0.056	(0.061)	0.249
157	13.08	1.13	0.357	0.055	(0.071)	0.302
158	13.17	1.13	0.357	0.055	(0.071)	0.302
159	13.25	1.13	0.357	0.055	(0.071)	0.303
160	13.33	1.13	0.357	0.055	(0.071)	0.303
161	13.42	1.13	0.357	0.054	(0.071)	0.303
162	13.50	1.13	0.357	0.054	(0.071)	0.303
163	13.58	0.77	0.242	(0.054)	0.048	0.193
164	13.67	0.77	0.242	(0.053)	0.048	0.193
165	13.75	0.77	0.242	(0.053)	0.048	0.193
166	13.83	0.77	0.242	(0.053)	0.048	0.193
167	13.92	0.77	0.242	(0.053)	0.048	0.193
168	14.00	0.77	0.242	(0.052)	0.048	0.193
169	14.08	0.90	0.284	0.052	(0.057)	0.232
170	14.17	0.90	0.284	0.052	(0.057)	0.232
171	14.25	0.90	0.284	0.052	(0.057)	0.232
172	14.33	0.87	0.273	0.051	(0.055)	0.222
173	14.42	0.87	0.273	0.051	(0.055)	0.222
174	14.50	0.87	0.273	0.051	(0.055)	0.223
175	14.58	0.87	0.273	0.051	(0.055)	0.223
176	14.67	0.87	0.273	0.050	(0.055)	0.223
177	14.75	0.87	0.273	0.050	(0.055)	0.223
178	14.83	0.83	0.263	0.050	(0.053)	0.213
179	14.92	0.83	0.263	0.049	(0.053)	0.213

180	15.00	0.83	0.263	0.049	(0.053)	0.214
181	15.08	0.80	0.252	0.049	(0.050)	0.203
182	15.17	0.80	0.252	0.049	(0.050)	0.204
183	15.25	0.80	0.252	0.048	(0.050)	0.204
184	15.33	0.77	0.242	0.048	(0.048)	0.194
185	15.42	0.77	0.242	0.048	(0.048)	0.194
186	15.50	0.77	0.242	0.048	(0.048)	0.194
187	15.58	0.63	0.200	(0.047)	0.040	0.160
188	15.67	0.63	0.200	(0.047)	0.040	0.160
189	15.75	0.63	0.200	(0.047)	0.040	0.160
190	15.83	0.63	0.200	(0.047)	0.040	0.160
191	15.92	0.63	0.200	(0.047)	0.040	0.160
192	16.00	0.63	0.200	(0.046)	0.040	0.160
193	16.08	0.13	0.042	(0.046)	0.008	0.034
194	16.17	0.13	0.042	(0.046)	0.008	0.034
195	16.25	0.13	0.042	(0.046)	0.008	0.034
196	16.33	0.13	0.042	(0.045)	0.008	0.034
197	16.42	0.13	0.042	(0.045)	0.008	0.034
198	16.50	0.13	0.042	(0.045)	0.008	0.034
199	16.58	0.10	0.032	(0.045)	0.006	0.025
200	16.67	0.10	0.032	(0.044)	0.006	0.025
201	16.75	0.10	0.032	(0.044)	0.006	0.025
202	16.83	0.10	0.032	(0.044)	0.006	0.025
203	16.92	0.10	0.032	(0.044)	0.006	0.025
204	17.00	0.10	0.032	(0.044)	0.006	0.025
205	17.08	0.17	0.053	(0.043)	0.011	0.042
206	17.17	0.17	0.053	(0.043)	0.011	0.042
207	17.25	0.17	0.053	(0.043)	0.011	0.042
208	17.33	0.17	0.053	(0.043)	0.011	0.042
209	17.42	0.17	0.053	(0.042)	0.011	0.042
210	17.50	0.17	0.053	(0.042)	0.011	0.042
211	17.58	0.17	0.053	(0.042)	0.011	0.042
212	17.67	0.17	0.053	(0.042)	0.011	0.042
213	17.75	0.17	0.053	(0.042)	0.011	0.042
214	17.83	0.13	0.042	(0.041)	0.008	0.034
215	17.92	0.13	0.042	(0.041)	0.008	0.034
216	18.00	0.13	0.042	(0.041)	0.008	0.034
217	18.08	0.13	0.042	(0.041)	0.008	0.034
218	18.17	0.13	0.042	(0.041)	0.008	0.034
219	18.25	0.13	0.042	(0.040)	0.008	0.034
220	18.33	0.13	0.042	(0.040)	0.008	0.034
221	18.42	0.13	0.042	(0.040)	0.008	0.034
222	18.50	0.13	0.042	(0.040)	0.008	0.034
223	18.58	0.10	0.032	(0.040)	0.006	0.025
224	18.67	0.10	0.032	(0.039)	0.006	0.025
225	18.75	0.10	0.032	(0.039)	0.006	0.025
226	18.83	0.07	0.021	(0.039)	0.004	0.017
227	18.92	0.07	0.021	(0.039)	0.004	0.017
228	19.00	0.07	0.021	(0.039)	0.004	0.017
229	19.08	0.10	0.032	(0.038)	0.006	0.025
230	19.17	0.10	0.032	(0.038)	0.006	0.025
231	19.25	0.10	0.032	(0.038)	0.006	0.025
232	19.33	0.13	0.042	(0.038)	0.008	0.034
233	19.42	0.13	0.042	(0.038)	0.008	0.034
234	19.50	0.13	0.042	(0.038)	0.008	0.034
235	19.58	0.10	0.032	(0.037)	0.006	0.025
236	19.67	0.10	0.032	(0.037)	0.006	0.025
237	19.75	0.10	0.032	(0.037)	0.006	0.025
238	19.83	0.07	0.021	(0.037)	0.004	0.017
239	19.92	0.07	0.021	(0.037)	0.004	0.017
240	20.00	0.07	0.021	(0.037)	0.004	0.017
241	20.08	0.10	0.032	(0.036)	0.006	0.025
242	20.17	0.10	0.032	(0.036)	0.006	0.025
243	20.25	0.10	0.032	(0.036)	0.006	0.025
244	20.33	0.10	0.032	(0.036)	0.006	0.025
245	20.42	0.10	0.032	(0.036)	0.006	0.025
246	20.50	0.10	0.032	(0.036)	0.006	0.025
247	20.58	0.10	0.032	(0.036)	0.006	0.025
248	20.67	0.10	0.032	(0.035)	0.006	0.025
249	20.75	0.10	0.032	(0.035)	0.006	0.025
250	20.83	0.07	0.021	(0.035)	0.004	0.017

251	20.92	0.07	0.021	(0.035)	0.004	0.017
252	21.00	0.07	0.021	(0.035)	0.004	0.017
253	21.08	0.10	0.032	(0.035)	0.006	0.025
254	21.17	0.10	0.032	(0.035)	0.006	0.025
255	21.25	0.10	0.032	(0.034)	0.006	0.025
256	21.33	0.07	0.021	(0.034)	0.004	0.017
257	21.42	0.07	0.021	(0.034)	0.004	0.017
258	21.50	0.07	0.021	(0.034)	0.004	0.017
259	21.58	0.10	0.032	(0.034)	0.006	0.025
260	21.67	0.10	0.032	(0.034)	0.006	0.025
261	21.75	0.10	0.032	(0.034)	0.006	0.025
262	21.83	0.07	0.021	(0.034)	0.004	0.017
263	21.92	0.07	0.021	(0.033)	0.004	0.017
264	22.00	0.07	0.021	(0.033)	0.004	0.017
265	22.08	0.10	0.032	(0.033)	0.006	0.025
266	22.17	0.10	0.032	(0.033)	0.006	0.025
267	22.25	0.10	0.032	(0.033)	0.006	0.025
268	22.33	0.07	0.021	(0.033)	0.004	0.017
269	22.42	0.07	0.021	(0.033)	0.004	0.017
270	22.50	0.07	0.021	(0.033)	0.004	0.017
271	22.58	0.07	0.021	(0.033)	0.004	0.017
272	22.67	0.07	0.021	(0.032)	0.004	0.017
273	22.75	0.07	0.021	(0.032)	0.004	0.017
274	22.83	0.07	0.021	(0.032)	0.004	0.017
275	22.92	0.07	0.021	(0.032)	0.004	0.017
276	23.00	0.07	0.021	(0.032)	0.004	0.017
277	23.08	0.07	0.021	(0.032)	0.004	0.017
278	23.17	0.07	0.021	(0.032)	0.004	0.017
279	23.25	0.07	0.021	(0.032)	0.004	0.017
280	23.33	0.07	0.021	(0.032)	0.004	0.017
281	23.42	0.07	0.021	(0.032)	0.004	0.017
282	23.50	0.07	0.021	(0.032)	0.004	0.017
283	23.58	0.07	0.021	(0.032)	0.004	0.017
284	23.67	0.07	0.021	(0.032)	0.004	0.017
285	23.75	0.07	0.021	(0.032)	0.004	0.017
286	23.83	0.07	0.021	(0.032)	0.004	0.017
287	23.92	0.07	0.021	(0.032)	0.004	0.017
288	24.00	0.07	0.021	(0.032)	0.004	0.017

(Loss Rate Not Used)

Sum = 100.0 Sum = 25.4

Flood volume = Effective rainfall 2.12(In)
times area 4.3(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 0.51(In)
Total soil loss = 0.184(Ac.Ft)
Total rainfall = 2.63(In)
Flood volume = 33283.5 Cubic Feet
Total soil loss = 8031.0 Cubic Feet

Peak flow rate of this hydrograph = 1.324(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	0.04	Q	|	|	|	|
0+10	0.0008	0.07	Q	|	|	|	|
0+15	0.0013	0.07	Q	|	|	|	|
0+20	0.0019	0.09	Q	|	|	|	|
0+25	0.0027	0.11	Q	|	|	|	|
0+30	0.0034	0.11	Q	|	|	|	|
0+35	0.0042	0.11	Q	|	|	|	|
0+40	0.0049	0.11	Q	|	|	|	|
0+45	0.0057	0.11	Q	|	|	|	|
0+50	0.0066	0.13	Q	|	|	|	|
0+55	0.0076	0.14	Q	|	|	|	|
1+ 0	0.0086	0.15	Q	|	|	|	|

1+ 5	0.0095	0.13	Q	|	|	|	|
1+10	0.0103	0.11	Q	|	|	|	|
1+15	0.0110	0.11	Q	|	|	|	|
1+20	0.0118	0.11	Q	|	|	|	|
1+25	0.0125	0.11	Q	|	|	|	|
1+30	0.0133	0.11	Q	|	|	|	|
1+35	0.0140	0.11	Q	|	|	|	|
1+40	0.0148	0.11	Q	|	|	|	|
1+45	0.0156	0.11	Q	|	|	|	|
1+50	0.0165	0.13	Q	|	|	|	|
1+55	0.0175	0.14	Q	|	|	|	|
2+ 0	0.0185	0.15	Q	|	|	|	|
2+ 5	0.0195	0.15	QV	|	|	|	|
2+10	0.0205	0.15	QV	|	|	|	|
2+15	0.0215	0.15	QV	|	|	|	|
2+20	0.0225	0.15	QV	|	|	|	|
2+25	0.0235	0.15	QV	|	|	|	|
2+30	0.0245	0.15	QV	|	|	|	|
2+35	0.0257	0.17	QV	|	|	|	|
2+40	0.0270	0.18	QV	|	|	|	|
2+45	0.0282	0.18	QV	|	|	|	|
2+50	0.0295	0.18	QV	|	|	|	|
2+55	0.0307	0.18	QV	|	|	|	|
3+ 0	0.0320	0.18	QV	|	|	|	|
3+ 5	0.0333	0.18	QV	|	|	|	|
3+10	0.0345	0.18	QV	|	|	|	|
3+15	0.0358	0.18	QV	|	|	|	|
3+20	0.0371	0.18	QV	|	|	|	|
3+25	0.0383	0.18	Q V	|	|	|	|
3+30	0.0396	0.18	Q V	|	|	|	|
3+35	0.0409	0.18	Q V	|	|	|	|
3+40	0.0421	0.18	Q V	|	|	|	|
3+45	0.0434	0.18	Q V	|	|	|	|
3+50	0.0448	0.20	Q V	|	|	|	|
3+55	0.0463	0.22	Q V	|	|	|	|
4+ 0	0.0478	0.22	Q V	|	|	|	|
4+ 5	0.0493	0.22	Q V	|	|	|	|
4+10	0.0509	0.22	Q V	|	|	|	|
4+15	0.0524	0.22	Q V	|	|	|	|
4+20	0.0540	0.24	Q V	|	|	|	|
4+25	0.0558	0.25	|QV	|	|	|	|
4+30	0.0576	0.26	|Q V	|	|	|	|
4+35	0.0593	0.26	|Q V	|	|	|	|
4+40	0.0611	0.26	|Q V	|	|	|	|
4+45	0.0629	0.26	|Q V	|	|	|	|
4+50	0.0648	0.28	|Q V	|	|	|	|
4+55	0.0668	0.29	|Q V	|	|	|	|
5+ 0	0.0688	0.29	|Q V	|	|	|	|
5+ 5	0.0706	0.25	|Q V	|	|	|	|
5+10	0.0721	0.22	Q V	|	|	|	|
5+15	0.0736	0.22	Q V	|	|	|	|
5+20	0.0753	0.24	Q V	|	|	|	|
5+25	0.0770	0.25	|Q V	|	|	|	|
5+30	0.0788	0.26	|Q V	|	|	|	|
5+35	0.0807	0.28	|Q V	|	|	|	|
5+40	0.0827	0.29	|Q V	|	|	|	|
5+45	0.0848	0.29	|Q V	|	|	|	|
5+50	0.0868	0.29	|Q V	|	|	|	|
5+55	0.0888	0.29	|Q V	|	|	|	|
6+ 0	0.0908	0.29	|Q V	|	|	|	|
6+ 5	0.0930	0.31	|Q V	|	|	|	|
6+10	0.0953	0.33	|Q V	|	|	|	|
6+15	0.0975	0.33	|Q V	|	|	|	|
6+20	0.0998	0.33	|Q V	|	|	|	|
6+25	0.1021	0.33	|Q V	|	|	|	|
6+30	0.1044	0.33	|Q V	|	|	|	|
6+35	0.1068	0.35	|Q V	|	|	|	|
6+40	0.1093	0.37	|Q V	|	|	|	|
6+45	0.1118	0.37	|Q V	|	|	|	|
6+50	0.1144	0.37	|Q V	|	|	|	|
6+55	0.1169	0.37	|Q V	|	|	|	|

```
 7+ 0      0.1194      0.37  |Q    V   |         |         |         |
 7+ 5      0.1219      0.37  |Q    V   |         |         |         |
 7+10      0.1245      0.37  |Q    V   |         |         |         |
 7+15      0.1270      0.37  |Q    V   |         |         |         |
 7+20      0.1297      0.39  |Q    V   |         |         |         |
 7+25      0.1324      0.40  |Q    V   |         |         |         |
 7+30      0.1352      0.40  |Q     V  |         |         |         |
 7+35      0.1382      0.42  |Q     V  |         |         |         |
 7+40      0.1412      0.44  |Q     V  |         |         |         |
 7+45      0.1442      0.44  |Q     V  |         |         |         |
 7+50      0.1474      0.46  |Q     V  |         |         |         |
 7+55      0.1507      0.48  |Q     V  |         |         |         |
 8+ 0      0.1539      0.48  |Q      V |         |         |         |
 8+ 5      0.1575      0.52  | Q     V |         |         |         |
 8+10      0.1613      0.55  | Q     V |         |         |         |
 8+15      0.1651      0.55  | Q     V |         |         |         |
 8+20      0.1689      0.55  | Q     V |         |         |         |
 8+25      0.1727      0.55  | Q      V|         |         |         |
 8+30      0.1765      0.55  | Q      V|         |         |         |
 8+35      0.1804      0.57  | Q      V|         |         |         |
 8+40      0.1844      0.59  | Q      V|         |         |         |
 8+45      0.1885      0.59  | Q      V|         |         |         |
 8+50      0.1927      0.61  | Q       V         |         |         |
 8+55      0.1970      0.62  | Q       V         |         |         |
 9+ 0      0.2013      0.62  | Q       V         |         |         |
 9+ 5      0.2058      0.67  | Q       V         |         |         |
 9+10      0.2106      0.69  | Q       |V        |         |         |
 9+15      0.2154      0.70  | Q       |V        |         |         |
 9+20      0.2204      0.72  | Q       |V        |         |         |
 9+25      0.2254      0.73  | Q       |V        |         |         |
 9+30      0.2305      0.73  | Q       | V       |         |         |
 9+35      0.2357      0.76  |  Q      | V       |         |         |
 9+40      0.2410      0.77  |  Q      | V       |         |         |
 9+45      0.2463      0.77  |  Q      | V       |         |         |
 9+50      0.2517      0.79  |  Q      |  V      |         |         |
 9+55      0.2573      0.81  |  Q      |  V      |         |         |
10+ 0      0.2629      0.81  |  Q      |  V      |         |         |
10+ 5      0.2674      0.66  | Q       |  V      |         |         |
10+10      0.2713      0.57  | Q       |   V     |         |         |
10+15      0.2751      0.55  | Q       |   V     |         |         |
10+20      0.2789      0.55  | Q       |   V     |         |         |
10+25      0.2827      0.55  | Q       |   V     |         |         |
10+30      0.2865      0.55  | Q       |   V     |         |         |
10+35      0.2910      0.66  | Q       |    V    |         |         |
10+40      0.2960      0.72  | Q       |    V    |         |         |
10+45      0.3010      0.73  | Q       |    V    |         |         |
10+50      0.3061      0.73  | Q       |     V   |         |         |
10+55      0.3112      0.73  | Q       |     V   |         |         |
11+ 0      0.3162      0.73  | Q       |     V   |         |         |
11+ 5      0.3211      0.71  | Q       |     V   |         |         |
11+10      0.3260      0.70  | Q       |      V  |         |         |
11+15      0.3308      0.70  | Q       |      V  |         |         |
11+20      0.3356      0.70  | Q       |      V  |         |         |
11+25      0.3404      0.70  | Q       |      V  |         |         |
11+30      0.3452      0.70  | Q       |       V |         |         |
11+35      0.3497      0.66  | Q       |       V |         |         |
11+40      0.3540      0.63  | Q       |       V |         |         |
11+45      0.3583      0.62  | Q       |       V |         |         |
11+50      0.3628      0.65  | Q       |       V |         |         |
11+55      0.3673      0.66  | Q       |        V|         |         |
12+ 0      0.3719      0.66  | Q       |        V|         |         |
12+ 5      0.3774      0.81  |  Q      |        V|         |         |
12+10      0.3836      0.90  |  Q      |         V         |         |
12+15      0.3900      0.92  |  Q      |         V         |         |
12+20      0.3964      0.94  |  Q      |         V         |         |
12+25      0.4030      0.95  |  Q      |         |V        |         |
12+30      0.4096      0.95  |  Q      |         |V        |         |
12+35      0.4165      1.00  |   Q     |         |V        |         |
12+40      0.4236      1.03  |   Q     |         | V       |         |
12+45      0.4307      1.04  |   Q     |         | V       |         |
12+50      0.4381      1.07  |   Q     |         | V       |         |
```

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12+55      0.4455     1.08  |   Q     |         |  V      |         |
13+ 0      0.4530     1.09  |   Q     |         |  V      |         |
13+ 5      0.4614     1.22  |   Q     |         |   V     |         |
13+10      0.4704     1.31  |    Q    |         |   V     |         |
13+15      0.4795     1.32  |    Q    |         |    V    |         |
13+20      0.4886     1.32  |    Q    |         |    V    |         |
13+25      0.4977     1.32  |    Q    |         |     V   |         |
13+30      0.5068     1.32  |    Q    |         |     V   |         |
13+35      0.5141     1.05  |   Q     |         |     V   |         |
13+40      0.5201     0.87  |  Q      |         |      V  |         |
13+45      0.5259     0.84  |  Q      |         |      V  |         |
13+50      0.5317     0.84  |  Q      |         |      V  |         |
13+55      0.5375     0.84  |  Q      |         |       V |         |
14+ 0      0.5434     0.84  |  Q      |         |       V |         |
14+ 5      0.5498     0.94  |  Q      |         |       V |         |
14+10      0.5567     1.00  |   Q     |         |        V|         |
14+15      0.5637     1.01  |   Q     |         |        V|         |
14+20      0.5705     0.99  |  Q      |         |        V|         |
14+25      0.5772     0.97  |  Q      |         |         V         |
14+30      0.5839     0.97  |  Q      |         |         V         |
14+35      0.5906     0.97  |  Q      |         |         V         |
14+40      0.5973     0.97  |  Q      |         |         |V        |
14+45      0.6040     0.97  |  Q      |         |         |V        |
14+50      0.6106     0.95  |  Q      |         |         |V        |
14+55      0.6170     0.93  |  Q      |         |         | V       |
15+ 0      0.6234     0.93  |  Q      |         |         | V       |
15+ 5      0.6297     0.91  |  Q      |         |         | V       |
15+10      0.6358     0.89  |  Q      |         |         |  V      |
15+15      0.6419     0.89  |  Q      |         |         |  V      |
15+20      0.6479     0.86  |  Q      |         |         |  V      |
15+25      0.6537     0.85  |  Q      |         |         |   V     |
15+30      0.6596     0.85  |  Q      |         |         |   V     |
15+35      0.6648     0.76  |  Q      |         |         |   V     |
15+40      0.6697     0.71  | Q       |         |         |    V    |
15+45      0.6745     0.70  | Q       |         |         |    V    |
15+50      0.6793     0.70  | Q       |         |         |    V    |
15+55      0.6841     0.70  | Q       |         |         |    V    |
16+ 0      0.6889     0.70  | Q       |         |         |     V   |
16+ 5      0.6915     0.38  |Q        |         |         |     V   |
16+10      0.6928     0.18  Q         |         |         |     V   |
16+15      0.6938     0.15  Q         |         |         |     V   |
16+20      0.6948     0.15  Q         |         |         |     V   |
16+25      0.6958     0.15  Q         |         |         |     V   |
16+30      0.6968     0.15  Q         |         |         |     V   |
16+35      0.6977     0.13  Q         |         |         |     V   |
16+40      0.6985     0.11  Q         |         |         |     V   |
16+45      0.6992     0.11  Q         |         |         |     V   |
16+50      0.7000     0.11  Q         |         |         |     V   |
16+55      0.7007     0.11  Q         |         |         |     V   |
17+ 0      0.7015     0.11  Q         |         |         |     V   |
17+ 5      0.7025     0.15  Q         |         |         |     V   |
17+10      0.7038     0.18  Q         |         |         |     V   |
17+15      0.7050     0.18  Q         |         |         |     V   |
17+20      0.7063     0.18  Q         |         |         |     V   |
17+25      0.7076     0.18  Q         |         |         |      V  |
17+30      0.7088     0.18  Q         |         |         |      V  |
17+35      0.7101     0.18  Q         |         |         |      V  |
17+40      0.7114     0.18  Q         |         |         |      V  |
17+45      0.7126     0.18  Q         |         |         |      V  |
17+50      0.7138     0.16  Q         |         |         |      V  |
17+55      0.7148     0.15  Q         |         |         |      V  |
18+ 0      0.7158     0.15  Q         |         |         |      V  |
18+ 5      0.7168     0.15  Q         |         |         |      V  |
18+10      0.7178     0.15  Q         |         |         |      V  |
18+15      0.7188     0.15  Q         |         |         |      V  |
18+20      0.7198     0.15  Q         |         |         |      V  |
18+25      0.7208     0.15  Q         |         |         |      V  |
18+30      0.7219     0.15  Q         |         |         |      V  |
18+35      0.7227     0.13  Q         |         |         |      V  |
18+40      0.7235     0.11  Q         |         |         |      V  |
18+45      0.7243     0.11  Q         |         |         |      V  |
```

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   18+50       0.7249      0.09  Q          |          |          |       V  |
   18+55       0.7254      0.08  Q          |          |          |       V  |
   19+ 0       0.7259      0.07  Q          |          |          |        V |
   19+ 5       0.7266      0.09  Q          |          |          |        V |
   19+10       0.7273      0.11  Q          |          |          |        V |
   19+15       0.7281      0.11  Q          |          |          |        V |
   19+20       0.7290      0.13  Q          |          |          |        V |
   19+25       0.7300      0.14  Q          |          |          |        V |
   19+30       0.7310      0.15  Q          |          |          |        V |
   19+35       0.7318      0.13  Q          |          |          |        V |
   19+40       0.7326      0.11  Q          |          |          |        V |
   19+45       0.7334      0.11  Q          |          |          |        V |
   19+50       0.7340      0.09  Q          |          |          |        V |
   19+55       0.7345      0.08  Q          |          |          |        V |
   20+ 0       0.7350      0.07  Q          |          |          |        V |
   20+ 5       0.7357      0.09  Q          |          |          |        V |
   20+10       0.7364      0.11  Q          |          |          |        V |
   20+15       0.7372      0.11  Q          |          |          |        V |
   20+20       0.7379      0.11  Q          |          |          |        V |
   20+25       0.7387      0.11  Q          |          |          |        V |
   20+30       0.7394      0.11  Q          |          |          |        V |
   20+35       0.7402      0.11  Q          |          |          |        V |
   20+40       0.7410      0.11  Q          |          |          |        V |
   20+45       0.7417      0.11  Q          |          |          |        V |
   20+50       0.7423      0.09  Q          |          |          |        V |
   20+55       0.7428      0.08  Q          |          |          |        V |
   21+ 0       0.7434      0.07  Q          |          |          |        V |
   21+ 5       0.7440      0.09  Q          |          |          |        V |
   21+10       0.7447      0.11  Q          |          |          |        V |
   21+15       0.7455      0.11  Q          |          |          |         V|
   21+20       0.7461      0.09  Q          |          |          |         V|
   21+25       0.7466      0.08  Q          |          |          |         V|
   21+30       0.7471      0.07  Q          |          |          |         V|
   21+35       0.7478      0.09  Q          |          |          |         V|
   21+40       0.7485      0.11  Q          |          |          |         V|
   21+45       0.7493      0.11  Q          |          |          |         V|
   21+50       0.7499      0.09  Q          |          |          |         V|
   21+55       0.7504      0.08  Q          |          |          |         V|
   22+ 0       0.7509      0.07  Q          |          |          |         V|
   22+ 5       0.7516      0.09  Q          |          |          |         V|
   22+10       0.7523      0.11  Q          |          |          |         V|
   22+15       0.7531      0.11  Q          |          |          |         V|
   22+20       0.7537      0.09  Q          |          |          |         V|
   22+25       0.7542      0.08  Q          |          |          |         V|
   22+30       0.7547      0.07  Q          |          |          |         V|
   22+35       0.7552      0.07  Q          |          |          |         V|
   22+40       0.7557      0.07  Q          |          |          |         V|
   22+45       0.7563      0.07  Q          |          |          |         V|
   22+50       0.7568      0.07  Q          |          |          |         V|
   22+55       0.7573      0.07  Q          |          |          |         V|
   23+ 0       0.7578      0.07  Q          |          |          |         V|
   23+ 5       0.7583      0.07  Q          |          |          |         V|
   23+10       0.7588      0.07  Q          |          |          |         V|
   23+15       0.7593      0.07  Q          |          |          |         V|
   23+20       0.7598      0.07  Q          |          |          |         V|
   23+25       0.7603      0.07  Q          |          |          |         V|
   23+30       0.7608      0.07  Q          |          |          |         V|
   23+35       0.7613      0.07  Q          |          |          |         V|
   23+40       0.7618      0.07  Q          |          |          |         V|
   23+45       0.7623      0.07  Q          |          |          |         V|
   23+50       0.7628      0.07  Q          |          |          |         V|
   23+55       0.7633      0.07  Q          |          |          |         V|
   24+ 0       0.7638      0.07  Q          |          |          |         V|
   24+ 5       0.7641      0.03  Q          |          |          |         V|
   24+10       0.7641      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
```
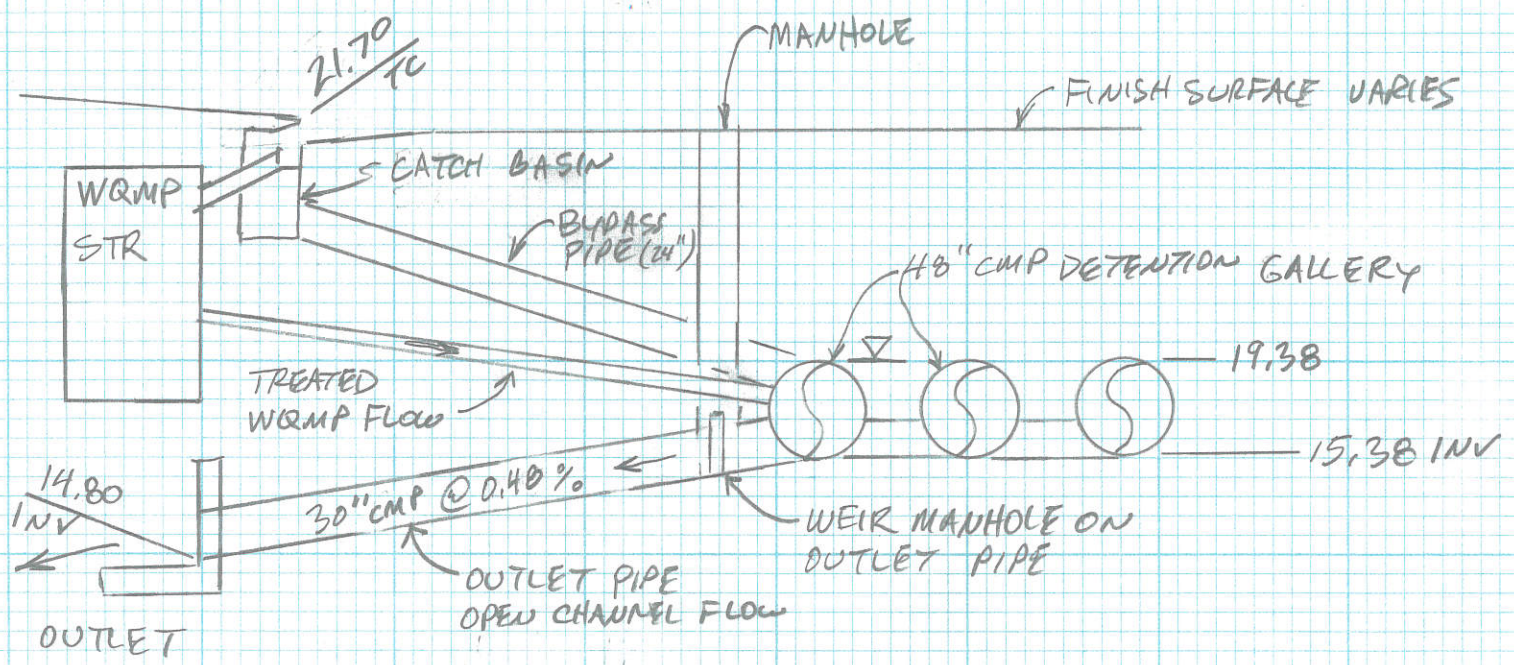
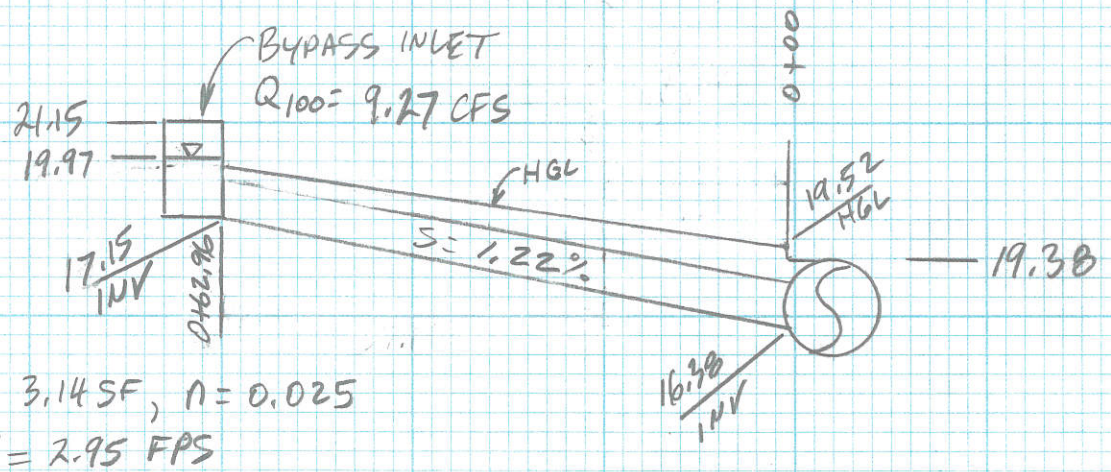

APPENDIX H

BASIN HYDRAULICS



24" BYPASS PIPE HYDRAULICS



24" A = 3.14 SF, n = 0.025

$V = \frac{9.27}{3.14} = 2.95$ FPS

FOR n = 0.013 $K_{24} = 226$

$\frac{V^2}{2g} = \frac{(2.95)^2}{64.4} = 0.14$

FOR n = .025 (CMP): $K = \frac{.013}{.025}(226) = 117.5$

$S_f = \left(\frac{Q}{K}\right)^2 = \left(\frac{9.27}{117.5}\right)^2 = 0.006$

ENTRANCE LOSS = $0.5\frac{V^2}{2g} = 0.5(.14) = 0.07'$

EXIT LOSS = $1.0\frac{V^2}{2g} = 0.14'$

HGL CALCULATIONS

AT 0+00 HGL = 19.38 + 0.14 = 19.52

AT 0+62.96 JUST OUTSIDE THE CATCH BASIN

HGL = 19.52 + (62.96)(.006) = 19.90 VS 19.15 SOFFIT

INSIDE BYPASS BOX HGL = 19.90 + 0.07 = 19.97 ±

BASIN STORAGE REQUIREMENTS

10 YEAR DEVELOPED VOLUME = 0.7641 AF

10 YEAR UNDEVELOPED VOLUME = 0.1536 AF

Δ = 0.6105 AF × 43560 = 26,594 CF STORAGE REQUIRED

USING 48" ϕ CMP PIPE A = 12.57 FT²/FT

USE 2116 CF

VOLUME PROVIDED = 2116 × 12.57 = 26598 CF > 26,594 CF O.K.

30" BASIN OUTLET PIPE OPEN CHANNEL FLOW

```
*************************************************************************
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*************************************************************************
*
          ***** NON-PRESSURE, OPEN CHANNEL CALCULATIONS ****

   CALCULATE DEPTH OF FLOW GIVEN:
   Channel Slope =    -.004800 (Ft./Ft.) =     -.4800 %
   Invert elevation at pipe INLET =         .480 (Ft.)
   Invert elevation at pipe OUTLET =         .000 (Ft.)
   Length of pipe =      100.000 (Ft.)
   Given Flow Rate =     9.27 Cubic Feet/Second



          *** PIPE OPEN CHANNEL FLOW ***


   Mannings "n" =  .025
   No. of pipes =   1   Velocity (Ft./Sec.) =     3.18
   Given Pipe Diameter(In.) =     30.00
   Individual pipe flow =    9.270     (CFS)
        "      "     "  =    4161.     (GPM)
        "      "     "  =    5.991     (MGD)
   Total pipe area =       706.86 (In2)
   Total perimeter of pipe =        94.25 (In.)
   Normal flow depth in pipe =     17.22 (In.)
   Flow top width inside pipe =     29.67 (In.)
   Area of flow =     419.7482 (In2)
   Wetted Perimeter =    51.58 (In.)
   Critical Depth in Pipe =      12.19 (In.)
   Total flow of pipe(s) =    9.270     (CFS)
     "     "   "    "    =    4161.     (GPM)
     "     "   "    "    =    5.991     (MGD)
```

24" BASIN BYPASS PIPE OPEN CHANNEL FLOW

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


*************************************************************************
*
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*************************************************************************
*
          ***** NON-PRESSURE, OPEN CHANNEL CALCULATIONS ****

   CALCULATE DEPTH OF FLOW GIVEN:
   Channel Slope =    -.012200 (Ft./Ft.) =    -1.2200 %
   Invert elevation at pipe INLET =        1.220 (Ft.)
   Invert elevation at pipe OUTLET =         .000 (Ft.)
   Length of pipe =      100.000 (Ft.)
   Given Flow Rate =     9.27 Cubic Feet/Second



          *** PIPE OPEN CHANNEL FLOW ***


   Mannings "n" =  .025
   No. of pipes =   1   Velocity (Ft./Sec.) =     4.49
   Given Pipe Diameter(In.) =     24.00
   Individual pipe flow =    9.270     (CFS)
        "      "     "  =    4161.     (GPM)
        "      "     "  =    5.991     (MGD)
   Total pipe area =       452.39 (In2)
   Total perimeter of pipe =        75.40 (In.)
   Normal flow depth in pipe =     14.98 (In.)
   Flow top width inside pipe =     23.25 (In.)
   Area of flow =     297.0743 (In2)
   Wetted Perimeter =    43.73 (In.)
   Critical Depth in Pipe =      13.05 (In.)
   Total flow of pipe(s) =    9.270     (CFS)
     "     "   "    "    =    4161.     (GPM)
     "     "   "    "    =    5.991     (MGD)
```

8" WQMP PIPE FROM BIO FILTER TO DETENTION STRUCTURE OPEN CHANNEL

```
*************************************************************************
                    ****** PIPE FLOW CALCULATIONS ******
                 Copyright (c) 1988, CivilDesign Software, Inc.

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


*************************************************************************
*
 For: For Licensed CivilDesign User

*************************************************************************
*
          ***** NON-PRESSURE, OPEN CHANNEL CALCULATIONS ****

   CALCULATE DEPTH OF FLOW GIVEN:
   Channel Slope =    -.015300 (Ft./Ft.) =    -1.5300 %
   Invert elevation at pipe INLET =        1.530 (Ft.)
   Invert elevation at pipe OUTLET =         .000 (Ft.)
   Length of pipe =      100.000 (Ft.)
   Given Flow Rate =      .70 Cubic Feet/Second



          *** PIPE OPEN CHANNEL FLOW ***


   Mannings "n" =  .013
   No. of pipes =   1   Velocity (Ft./Sec.) =     4.21
   Given Pipe Diameter(In.) =      8.00
   Individual pipe flow =    .7000     (CFS)
        "      "     "  =    314.2     (GPM)
        "      "     "  =    .4524     (MGD)
   Total pipe area =        50.27 (In2)
   Total perimeter of pipe =        25.13 (In.)
   Normal flow depth in pipe =      3.85 (In.)
   Flow top width inside pipe =      7.99 (In.)
   Area of flow =      23.9455 (In2)
   Wetted Perimeter =    12.27 (In.)
   Critical Depth in Pipe =       4.74 (In.)
   Total flow of pipe(s) =    .7000     (CFS)
     "     "   "    "    =    314.2     (GPM)
     "     "   "    "    =    .4524     (MGD)
```

APPENDIX I

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants

November 8, 2021 Project No. 192851-12A

Dr. Milan Chakrabarty
CHAKRABARTY, LLC
1003 East Florida Avenue, Suite 101
Hemet, CA 92543

Subject: **Infiltration Testing for Water Quality Treatment Areas, Proposed Commercial Development, Assessor Parcel Number 476-010-060, Located on the South West Corner of Winchester Road and Keller Road, City of Winchester, Riverside County, California**

INTRODUCTION

Earth Strata Geotechnical Services is pleased to present this infiltration feasibility report for the proposed commercial development, located on the southwest corner of Winchester Road and Keller Road, Assessor Parcel Number 476-010-060, in the City of Winchester, Riverside County, California. The purpose of our study was to determine the infiltration rates and physical characteristics of the subsurface earth materials at the approximate depth of the proposed WQMP area within the proposed development. This feasibility report provides the infiltration rates to be used for the design and the development of the water quality management plan, where applicable.

PROPERTY DESCRIPTION

The subject property is located on the southwest corner of Winchester Road and Keller Road in the City of Winchester, Riverside County, California. The approximate location of the site is shown on the Vicinity Map, Figure 1.

The subject property is comprised of approximately 5.25 acres of undeveloped land. The site has not been graded. Topographic relief at the subject property is relatively low with the terrain being generally flat. Elevations at the site range from approximately 1,413 to 1,428 feet above mean sea level (msl), for a difference of about 15± feet across the entire site. Drainage within the subject property generally flows to the northeast.

The site is currently bordered by a residential development to the west, Winchester Road to the south and east, and Keller Road to the north. Most of the vegetation on the site consists of light to moderate amounts of annual weeds/grasses throughout the subject site.

PROPOSED CONSTRUCTION

Based on the proposed development as illustrated on the conceptual grading plans will consist of a RV and Self-Storage development complete with interior streets, utilities, driveways, park, and an onsite water quality treatment basin.

SUBSURFACE EXPLORATION

Subsurface Exploration

Subsurface exploration within the subject site was performed on November 2, 2021, for the exploratory excavations. A truck mounted hollow-stem-auger drill rig was utilized to drill one (1) boring to a maximum depth of 20 feet. The exploratory holes were excavated for geotechnical evaluation purposes with respect to the proposed developments and to interpret whether groundwater or impermeable soil layers were present. An underground utilities clearance was obtained from Underground Service Alert of Southern California, prior to the subsurface exploration. The approximate locations of the exploratory excavations are shown on the attached Infiltration Location Map, Plate 1 and descriptive logs are presented in Appendix A.

Earth materials encountered during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions may have been reconciled to reflect laboratory test results with regard to ASTM D 2487.

Earth Materials

A general description of the earth materials observed on site is provided below.

Quaternary Alluvium (Qa): Quaternary Alluvium was encountered directly from the surface to a maximum depth of 5 feet. These materials were found to be light brown and in a dry, dense state.

Metasedimentary Rocks (ms): The bedrock deposits were encountered below the alluvium materials to the full depth of the excavation. This bedrock unit consists predominately of interbedded light to medium brown, fine to medium grained silty sand, fine to coarse grained sandstone, with occasional siltstone and claystone layers.

INFILTRATION TESTING

The double ring infiltrometer test method was utilized to perform a total of four (4) infiltration tests on November 3, 2021 to evaluate near surface infiltration rates in order to estimate the amount of storm water runoff that can infiltrate into the onsite water quality treatment plan areas. The infiltration tests were performed in general accordance with the requirements of double ring infiltration testing, ASTM D3385 and Appendix A of the Riverside County Flood Control and Water Conservation District.

The infiltration tests were performed using double ring infiltrometer and Mariotte tubes at a depth of 6 feet below existing grades. The locations of the infiltration tests are indicated on the attached infiltration Location Map, Plate 1. The double ring infiltrometer tests were located by property boundary measurement on the site plan and by using geographic features. Infiltration test data recorded in the field are summarized in the following table and is included within Appendix B including the graph of Infiltration Rate versus Elapsed Time.

Infiltration Test Summary

TEST NUMBER	INFILTRATION HOLE DEPTH (ft.)	INFILTRATION RATE (in/hr)	DESCRIPTION
DR-1	5	0.0	CLAY
DR-2	5	0.0	CLAY
DR-3	5	0.0	CLAY
DR-4	5	0.0	CLAY

The infiltration test rates were documented to be 0.0 inches per hour (in/hr). The observed hard compacted clay and bedrock material caused the infiltration testing to fail.

CONCLUSIONS AND RECOMMENDATIONS

General

From geotechnical and engineering geologic points of view, the proposed WQMP areas, where tested, is considered unsuitable for infiltration for the proposed development.

Groundwater

Groundwater was not observed during our subsurface exploration to a total depth of 20 feet.

Based on the data presented in this report and the recommendations set forth herein, it is the opinion of Earth Strata Geotechnical Services that a WQMP area cannot be utilized for infiltration at the subject site.

GRADING PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **Mr. Milan Chakrabarty** and their authorized representative. It likely does not contain sufficient information for other parties or other uses. Earth Strata should be engaged to review the final design plans and specifications prior to construction. This is to verify that the recommendations contained in this report have been properly incorporated into the project plans and specifications. Should Earth Strata not be accorded the opportunity to review the project plans and specifications, we are not responsibility for misinterpretation of our recommendations.
Earth Strata should be retained to provide observations during construction to validate this report. In order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

Earth Strata should review any changes in the project and modify and approve in writing the conclusions and recommendations of this report. This report and the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions encountered during grading or construction operations appear to be different than those indicated in this report, this office should be notified immediately, as revisions may be required.

REPORT LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Earth materials vary in type, strength, and other geotechnical properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the subject property. No practical study can completely eliminate uncertainty with regard to the anticipated geotechnical conditions in connection with a subject property.

The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by Earth Strata during construction. This report is considered valid for a period of one year from the time the report was issued.

This report was prepared with the understanding that it is the responsibility of the owner or their representative, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should properly implement the conclusions and recommendations during grading and construction, and notify the owner if they consider any of the recommendations presented herein to be unsafe or unsuitable.

Respectfully submitted,

EARTH STRATA GEOTECHNICAL SERVICES

Stephen M. Poole, PE 40219
President
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
STEPHEN MICHAEL POOLE
No. 692
GEOTECHNICAL
STATE OF CALIFORNIA

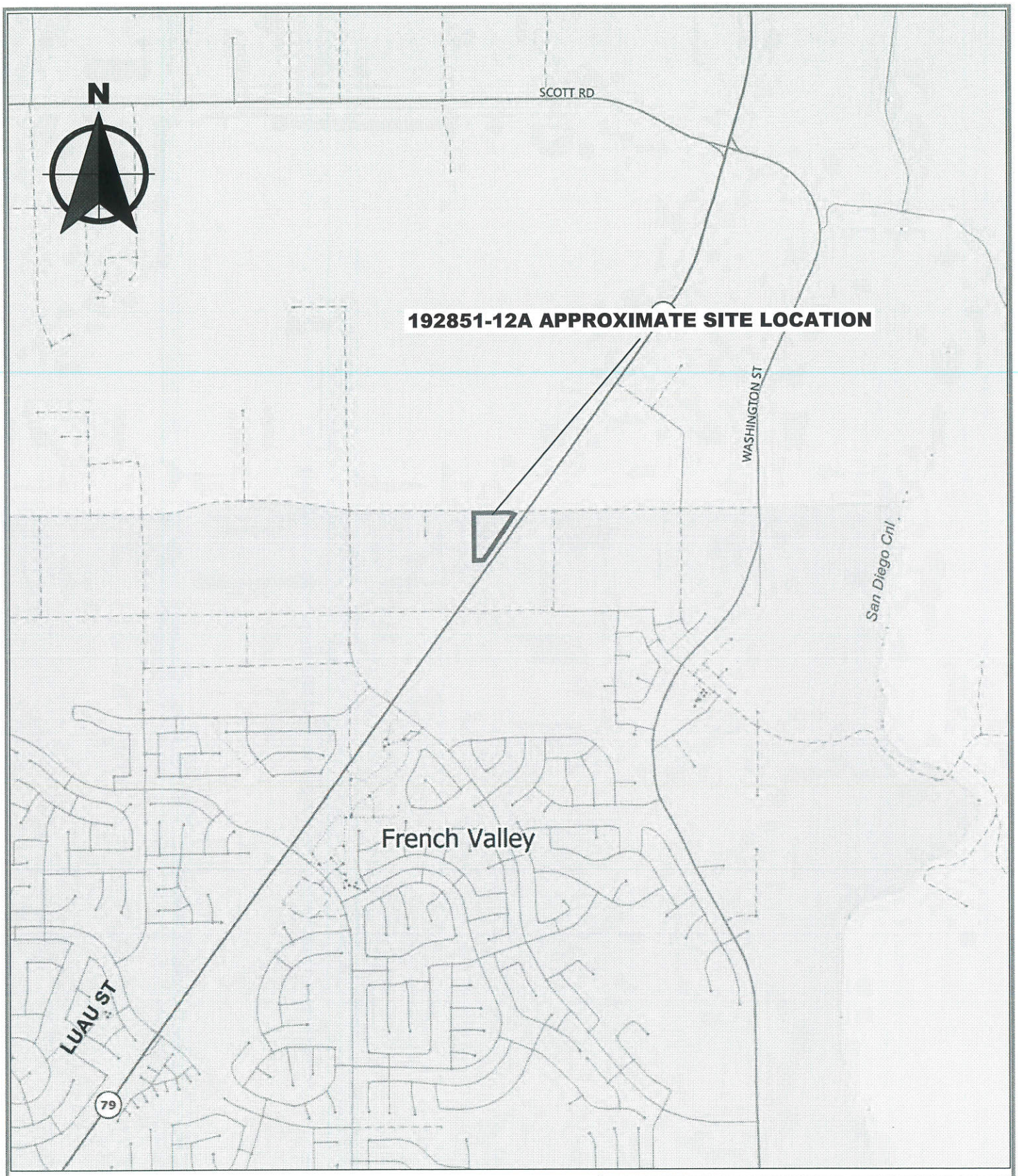
SMP/jmr

Distribution: (1) Addressee

Attachments: Figure 1 – Vicinity Map *(Rear of Text)*
Appendix A – Exploratory Logs *(Rear of Text)*
Appendix B – Infiltration Test Sheets *(Rear of Text)*
Plate 1 – Infiltration Location Map *(Rear of Text)*

FIGURE 1

VICINITY MAP



SCALE

0 1,000 2,000 3,000

Feet

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PROPOSED SINGLE FAMILY RESIDENCE		192851-12A
VICINITY MAP	SEE BAR SCALE	
	NOV 2021	FIGURE 1

APPENDIX A

EXPLORATORY LOGS

Geotechnical Log MW-1

Date: May 13, 2021	Project Name: Winchester and Keller - Winchester — Page: 1 of 1
Project Number: 192851-11A	Logged By: JMR
Drilling Company: Drilling IT	Type of Rig: B-61
Drive Weight (lbs): -	Drop (in): - Hole Diameter (in): -
Top of Hole Elevation (ft): See Map	Hole Location: See Geotechnical Map

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa):**
					SM	Silty SAND; light brown, dry, dense, fine to carse sand with gravel
						Metasedimentary Rocks (ms):
					CL	yellowish brown, dry, hard, fine to coarse grained, breaks down to clay
5						
						very hard
10						
15						
20						Total Depth: 20 feet
25						
30						

42184 Remington Avenue, Temecula, CA 92590

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APPENDIX B

INFILTRATION TEST SHEETS

Test No.	DR-1	Location	See Map

Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants
www.ESGSINC.com (951) 397-4313

Project Identification:	192851-12A					Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-1					Inner Ring	729	10.0	1		10000
Liquid Used:	TAP WATE	pH:	8.0			Annular Ring	2189	10.0	2		10000
Tested By:	JMR/GG		Date	11/3/2021		Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	400		Depth of Test	6'		Penetration Depth of Outer Ring:	9 cm		Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Flow Readings: Inner Maroitte Tube Flow (ml)	Flow Readings: Annular Space Reading cm	Flow Readings: Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Infiltration Rates: Inner Infiltration Rate In/h	Infiltration Rates: Annular Infiltration Rate cm/h	Infiltration Rates: Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Ground Temperature: Temp at Depth (c)	Remarks: Weather conditions Etc...
1	Start Test	11/3/2021	8:30	0:25	25												
	End Test	11/3/2021	8:55	0:25			925		1400		3.05	**1.20**	1.53	**0.60**			
2	Start Test	11/3/2021	8:56	0:30	55												
	End Test	11/3/2021	9:26	0:55			475		575		1.30	**0.51**	0.53	**0.21**			
3	Start Test	11/3/2021	9:27	0:30	85												
	End Test	11/3/2021	9:57	1:25			0		0		0.00	**0.00**	0.00	**0.00**			
4	Start Test	11/3/2021	10:00	0:30	115												
	End Test	11/3/2021	10:30	1:55			0		0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Project Identification:	192851-12A		
Test Location:	DR-1		
Liquid Used:	TAP WAT	pH:	8.0
Tested By:	JMR/GG		
Depth to water table:			400

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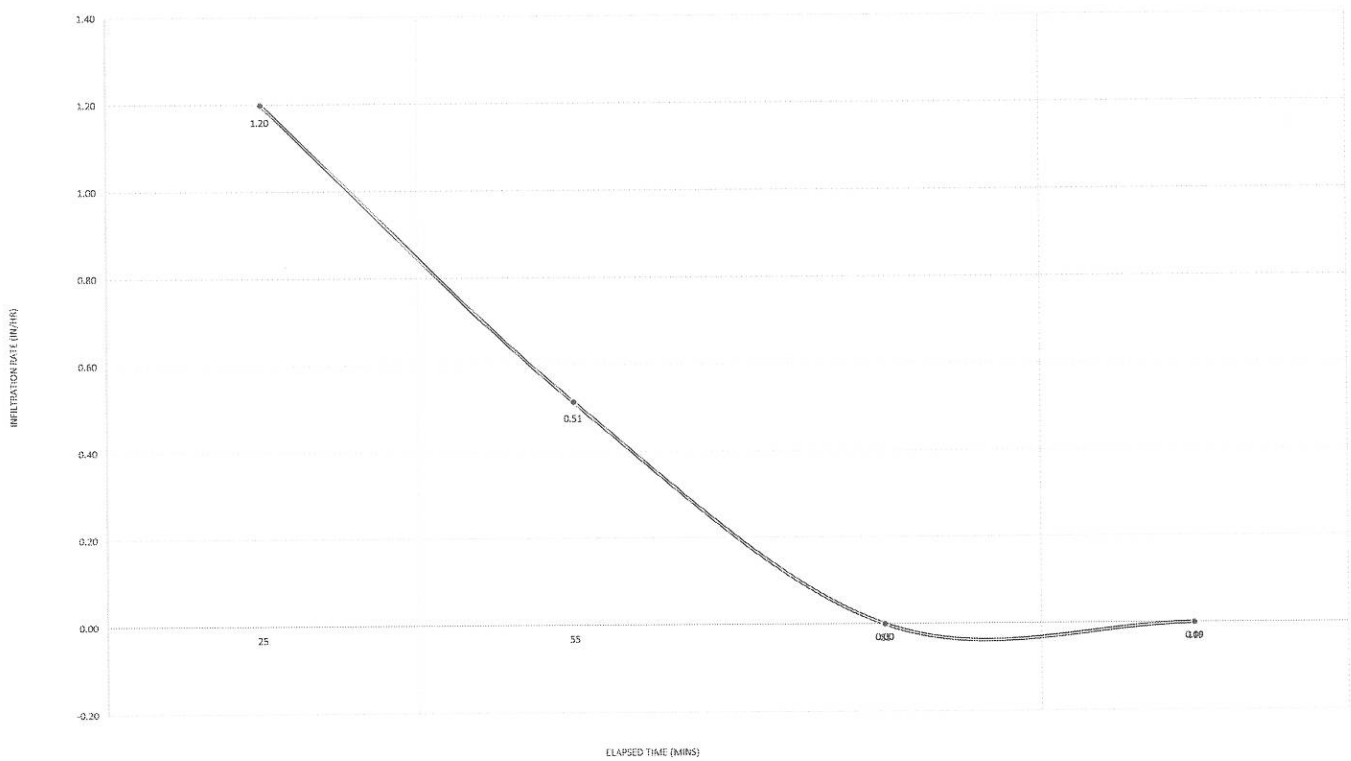
ELAPSED TIME VS. INFILTRATION RATE



Test No.	DR-2	Location	See Map

Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants
www.ESGSINC.com (951) 397-4313

Project Identification:	192851-12A				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-2				Inner Ring	729	10.0	1		10000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	JMR/GG		Date	11/3/2021		Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	400		Depth of Test	6'		Penetration Depth of Outer Ring:		9 cm	Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Flow Readings: Inner Maroitte Tube Flow (ml)	Flow Readings: Annular Space Reading cm	Flow Readings: Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Infiltration Rates: Inner Infiltration Rate in/h	Infiltration Rates: Annular Infiltration Rate cm/h	Infiltration Rates: Annular Infiltration Rate in/h	Ground Temperature: Ground Temp Depth (cm)	Ground Temperature: Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	11/3/2021	8:32	0:25	25												
1	End Test	11/3/2021	8:57	0:25			1750		1400		5.76	**2.27**	1.53	**0.60**			
	Start Test	11/3/2021	8:58	0:30	55												
2	End Test	11/3/2021	9:28	0:55			450		575		1.23	**0.49**	0.53	**0.21**			
	Start Test	11/3/2021	9:29	0:30	85												
3	End Test	11/3/2021	9:59	1:25			0		0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/3/2021	10:01	0:30	115												
4	End Test	11/3/2021	10:31	1:55			0		0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Project Identification:	192851-12A		
Test Location:	DR-2		
Liquid Used:	TAP WAT	pH:	8.0
Tested By:	JMR/GG		
Depth to water table:			400

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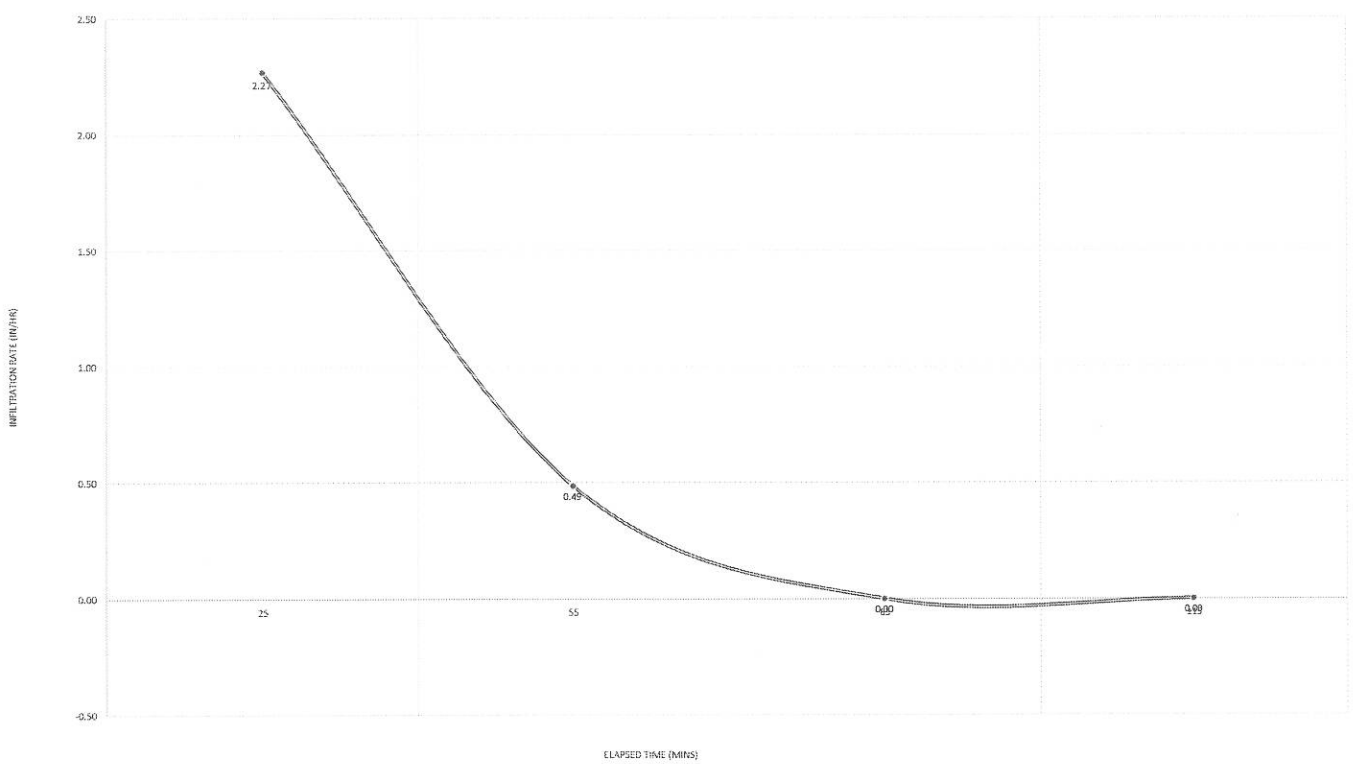
ELAPSED TIME VS. INFILTRATION RATE



Test No.	DR-3	Location	See Map

Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants
www.ESGSINC.com (951) 397-4315

Project Identification:	192851-12A				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-3				Inner Ring	729	10.0	1		10000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	JMR/GG	Date	11/3/2021		Liquid level maintained	(X) Flow Valve ( ) Float Valve ( ) Mariotte Tubes					
Depth to water table:	400	Depth of Test	6'		Penetration Depth of Outer Ring:	9 cm				Other	

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Flow Readings: Inner Maroitte Tube Flow (ml)	Flow Readings: Annular Space Reading cm	Flow Readings: Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Infiltration Rates: Inner Infiltration Rate In/h	Infiltration Rates: Annular Infiltration Rate cm/h	Infiltration Rates: Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Ground Temperature: Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	11/3/2021	11:00	0:25	25												
1	End Test	11/3/2021	11:25	0:25			750		1250		2.47	**0.97**	1.37	**0.54**			
	Start Test	11/3/2021	11:26	0:30	55												
2	End Test	11/3/2021	11:56	0:55			450		950		1.23	**0.49**	0.87	**0.34**			
	Start Test	11/3/2021	11:57	0:30	85												
3	End Test	11/3/2021	12:27	1:25			0		600		0.00	**0.00**	0.55	**0.22**			
	Start Test	11/3/2021	12:28	0:30	115												
4	End Test	11/3/2021	12:58	1:55			0		0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/3/2021	12:59	0:30	145												
5	End Test	11/3/2021	13:29	2:25			0		0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Project Identification:	192851-12A		
Test Location:	DR-3		
Liquid Used:	TAP WAT	pH:	8.0
Tested By:	JMR/GG		
Depth to water table:	400		

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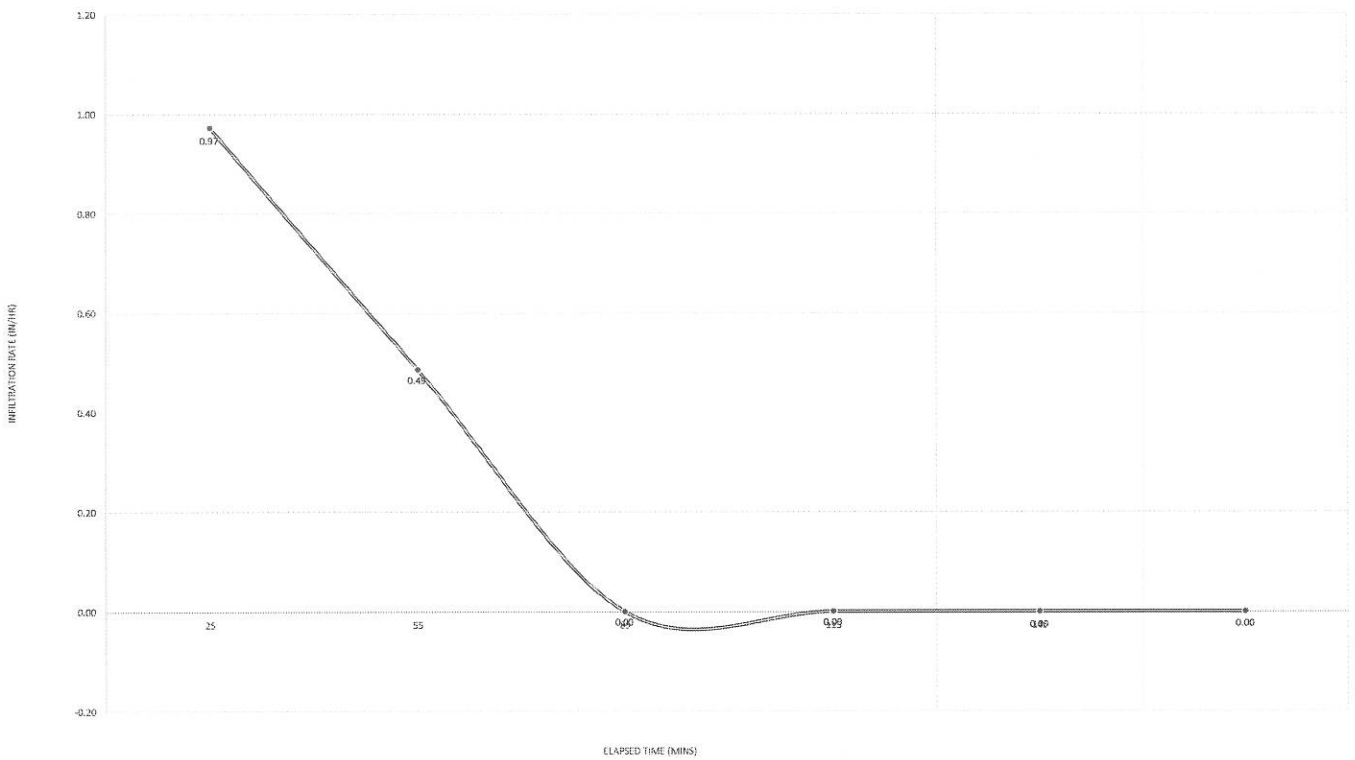
ELAPSED TIME VS. INFILTRATION RATE



Test No.	DR-4	Location	See Map

Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants
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Project Identification:	192851-12A					Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-4					Inner Ring	729	10.0	1		10000
Liquid Used:	TAP WATE	pH:	8.0			Annular Ring	2189	10.0	2		10000
Tested By:	JMR/GG		Date	11/3/2021		Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	400		Depth of Test	6'		Penetration Depth of Outer Ring:		9 cm	Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Flow Readings: Inner Maroitte Tube Flow (ml)	Flow Readings: Annular Space Reading cm	Flow Readings: Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Infiltration Rates: Inner Infiltration Rate in/h	Infiltration Rates: Annular Infiltration Rate cm/h	Infiltration Rates: Annular Infiltration Rate in/h	Ground Temperature: Ground Temp Depth (cm)	Ground Temperature: Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	11/3/2021	11:02	0:25	25												
1	End Test	11/3/2021	11:27	0:25			700		1400		2.30	0.91	1.53	0.60			
	Start Test	11/3/2021	11:28	0:30	55												
2	End Test	11/3/2021	11:58	0:55			450		600		1.23	0.49	0.55	0.22			
	Start Test	11/3/2021	11:59	0:30	85												
3	End Test	11/3/2021	12:29	1:25			350		0		0.96	0.38	0.00	0.00			
	Start Test	11/3/2021	12:30	0:30	115												
4	End Test	11/3/2021	13:00	1:55			0		0		0.00	0.00	0.00	0.00			
	Start Test	11/3/2021	13:01	0:30	145												
5	End Test	11/3/2021	13:31	2:25			0		0		0.00	0.00	0.00	0.00			

Turf-Tec International

Project Identification:	192851-12A		
Test Location:	DR-4		
Liquid Used:	TAP WAT	pH:	8.0
Tested By:	JMR/GG		
Depth to water table:	400		

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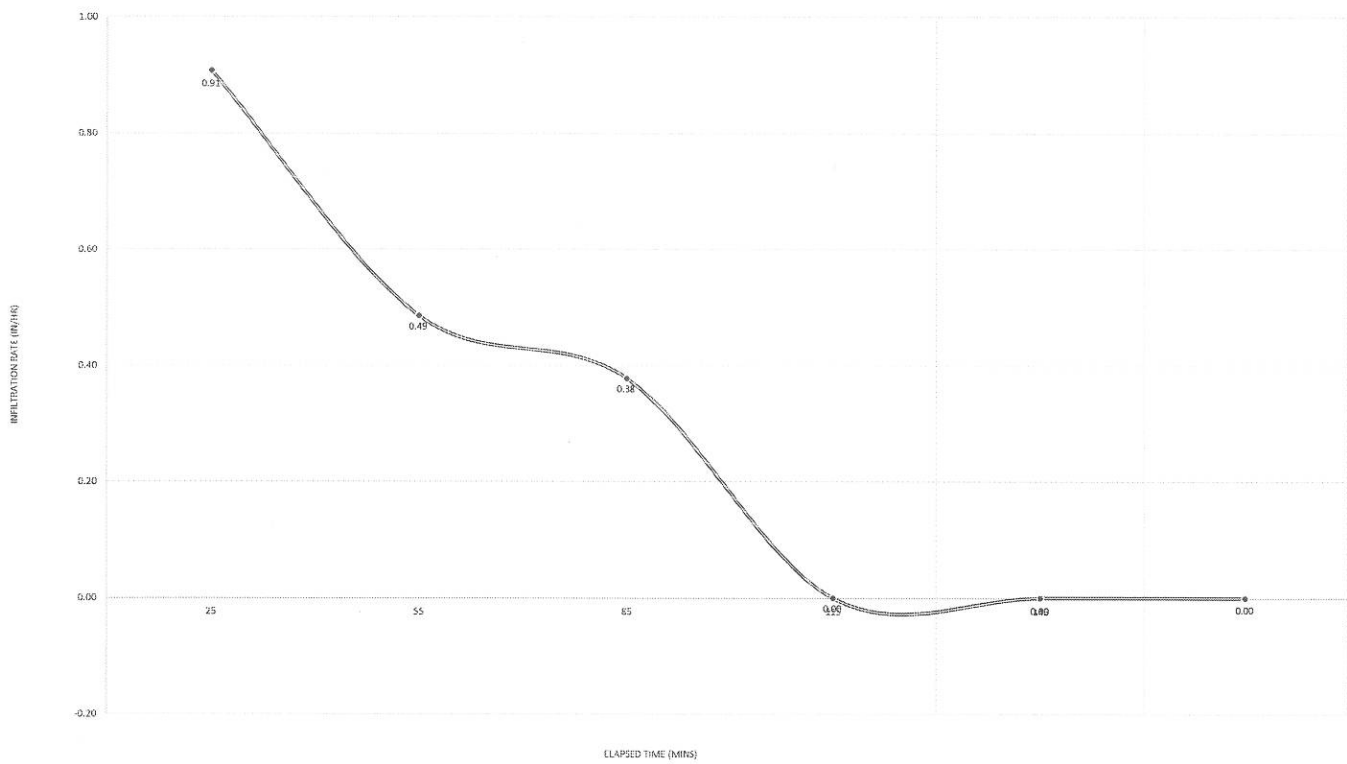
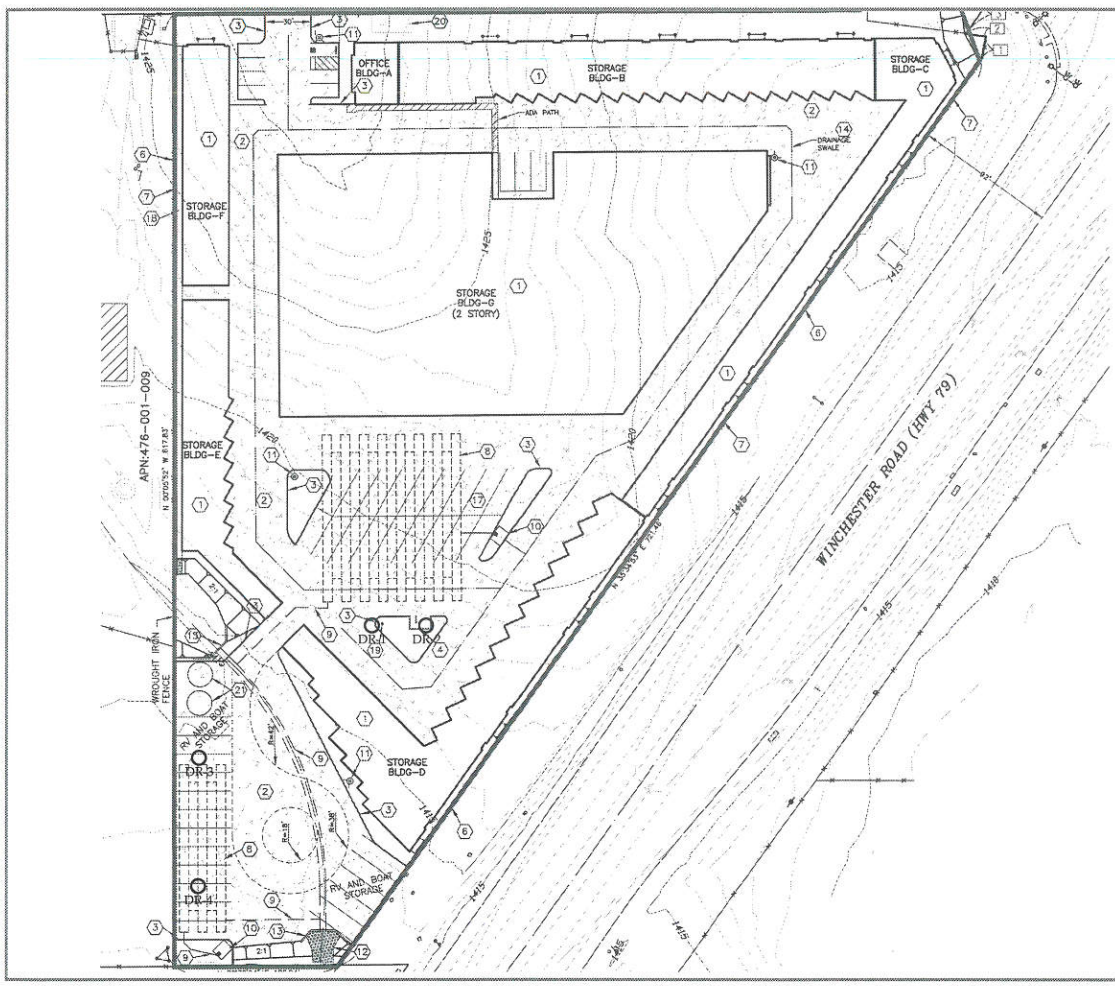
ELAPSED TIME VS. INFILTRATION RATE





LEGEND

Locations are Approximate

Symbols

- Limits of Report

DR-4 - Double Ring Test Location

0 30 60 120

SCALE: 1" = 60'

INFILTRATION LOCATION MAP

LOCATED ON THE SOUTHWEST CORNER OF WINCHESTER ROAD AND KELLER ROAD, CITY OF WINCHESTER, RIVERSIDE COUNTY, CALIFORNIA

APN 476-010-060

PROJECT	PROPOSED SINGLE FAMILY RESIDENCE		
CLIENT	DR. MILAN CHAKRABARTY		
PROJECT NO.	192851-12A		
DATE	NOVEMBER 2021		
SCALE	1" = 60'		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	1 OF 1

Earth Strata Geotechnical Services, Inc.
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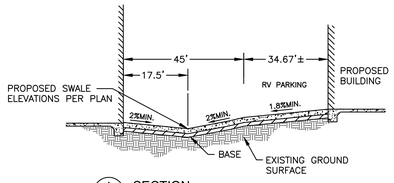
APPENDIX J

TEMECULA VALLEY SELF STORAGE PRELIMINARY GRADING PLAN



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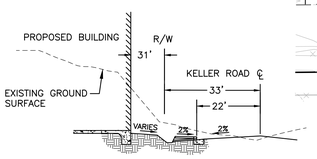

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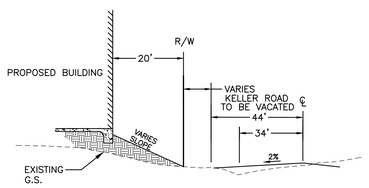

C WALL SECTION
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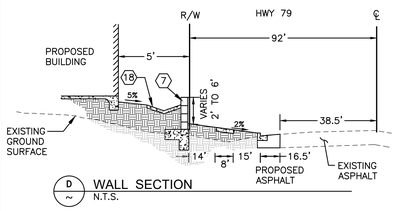

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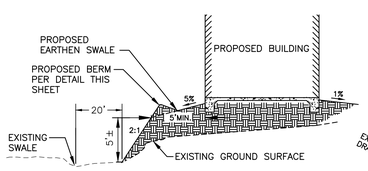

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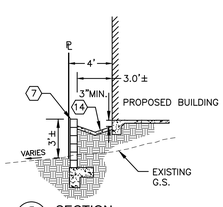

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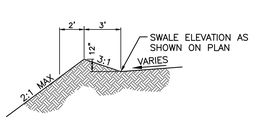

BERM DETAIL
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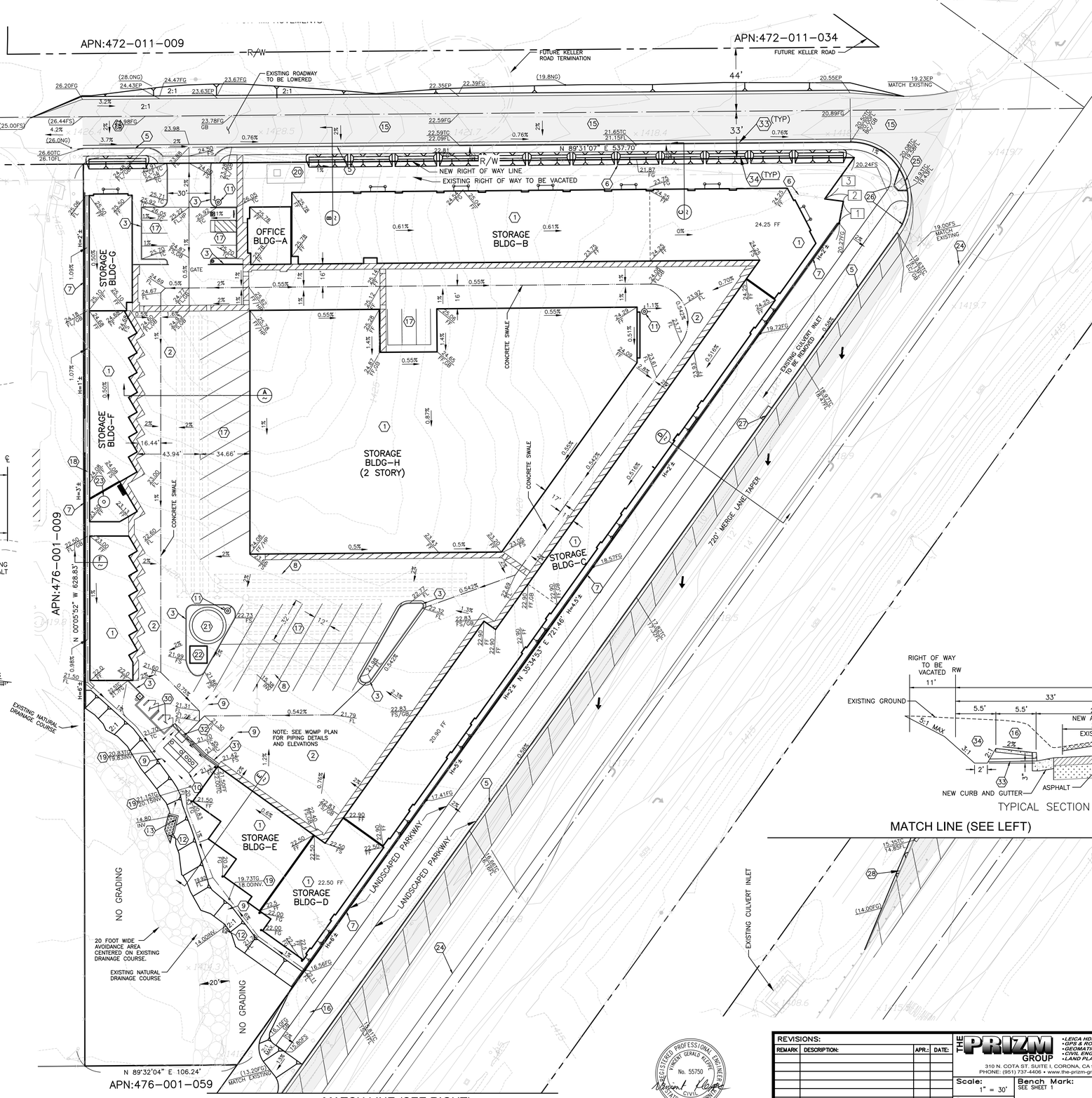
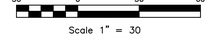
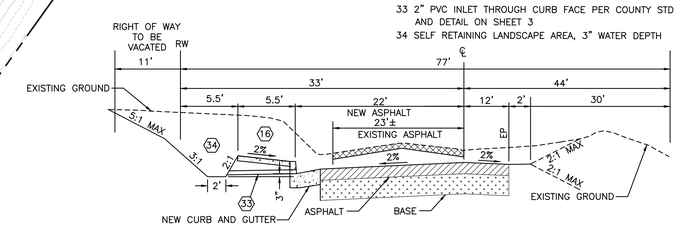




Scale 1" = 30

CONSTRUCTION NOTES:

1 PROPOSED STORAGE STRUCTURE
2 PROPOSED CONCRETE SURFACE
3 PROPOSED 6" PLANTER CURB
4 PROPOSED TRASH ENCLOSURE
5 PROPOSED 6" CURB AND GUTTER
6 EXISTING FENCE TO BE REMOVED
7 PROPOSED BLOCK RETAINING WALL
8 PROPOSED UNDERGROUND STORAGE DETENTION CHAMBERS (26,594 CF) PER DETAIL ON SHEET 4
9 PROPOSED STORM DRAIN
10 PROPOSED WATER QUALITY MANAGEMENT BIO FILTRATION CHAMBER PER DETAIL ON SHEET 3
11 PROPOSED FIRE HYDRANT
12 PROPOSED RIP RAP PAD
13 PROPOSED HEAD WALL
14 PROPOSED CONCRETE SWALE
15 NEW ASPHALT SURFACE
16 PROPOSED SIDEWALK
17 PROPOSED PARKING STALLS
18 PROPOSED CONCRETE "V" DITCH
19 CATCH BASIN
20 PROPOSED SEPTIC TANK
21 PROPOSED FIRE STORAGE TANKS
22 PROPOSED PUMP HOUSE
23 WATER WELL
24 PROPOSED RAISED MEDIAN
25 PROPOSED HANDICAP RAMP
26 RELOCATE TRAFFIC SIGNALS AS REQUIRED
27 PROPOSED CATCH BASIN
28 PROPOSED AC BERM TAPER
29 PROTECT IN PLACE
30 TRASH ENCLOSURE
31 PROSED CURB AND GUTTER
32 PROPOSED CATCH BASIN PER RCFC & WCD STD 100 , W=7', WITH DIVERSION TROUGH PER DETAIL ON SHEET 3
33 2" PVC INLET THROUGH CURB FACE PER COUNTY STD 310, AND DETAIL ON SHEET 3
34 SELF RETAINING LANDSCAPE AREA, 3" WATER DEPTH



TYPICAL SECTION KELLER ROAD (N.T.S.)

LINE TABLE:

NUMBER	DIRECTION	DISTANCE
1	N 11°01'15" E	15.48'
2	N 82°42'48" W	13.12'
3	N 35°34'53" E	35.46'

EARTHWORK

12,590 CY CUT, 10,152 CY FILL
(DOES NOT INCLUDE DETENTION STRUCURE EXCAVATION)

REGISTERED PROFESSIONAL ENGINEER VINCENT GERARD REDDY No. 55750 CIVIL STATE OF CALIFORNIA

REVISIONS:			
REMARK	DESCRIPTION:	APR.:	DATE:
DESIGNED: VGK	DRAWN: BM	CHECKED: VGK	

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310 N. COTA ST. SUITE I, CORONA, CA 92880
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• GEOMATIC ENGINEERING
• CIVIL ENGINEERING
• LAND PLANNING

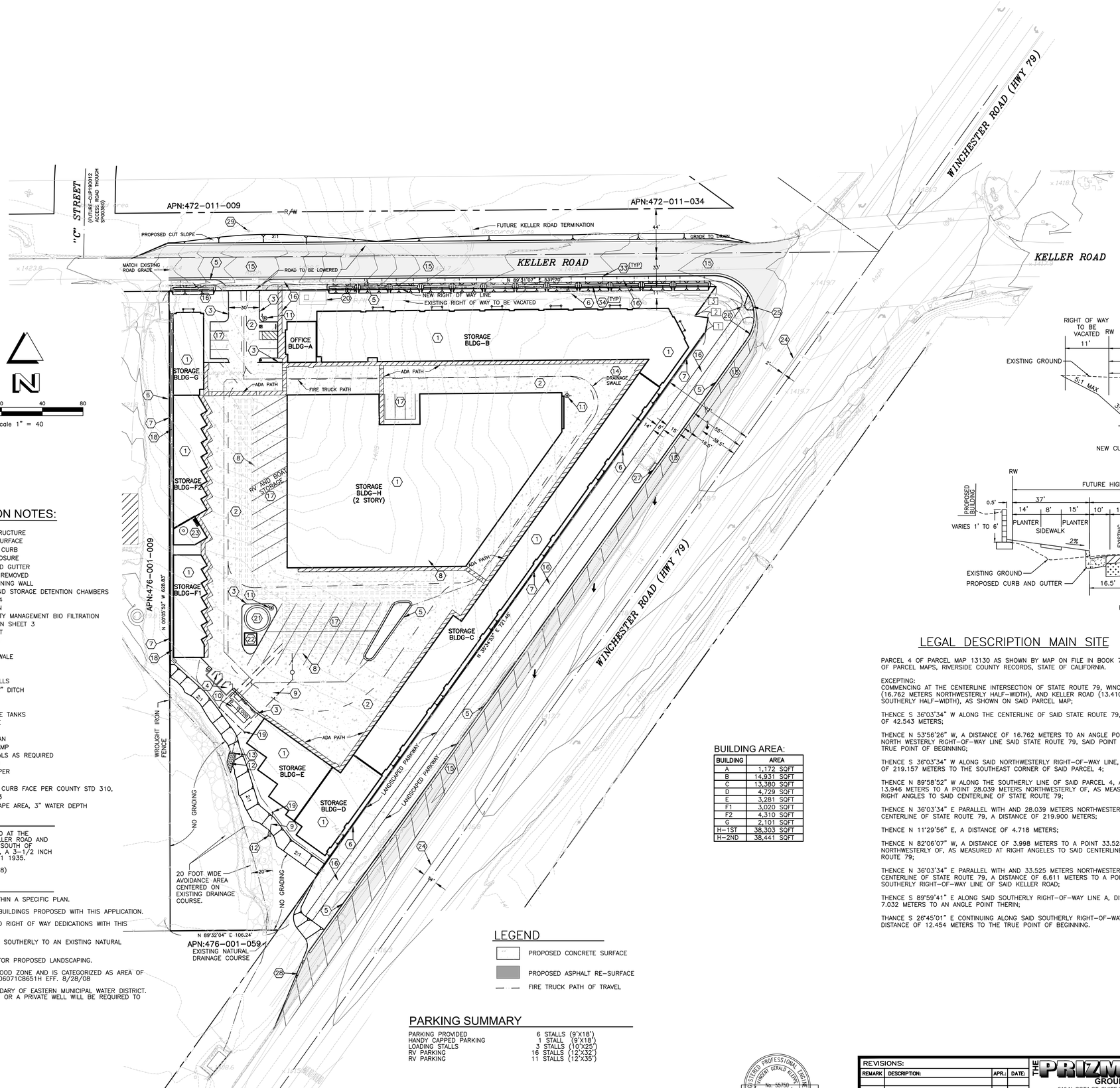
Scale: 1" = 30'
Bench Mark: SEE SHEET 1
Date: 4-6-22

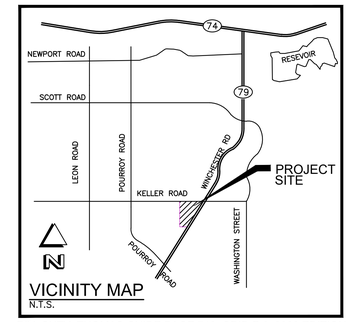
TEMECULA VALLEY SELF STORAGE PRELIMINARY GRADING PLAN

Sheet No. 2 OF 4 SHEETS
FILE NO. 19-004

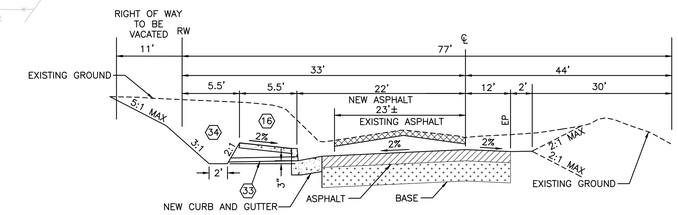
File name: P:\TPG\19\19-004\GP\19-004PGP02.dwg

TEMECULA VALLEY SELF STORAGE C.U.P. 190012 EXHIBIT

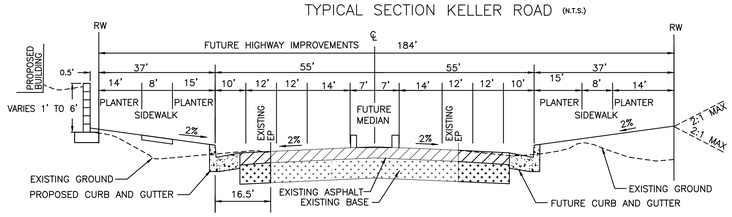




RIV. CNTY. THOMAS GUIDE PAGE 712, GRID F-6, 2000 EDITION



TYPICAL SECTION KELLER ROAD (N.T.S.)



TYPICAL SECTION
WINCHESTER ROAD (HWY79)
N.T.S. (RIVERSIDE CO. STD. No.83)

CONSTRUCTION NOTES:

1 PROPOSED STORAGE STRUCTURE
2 PROPOSED CONCRETE SURFACE
3 PROPOSED 6" PLANTER CURB
4 PROPOSED TRASH ENCLOSURE
5 PROPOSED 6" CURB AND GUTTER
6 EXISTING FENCE TO BE REMOVED
7 PROPOSED BLOCK RETAINING WALL
8 PROPOSED UNDERGROUND STORAGE DETENTION CHAMBERS PER DETAIL ON SHEET 4
9 PROPOSED STORM DRAIN
10 PROPOSED WATER QUALITY MANAGEMENT BIO FILTRATION CHAMBER PER DETAIL ON SHEET 3
11 PROPOSED FIRE HYDRANT
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14 PROPOSED CONCRETE SWALE
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25 PROPOSED HANDICAP RAMP
26 RELOCATE TRAFFIC SIGNALS AS REQUIRED
27 PROPOSED CATCH BASIN
28 PROPOSED AC BERM TAPER
29 PROTECT IN PLACE
33 2" PVC INLET THROUGH CURB FACE PER COUNTY STD 310, AND DETAIL ON SHEET 3
34 SELF RETAINING LANDSCAPE AREA, 3" WATER DEPTH

BENCHMARK

NGS CONTROL POINT DX1680 AT THE NORTHWEST CORNER OF KELLER ROAD AND WASHINGTON STREET, 8.8FT SOUTH OF POWER POLE No. 2075860E, A 3–1/2 INCH BRASS DISK, STAMPED X 311 1935.

ELEVATION: 1433.58' (NAVD88)

NOTES

1. THIS PROJECT IS NOT WITHIN A SPECIFIC PLAN.
2. THERE ARE 8 NEW NEW BUILDINGS PROPOSED WITH THIS APPLICATION.
3. THERE ARE NO PROPOSED RIGHT OF WAY DEDICATIONS WITH THIS APPLICATION.
4. ALL STORM WATER FLOWS SOUTHERLY TO AN EXISTING NATURAL DRAINAGE PATH.
5. SEE LANDSCAPING PLAN FOR PROPOSED LANDSCAPING.
6. THE SITE IS IN THE X FLOOD ZONE AND IS CATEGORIZED AS AREA OF MINIMAL FLOOD HAZARD. 06071C8651H EFF. 8/28/08
7. SITE IS WITHIN THE BOUNDARY OF EASTERN MUNICIPAL WATER DISTRICT. A WATER MAIN EXTENSION OR A PRIVATE WELL WILL BE REQUIRED TO SERVE THE SITE.

BUILDING AREA:

BUILDING	AREA
A	1,172 SQFT
B	14,931 SQFT
C	13,380 SQFT
D	4,729 SQFT
E	3,281 SQFT
F1	3,020 SQFT
F2	4,310 SQFT
G	2,101 SQFT
H–1ST	38,303 SQFT
H–2ND	38,441 SQFT

LEGEND

PROPOSED CONCRETE SURFACE
PROPOSED ASPHALT RE–SURFACE
FIRE TRUCK PATH OF TRAVEL

PARKING SUMMARY

PARKING PROVIDED	6 STALLS (9'X18')
HANDY CAPPED PARKING	1 STALL (9'X18')
LOADING STALLS	3 STALLS (10'X25')
RV PARKING	16 STALLS (12'X32')
RV PARKING	11 STALLS (12'X35')

EASEMENTS

NONE

PERMIT AREA

THE PROPOSED PERMIT AREA COVERS APPROXIMATELY 4.6 ACRES.

LEGAL DESCRIPTION MAIN SITE

PARCEL 4 OF PARCEL MAP 13130 AS SHOWN BY MAP ON FILE IN BOOK 70, PAGE 53 OF PARCEL MAPS, RIVERSIDE COUNTY RECORDS, STATE OF CALIFORNIA.

EXCEPTING:
COMMENCING AT THE CENTERLINE INTERSECTION OF STATE ROUTE 79, WINCHESTER ROAD (16.762 METERS NORTHWESTERLY HALF–WIDTH), AND KELLER ROAD (13.410 METERS SOUTHERLY HALF–WIDTH), AS SHOWN ON SAID PARCEL MAP;

THENCE S 36°03'34" W ALONG THE CENTERLINE OF SAID STATE ROUTE 79, A DISTANCE OF 42.543 METERS;

THENCE N 53°56'26" W, A DISTANCE OF 16.762 METERS TO AN ANGLE POINT IN THE NORTH WESTERLY RIGHT–OF–WAY LINE SAID STATE ROUTE 79, SAID POINT BEING THE TRUE POINT OF BEGINNING;

THENCE S 36°03'34" W ALONG SAID NORTHWESTERLY RIGHT–OF–WAY LINE, A DISTANCE OF 219.157 METERS TO THE SOUTHEAST CORNER OF SAID PARCEL 4;

THENCE N 89°58'52" W ALONG THE SOUTHERLY LINE OF SAID PARCEL 4, A DISTANCE OF 13.946 METERS TO A POINT 28.039 METERS NORTHWESTERLY OF, AS MEASURED AT RIGHT ANGLES TO SAID CENTERLINE OF STATE ROUTE 79;

THENCE N 36°03'34" E PARALLEL WITH AND 28.039 METERS NORTHWESTERLY OF SAID CENTERLINE OF STATE ROUTE 79, A DISTANCE OF 219.900 METERS;

THENCE N 11°29'56" E, A DISTANCE OF 4.718 METERS;

THENCE N 82°06'07" W, A DISTANCE OF 3.998 METERS TO A POINT 33.525 METERS NORTHWESTERLY OF, AS MEASURED AT RIGHT ANGELES TO SAID CENTERLINE OF STATE ROUTE 79;

THENCE N 36°03'34" E PARALLEL WITH AND 33.525 METERS NORTHWESTERLY OF SAID CENTERLINE OF STATE ROUTE 79, A DISTANCE OF 6.611 METERS TO A POINT ON THE SOUTHERLY RIGHT–OF–WAY LINE OF SAID KELLER ROAD;

THENCE S 89°59'41" E ALONG SAID SOUTHERLY RIGHT–OF–WAY LINE A, DISTANCE OF 7.032 METERS TO AN ANGLE POINT THERIN;

THANCE S 26°45'01" E CONTINUING ALONG SAID SOUTHERLY RIGHT–OF–WAY LINE, A DISTANCE OF 12.454 METERS TO THE TRUE POINT OF BEGINNING.

GENERAL NOTES

APPLICANT:
CHAKRABARTY LLC.
ATTN: DR. MILAN S. CHAKRABARTY
1003 E. FLORIDA AVE. SUITE 101
HEMET, CA 92543
(951) 652–2252

PREPARED BY:
THE PRIZM GROUP
310 N. COTA ST., SUITE I
CORONA, CA 92880
(951) 737–4406

PROPOSED IMPROVEMENTS:
8 NEW BUILDINGS

PLANT AND TREE PROTECTION:
NOT APPLICABLE

SOURCE OF CONTOURS:
AERIAL TOPOGRAPHIC MAPPING BY INLAND AERIAL SURVEYS.

EXISTING LAND USE:
VACANT

EXISTING ZONING:
C–1/C–P ZONE, GENERAL COMMERCIAL

PROPOSED ZONING:
C–1/C–P ZONE, GENERAL COMMERCIAL.

PROPOSED PROJECT:
STORAGE FACILITY

FEMA FLOOD PLAIN:
ZONE X

WASTE DISPOSAL:
WASTE MANAGEMENT

NUMBER OF UNITS:
1

ASSESSORS PARCEL No.:
476–010–060

SITE ADDRESS
VACANT LAND
WHINCHESTER, CA 92596

UTILITIES:

WATER/SEWER:
E.M.W.D.
CARMEN VALENZUELA
PO BOX 8300
PERRIS, CA 92572

PHONE:
FRONTIER COMMUNICATIONS
BID KEANS
295 N. SUNRISE LN.
PALM SPRINGS, CA 92262

SCHOOL DISTRICT:
TEMECULA VALLEY UNIFIED SCHOOL DISTRICT

ELECTRIC:
S.C. EDISON
1351 E. FRANCIS ST.
ONTARIO, CA 91761
(909) 503–5565

GAS:
S.C. GAS
GEARY AMBERNS
1981 W. LUGONIA AVE.
REDLENDS, CA 92374
(909) 335–7955

CABLE T.V.:
CHARTER
GOZETTE MILES
1500 AUTO CENTER DR.
ONTARIO, CA 91761
(909)975–3398

REGISTERED PROFESSIONAL ENGINEER VINCENT GERALD KLOPP No. 55750 CIVIL STATE OF CALIFORNIA

REVISIONS:			
REMARK	DESCRIPTION:	APR.:	DATE:
DESIGNED: VGK	DRAWN: LO	CHECKED: VGK	

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PHONE: (951) 737-4406 • tpg@the-prizm-group.com

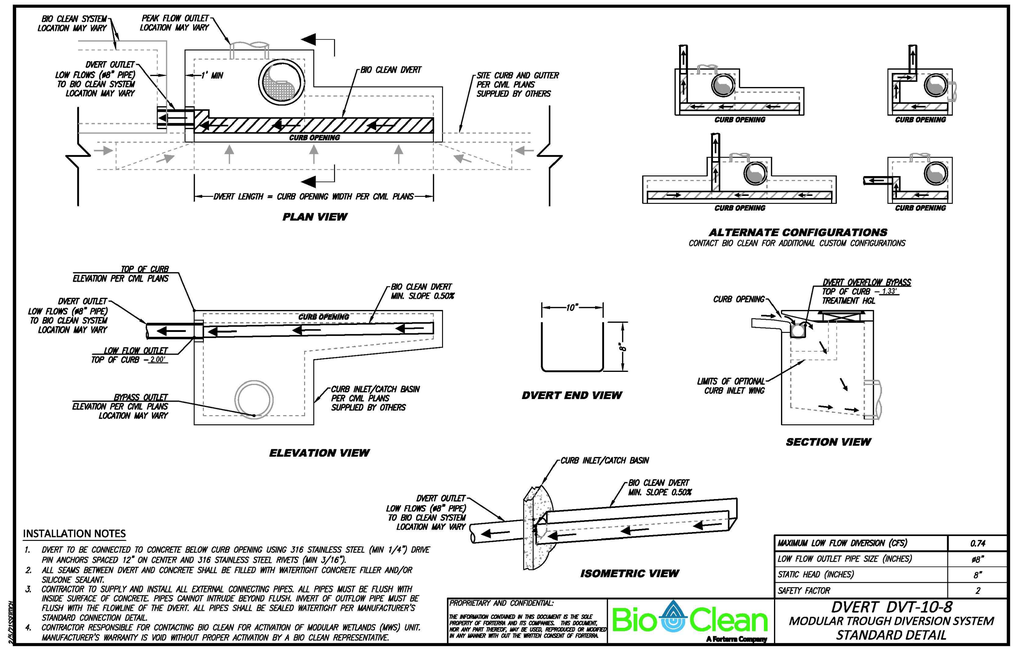
Scale: 1" = 40'
Date: 4–6–22
Bench Mark: SEE THIS SHEET

TEMECULA VALLEY SELF STORAGE C.U.P. EXHIBIT TITLE SHEET

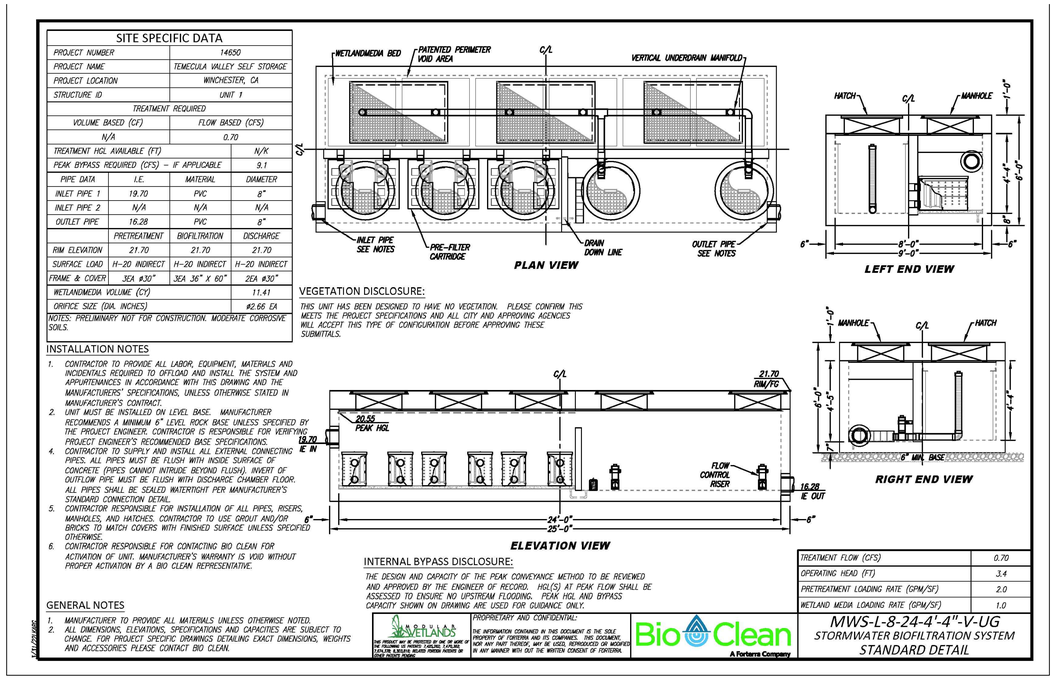
Sheet No. 1 OF 4 SHEETS
FILE NO. 19–004

File name: P:\TPG\19\19–004\CUP\19–004 CUP01.dwg

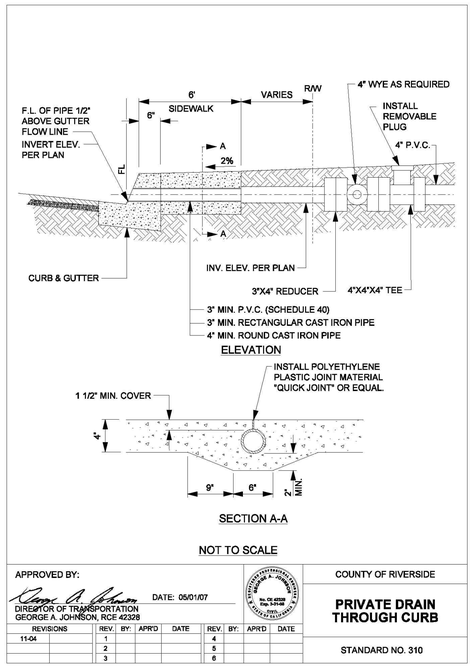
TEMECULA VALLEY SELF STORAGE DETAILS



32 DIVERSION TROUGH DETAIL
N.T.S.



10 WQMP BIOFILTRATION CHAMBER
N.T.S.



33 CURB INLET DETAIL
N.T.S.

REGISTERED PROFESSIONAL ENGINEER VINCENT GERALD KLOVE No. 55750 CIVIL STATE OF CALIFORNIA

REVISIONS:			
REMARK	DESCRIPTION:	APR.:	DATE:

DESIGNED: VGK DRAWN: BM CHECKED: VGK

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• LAND PLANNING

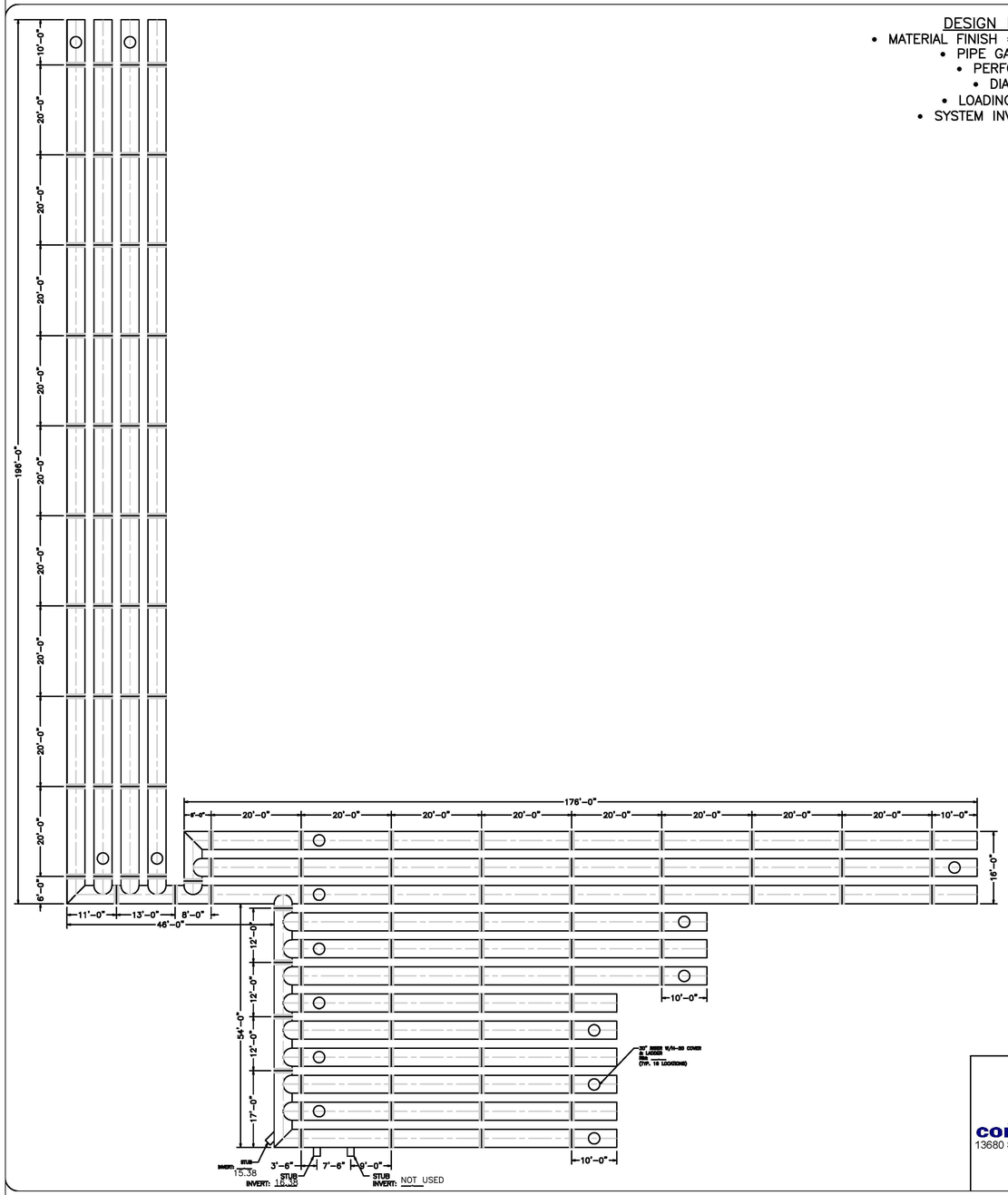
Scale: NONE
Bench Mark: SEE THIS SHEET
Date: 4-6-22

TEMECULA VALLEY SELF STORAGE DETAILS

Sheet No. 3 OF 4 SHEETS
FILE NO. 19-004

File name: P:\TPG\19\19-004\GP\19-004PGP03.dwg

TEMECULA VALLEY SELF STORAGE DETAILS



DESIGN INFORMATION
- MATERIAL FINISH = GALVANIZED
- PIPE GAUGE = 16GA.
- PERFORATED = NO
- DIAMETER = 48"
- LOADING = H20/H25
- SYSTEM INVERT = 15.38

HEAVY CONSTRUCTION

For temporary construction vehicle loads (100 kips/axle load), put at least four feet of compacted cover on top of the pipe (but not exceeding the maximum allowable cover over the pipe).

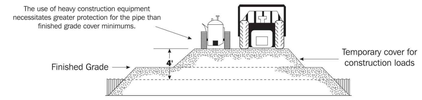


Table 7.8

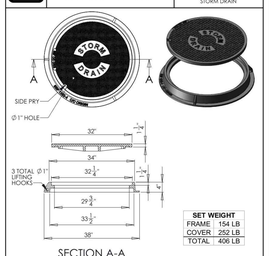
General guidelines for minimum cover required for heavy off-road construction equipment

Pipe Span, in.	Minimum Cover (ft) for Indicted Axle Loads (kips)*			
	18-50	50-75	75- 110	110- 150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

* Minimum cover may vary, depending on local conditions. The contractor must provide the additional cover required to avoid damage to the pipe. Minimum cover is measured from the top of the pipe to the top of the maintained construction roadway surface.

South Bay Foundry
WWW.SOUTHBAYFOUNDRY.COM
PHONE (619) 956-2780 FAX (619) 956-2788

SBF 1252-4
30" MANHOLE FRAME AND COVER STORM DRAIN



SET WEIGHT	
FRAME	154 LB
COVER	252 LB
TOTAL	406 LB

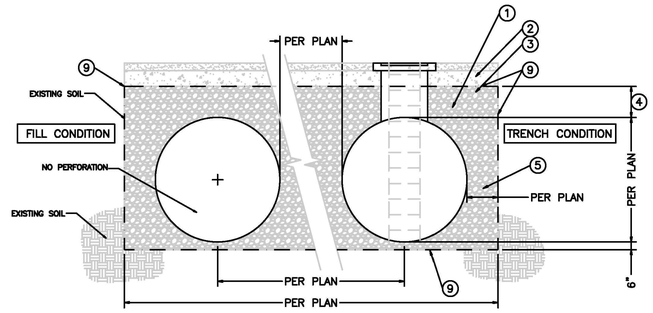
GENERAL INFORMATION
*MATERIALS CONFORM TO ASTM A48 CLASS 35B
*BEARING SURFACES MACHINED FOR CLOSE, QUIET FIT
*COVER WILL SEAT IN ANY POSITION ON FRAME PLANE
*FRAME AND COVER MEETS H-20 WHEEL LOADING

APPROVED
BY:
TITLE:
AGENCY:
DATE:

NOTES:
1. TOP 12" OF COVER IS TO BE 1" GRAVEL
2. SOIL MEDIA
3. NORMAL ROADWAY EMBANKMENT FILL PLACED IN 8" LIFTS AND COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T-99.
4. 12" MIN. FOR DIAMETERS THROUGH 96", 18" MIN. FOR DIAMETERS FROM 102" AND UP. MEASURE FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF PIPE TO TOP OF RIGID PAVEMENT.
5. FREE DRAINING ANGULAR WASHED STONE 3/4" – 2" AROUND PIPE ENVELOPE AS SHOWN OR OTHERWISE NOTED.
6. CSP GAGE PER AASHTO SECTION12.
7. NOT USED
8. LISTED SPACING CHART IS FOR MULTIPLE PIPE INSTALLATION. FOR SINGLE RUN, THE TRENCH REQUIRES ONLY THE BOTTOM WIDTH OF THE PIPE'S SPAN, PLUS ROOM FOR COMPACTION EQUIPMENT.

SPACING CHART PER AISI AND NCSPA GUIDELINES	
DIAMETER	REQUIRED SPACING
UP TO 24"	12"
24" – 72"	1/2 PIPE DIA.
72" AND UP	36"

9. 4 oz. NON WOVEN GEOTEXTILE FABRIC TERRATEX NO4E (OR EQUAL).
10. RELATIVELY LOOSE GRANULAR BEDDING ROUGHLY SHAPED TO FIT BOTTOM OF PIPE, 4" TO 6" IN DEPTH. (#57 OR #8 OR OTHER SUITABLE GRANULAR).



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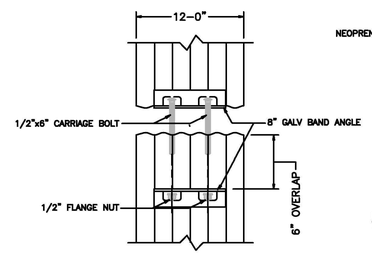
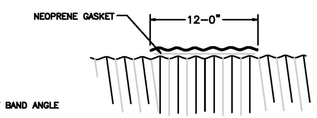
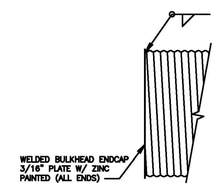


ANNULAR BAND DETAIL
N.T.S.



STANDARD SECTION
N.T.S.



B–B
TYPICAL BULKHEAD

GENERAL NOTES:
1. BANDS ARE FURNISHED AS FOLLOWS:
   12" THRU 48" – 1-PIECE
   54" THRU 96" – 2 PIECE
   102" THRU 144" – 3 PIECE
2. GALV BAND ANGLES ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDED.
3. DIMMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
4. DIMPLE BANDS FOR ARCHED PIPE ARE THE SAME AS FOR EQUIVALENT ROUND PIPE DIAMETER.

PACIFIC CORRUGATED PIPE CO.
13680 SLOVER AVENUE FONTANA, CA 92337
800.338.5858 * 909.829.4235
Fx: 909.829.8035
SOCAL@PCPIPE.COM

NOTE:
THE SUITABILITY OF THE INFORMATION PRESENTED FOR USE ON ANY PARTICULAR PROJECT SHOULD BE DETERMINED BY THE ENGINEER RESPONSIBLE FOR THE DESIGN.

PROJECT NAME: TEMECULA VALLEY SELF STORAGE
PROJECT #:
SIGN & DATE TO RELEASE FOR MANUFACTURE (SUBJECT TO PRICE VERIFICATION)
DATE SIGNATURE
PLANS APPROVED
☐ (AS NOTED) ☐ (W/CHANGES)

REV.	DESCRIPTION	DATE
1		

DRAWN BY: J. BROWN
SCALE: AS NOTED
DATE: 03.31.22
SHEET NO: 1 OF 1

8 UNDERGROUND DETENTION CHAMBER
N.T.S.

REGISTERED PROFESSIONAL ENGINEER VINCENT GERALD PLOEG No. 55750 STATE OF CALIFORNIA

REVISIONS:

REMARK	DESCRIPTION:	APR.:	DATE:

DESIGNED: VGK DRAWN: BM CHECKED: VGK

THE PRIZM GROUP
310 N. COTA ST. SUITE I, CORONA, CA 92880
PHONE: (951) 737-4406 • www.the-prizm-group.com
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• LAND PLANNING

Scale: NONE
Bench Mark: SEE SHEET 1
Date: 4-6-22

TEMECULA VALLEY SELF STORAGE DETAILS

Sheet No. 4 OF 4 SHEETS
FILE NO. 19-004

File name: P:\TPG\19\19-004\GP\19-004PGP04.dwg