Appendix H-1 - Preliminary Drainage Report

ALLARD ENGINEERING
civil engineering land surveying land planning

I Kuan Tao
Temple

APN No. 266-320-025

Preliminary Drainage Report

December 7, 2020

Prepared For:
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(714) 0624-8659

Prepared By:
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Prepared under the supervision of:

_____

Raymond J Allard, P.E. RCE 36052 Exp. 06-30-22

Discussion

Introduction

The proposed project (30.8 acres) consists of a 7.5 ac temple facility named I Kuan Tao. The proposed temple development includes worship and supporting facilities, parking areas and a retention basin being Phase I. A future phase of 8.5 ac residential sub-division will be processed and constructed later. The remaining parcel is a natural conservation area of 14.8 ac that will remain undisturbed. The project's proposed retention basin has been sized to store and infiltrate the temple's improvements and the future residential development for the 100-yr 24-hr storm volume. The project parcel (APN 266-320-025) is located in the unincorporated City of Riverside, County of Riverside. The site is east of Cole Avenue, North of Markham Street and south of Landin Lane.

Purpose

The purpose of this report is to demonstrate how the developed runoff for the proposed temple/future residential development mitigated and retained into a proposed retention basin for a 100-yr, 24-hr storm event. The retention basin overflow is the gutter in Cole Avenue.

Criteria

The criteria utilized for hydrologic and Hydraulic analysis is the Riverside County Hydrology Manual and CivilDesign software were utilized to perform computations. 100-yr storm analysis was performed.

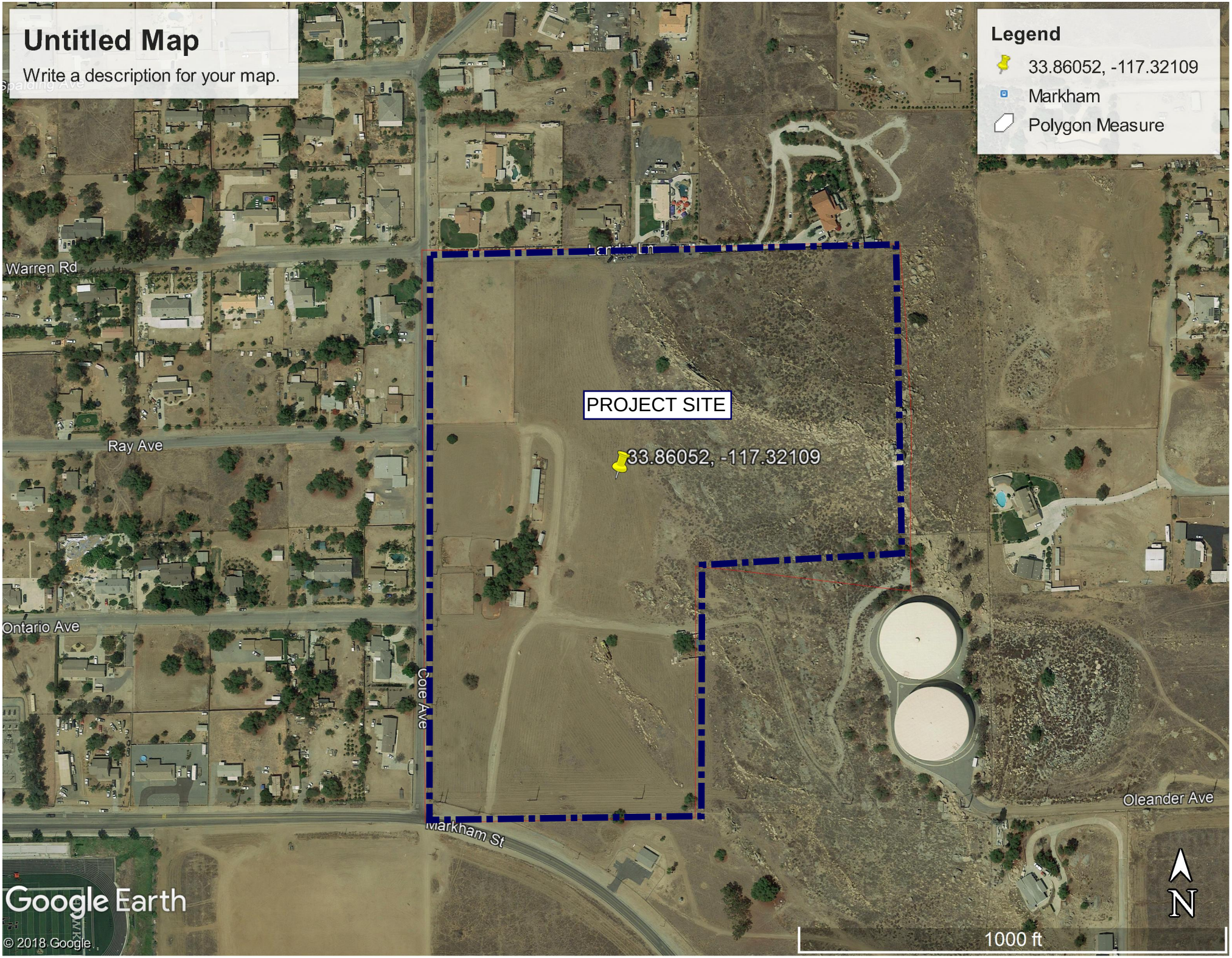
Findings

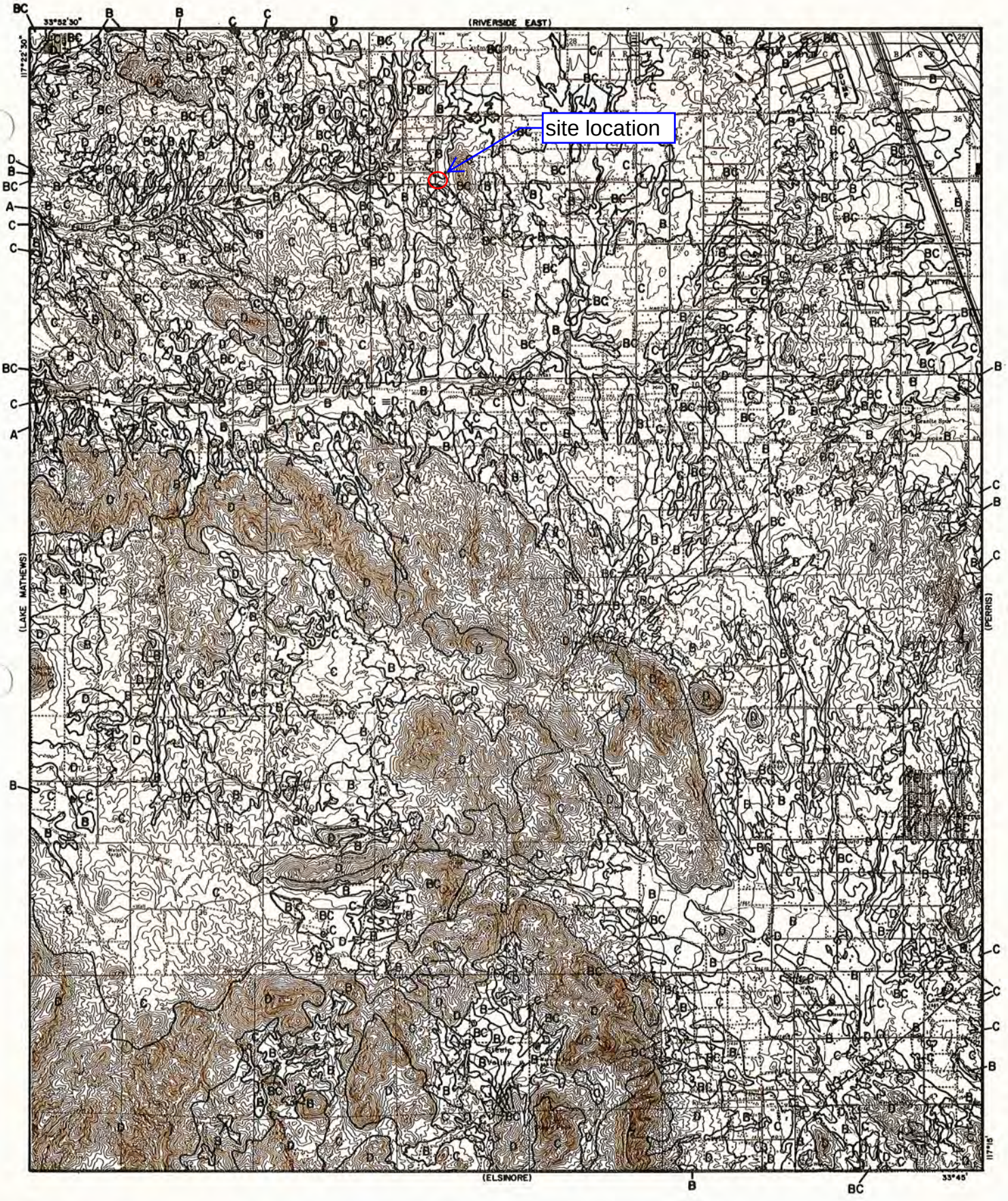
Due the preliminary nature of this report, only the 100-yr storm event for the developed hydrology for has been analyzed.

The onsite 100-yr, 24 hr storm developed hydrology shows a peak runoff volume of 2.27 ac-ft from proposed temple site and 1.61 ac-ft from future residential development. This water will be conveyed into the proposed retention/infiltration basin for full retention. The retention basin was sized to handle a total of 3.96 ac-ft which exceeds the combined retention volume of 3.88 ac-ft from Phase I & II for the 100-yr storm event.

Also, we analyzed offsite areas tributary to Phase I development and Phase-II future development. A peak flow of 22.8 cfs (100-yr storm event) generated from offsite area (12.3 ac) tributary to phase-I will drain through phase-I proposed developed area and will be picked up by the proposed gutter and conveys to the retention basin via storm drain system onsite. When the basin reaches the capacity, it will drain to the street gutter (in Cole Ave) which is consistent with the existing drainage pattern. The offsite area of 7.1 ac tributary to phase-II future development will generate a peak flow 12.9 cfs (100-yr storm event) and will drains through phase-II area and finally discharge to the street gutter in Cole Ave. which is also consistence with the existing drainage pattern.

Reference Materials


Untitled Map
Write a description for your map.
Legend
33.86052, -117.32109
Markham
Polygon Measure
Warren Rd
Ray Ave
Ontario Ave
Cole Ave
Markham St
Oleander Ave
PROJECT SITE
33.86052, -117.32109
Google Earth
© 2018 Google
N
1000 ft



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

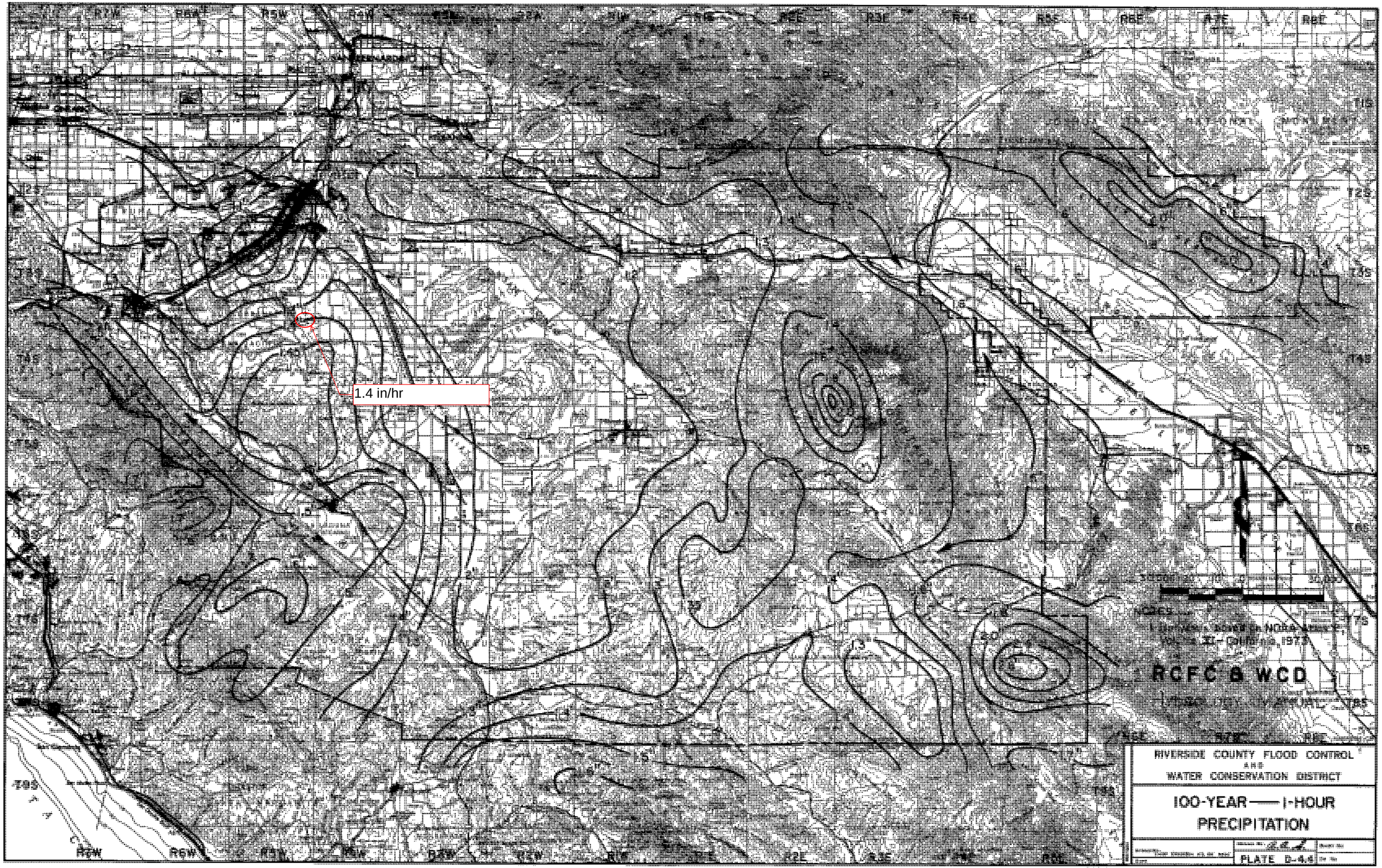
HYDROLOGY MANUAL

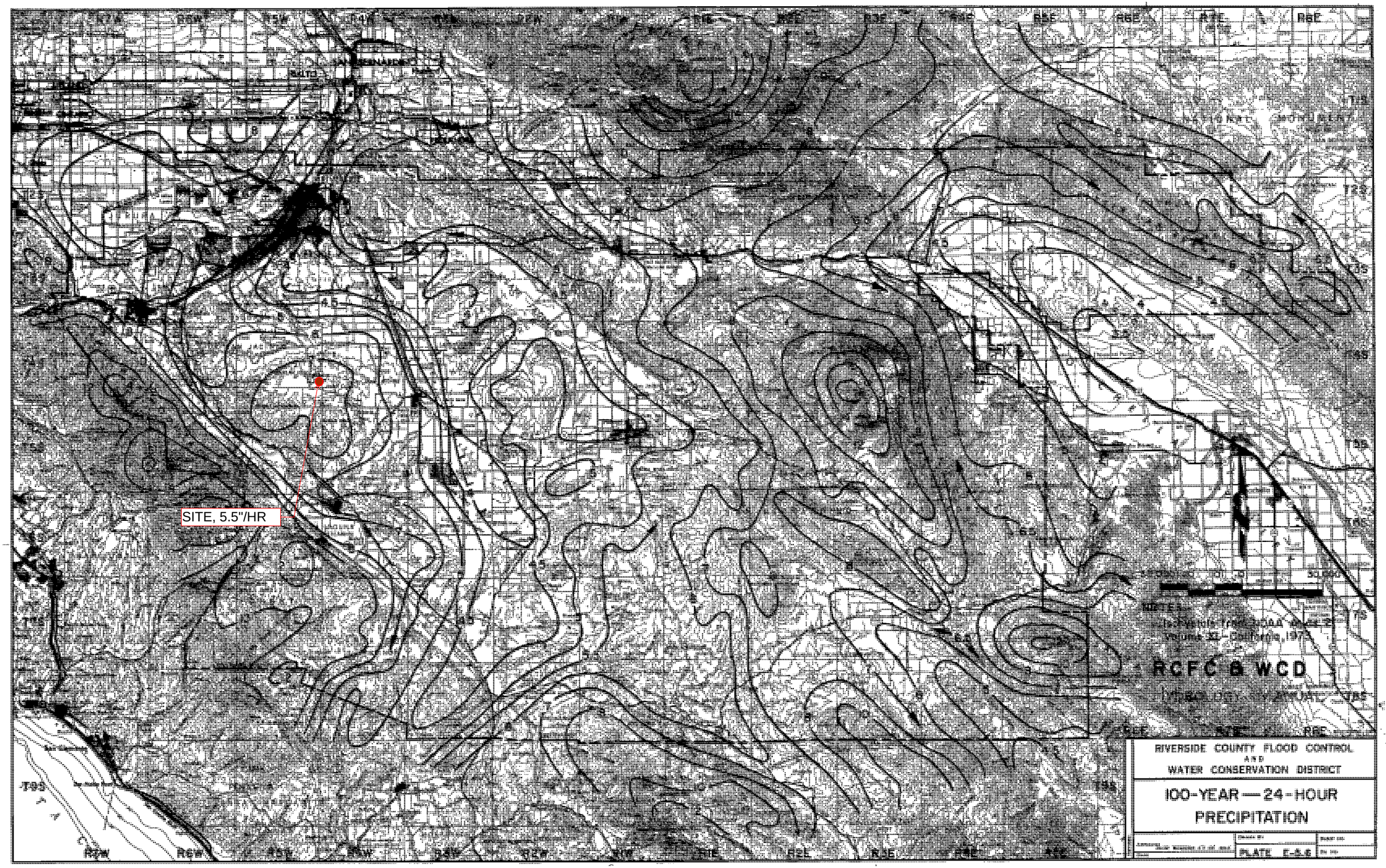
N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR STEELE PEAK

PLATE C-1.29


1.4 in/hr
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.4
RCFC & WCD


SITE, 5.5"/HR
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-6.6
RCFC & WCD

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

9.0 PERCOLATION TEST

In order to evaluate the feasibility of the proposed infiltration system, EGL has performed a total of two (2) percolation tests at the subject site based on the *Low Impact Development BMP Design Handbook* (Riverside County, 2011). Approximate locations of the test borings are shown on the Site Plan (Figure 2). The percolation tests at this time were performed on test pits TP-5 and TP-6 at depths of 5' and 9' below existing ground surface, respectively, for the proposed infiltration/detention systems. The test borings TP-5 and TP-6 were presoaked and tested on November 22, 2019. The test procedures are described as following:

- 8"-diameter × 20"-deep perforated pipes were placed in the bottom of test pits TP-5 and TP-6 for the percolation test. The bottoms of test borings were also covered with 2 inches of gravel.
- The test borings were filled with a depth of 20 inches of water multiple times for presoak and allowed to completely drain prior to refilling for the percolation test.
- For the percolation test, a depth of 20 inches of water was placed within the test borings. The test time interval between readings used was 10 minutes due to more than 6 inches of water drop two consecutive times in less than 25 minutes during the first two tests.
- Additional six (6) 10-minute increment percolation tests were performed for test borings TP-5 and TP-6, respectively. Field data of two (2) 25 minutes readings and six (6) 10 minutes readings are presented in Appendix C. The last measured drop was used to calculate the design infiltration rate of the soil. Design Infiltration rate calculations are presented in Appendix C.

Based on the soil material encountered and past experience with similar soils the absorption rate of the soil should be adequate for the proposed infiltration system for rainwater runoff at the site. Based on the results of our preliminary percolation tests of the material, the design infiltration rate is 1.18 in/hr. Reduction factor of 2.0 has been applied to our design infiltration rate. It is our opinion that dispersal of on-site storm water runoff by infiltration system is considered feasible

from a geotechnical engineering standpoint. The infiltration system and the final plumbing plans should be designed and prepared by the project Civil Engineer.

Based on the consolidation test results presented in the Appendix B all the samples collected below 5 feet showed a deformation of less than 1.0% at the time of saturation. It is EGL's opinion that hydro-consolidation of the soil due to the proposed infiltration system is negligible and should not impact the proposed structure.

Based on our review of the "*Public Safety Element, City of Riverside General Plan, Liquefaction Zones, Figure PS-2*" (Reference #4), it is concluded that the site is not located within the mapped potential liquefaction area. It is EGL's opinion that the proposed infiltration system will not increase the potential for liquefaction to occur at the site.

Due to the high percentage of sandy materials at the site it is EGL's opinion that infiltration system may be placed at the site. The infiltration system should be a minimum of 10 feet away from the building foundation and should not be surcharged by the building foundation. It is also recommended that the infiltration system be placed within natural soil and not compacted fill material. The infiltration system should also have an overflow or bypass to protect the site from flooding.

10.0 DRAINAGE

The pad should be properly drained toward the street away from the slope and structure via swales or area drains. Positive pad drainage shall be incorporated into the final plans. In no case should water be allowed to pond within the site, impound against structures, or flow in a concentrated and/or uncontrolled manner down the descending slope areas.

11.0 ASPHALT PAVEMENT

Preliminary structural pavement sections are designed according to the CalTrans Highway Design Manual and an assumed "R"-value of 40.

Location	Traffic Index	AC Thickness (inches)	Class 2 Aggregate Base Thickness (inches)	Compacted Subgrade (inches)
Parking Areas	4.5	3	5	12
Driveways	5.0	4	6	12

APPENDIX C: PERCOLATION TEST RESULTS

Infiltration Testing per Riverside County Technical Guidance Document

r (in) = radius hole

t_i (hr:min) = intial time after filling or refilling

t_f (hr:min) = final time

d_b (ft) = depth to bottom

d_i (ft) = depth to water surface at ti

d_f (ft) = depth to water surface at tf

ΔH (in) = change in height over time

Have = average head height over the time interval

t (hr) = Time reading interval

It (in/hr) = (ΔHxr)/(Δt(r+2Havg)) tested infiltration rate

TP-5									
r (in)	t_i (hr:min)	t_f (hr:min)	Δt (hr)	d_b (in)	d_i (in)	d_f (in)	ΔH (in)	H_{ave} (ft)	It (in/hr)
4	10:24	10:49	0.42	20.0	0.0	12.0	12.0	14.0	3.57
4	10:50	11:15	0.42	20.0	0.0	9.0	9.0	15.5	2.45
4	11:16	11:26	0.17	20.0	0.0	5.0	5.0	17.5	3.02
4	11:26	11:36	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	11:37	11:47	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	11:47	11:57	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	11:58	12:08	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	12:10	12:20	0.17	20.0	0.0	4.0	4.0	18.0	2.35

Factor of Safety based on the Technical Guidance Document for WQMP, Worksheet H & Tables VII.3 & VII.4

FS = 2

Design Infiltration Rate = Tested Infiltration Rate / FS (in/hour) = **1.18**

TP-6									
r (in)	t_i (hr:min)	t_f (hr:min)	t (hr)	d_b (in)	d_i (in)	d_f (in)	ΔH (in)	H_{ave} (ft)	It (in/hr)
4	11:02	11:27	0.42	20.0	0.0	13.0	13.0	13.5	3.99
4	11:41	12:06	0.42	20.0	0.0	9.0	9.0	15.5	2.45
4	12:07	12:17	0.17	20.0	0.0	5.0	5.0	17.5	3.02
4	12:19	12:29	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	12:33	12:43	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	12:47	12:57	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	12:58	13:08	0.17	20.0	0.0	4.0	4.0	18.0	2.35
4	13:10	13:20	0.17	20.0	0.0	4.0	4.0	18.0	2.35

Factor of Safety based on the Technical Guidance Document for WQMP, Worksheet H & Tables VII.3 & VII.4

FS = 2

Design Infiltration Rate = Tested Infiltration Rate / FS (in/hour) = **1.18**

WARREN AVENUE

LANDIN LANE

S 88°52'59" W 1327.85'

RETENTION BASIN

87 OVERFLOW PARKING STALLS

CONSERVATION AREA BOUNDARY LINE

177 PARKING STALLS

TP–5

TP–4

LARGE AUDITORIUM 7500 SF

LARGE MEETING RM 1 2298 SF

LARGE MEETING RM 2 2298 SF

EXHIBITION 1 2298 SF

EXHIBITION 2 2298 SF

RAY AVENUE

COLE STREET

MAIN PRAYER HALL 5025 SF

OFFICE 3151 SF

LECTURE 1 2220 SF

LIBRARY 1784 SF

TP–6

SUNDAY SCHOOL 10000 SF

LARGE DINING 3388 SF

ENSUITE 2820 SF

TP–3

DINING 852 SF

LAUNDRY 249 SF

KITCHEN 816 SF

TP–7

S-W ¼ S-W ¼ SEC. 32
T. 3 S. R. 4 W. SBB&M

S 88°28'37" W 660.00'

NORTH

SCALE: 1"=60'–0"

ONTARIO AVENUE

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

SINGLE FAMILY RESIDENCE WITH JADU AND ADU

N 0°14'41" W 1341.92'

N 0°14'41" W 660.00'

CONSERVATION AREA BOUNDARY LINE

TP–2

TP–1

S 88°28'37" W 669.83'

1329.83'

MARKHAM STREET

LEGEND

TP–1 Approximate Location of Exploratory Backhoe Test Pit No. 1 (EGL, 2019)

Environmental Geotechnology Laboratory, Inc.

Project Address:
APN: 266–320–025
Cole Avenue & Landin Lane
Riverside, California
EGL Project No. 19–283–003

Site Plan

01/2020

FIGURE 2

Rational Method Hydrology Analysis
100-yr Storm Event
(Developed Condition)

Phase-I Developed Condition-Onsite

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
       Rational Hydrology Study        Date: 09/17/20  File:DEV2.out
------------------------------------------------------------------------
RIVERSIDE TEMPLE-PH1 Onsite Only
100-YR STORM EVENT
DEVELOPED CONDITION

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

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

------------------------------------------------------------------------


Program License Serial Number 5028

------------------------------------------------------------------------
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 [ Riverside ] area used.
10 year storm 10 minute intensity =  1.880(In/Hr)
10 year storm 60 minute intensity =  0.700(In/Hr)
100 year storm 10 minute intensity =  2.680(In/Hr)
100 year storm 60 minute intensity =  1.000(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.000(In/Hr)
Slope of intensity duration curve = 0.5500




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   575.000(Ft.)
Top (of initial area) elevation =  1711.000(Ft.)
Bottom (of initial area) elevation =  1686.000(Ft.)
Difference in elevation =    25.000(Ft.)
Slope =    0.04348  s(percent)=       4.35
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.799 min.
Rainfall intensity =      2.874(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      8.626(CFS)
Total initial stream area =        3.500(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
```

```
Top of street segment elevation =  1686.000(Ft.)
End of street segment elevation =  1665.000(Ft.)
Length of street segment  =   376.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  15.000(Ft.)
Distance from crown to crossfall grade break  =   8.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  0.020(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     13.299(CFS)
Depth of flow =   0.189(Ft.), Average velocity =   5.320(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  11.350(Ft.)
Flow velocity =   5.32(Ft/s)
Travel time =    1.18 min.     TC =    9.98  min.
 Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.855
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      2.683(In/Hr) for a   100.0 year storm
Subarea runoff =      9.172(CFS) for      4.000(Ac.)
Total runoff =     17.798(CFS)        Total area =       7.500(Ac.)
Street flow at end of street =     17.798(CFS)
Half street flow at end of street =      8.899(CFS)
Depth of flow =   0.214(Ft.), Average velocity =   5.729(Ft/s)
Flow width (from curb towards crown)=  12.616(Ft.)
End of computations, total study area =            7.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.350
Area averaged RI index number =  56.0
```

Phase-II Future Developed Condition-Onsite

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
       Rational Hydrology Study        Date: 10/14/20  File:DEV2.out
------------------------------------------------------------------------
RIVERSIDE TEMPLE-PH2  Onsite Only
100-YR STORM EVENT
DEVELOPED CONDITION

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

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

------------------------------------------------------------------------


Program License Serial Number 5028

------------------------------------------------------------------------
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 [ Riverside ] area used.
10 year storm 10 minute intensity =  1.880(In/Hr)
10 year storm 60 minute intensity =  0.700(In/Hr)
100 year storm 10 minute intensity =  2.680(In/Hr)
100 year storm 60 minute intensity =  1.000(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.000(In/Hr)
Slope of intensity duration curve = 0.5500




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   560.000(Ft.)
Top (of initial area) elevation =  1698.000(Ft.)
Bottom (of initial area) elevation =  1681.000(Ft.)
Difference in elevation =    17.000(Ft.)
Slope =    0.03036  s(percent)=       3.04
TC = k(0.480)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.136 min.
Rainfall intensity =      2.409(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.787
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.800; Impervious fraction =  0.200
Initial subarea runoff =     10.991(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.800


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
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```
Top of street segment elevation =  1681.000(Ft.)
End of street segment elevation =  1669.000(Ft.)
Length of street segment  =   290.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  15.000(Ft.)
Distance from crown to crossfall grade break  =   7.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  0.017(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     13.488(CFS)
Depth of flow =   0.211(Ft.), Average velocity =   4.786(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  11.960(Ft.)
Flow velocity =   4.79(Ft/s)
Travel time =    1.01 min.     TC =   13.15  min.
 Adding area flow to street
SINGLE FAMILY (1 Acre Lot)
Runoff Coefficient = 0.783
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.800; Impervious fraction =  0.200
Rainfall intensity =      2.305(In/Hr) for a   100.0 year storm
Subarea runoff =      4.870(CFS) for      2.700(Ac.)
Total runoff =     15.862(CFS)        Total area =       8.500(Ac.)
Street flow at end of street =     15.862(CFS)
Half street flow at end of street =      7.931(CFS)
Depth of flow =   0.225(Ft.), Average velocity =   4.986(Ft/s)
Flow width (from curb towards crown)=  12.697(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
```

```
Upstream point/station elevation =  1669.000(Ft.)
Downstream point/station elevation =  1664.000(Ft.)
Pipe length  =   430.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =    15.862(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    15.862(CFS)
Normal flow depth in pipe =   15.52(In.)
Flow top width inside pipe =   22.95(In.)
Critical Depth =   17.23(In.)
Pipe flow velocity =      7.39(Ft/s)
Travel time through pipe =    0.97 min.
Time of concentration (TC) =    14.12 min.
End of computations, total study area =            8.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.800
Area averaged RI index number =  56.0
```

Unit Hydrograph Analysis
100-yr, 24-hr Duration Storm Event
(Developed Condition)

Phase-I Developed Condition-Onsite

```
       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 - 2004, Version 7.0
              Study date  09/22/20 File: UH2DEV24100.out


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------------------------------------------------------------------------------

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


Program License Serial Number 5028

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

 English Units used in output format



------------------------------------------------------------------------
RIVERSIDE TEMPLE PH1
100YR 24 HR STORMEVENT
DEVELOPED CONDITION

------------------------------------------------------------------------
Drainage Area =       7.50(Ac.)  =      0.012 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       7.50(Ac.)  =      0.012 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.98 Min.
25% of lag time =     2.00 Min.
40% of lag time =     3.19 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]
        7.50           2.20                 16.50

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        7.50           5.50                 41.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    2.200(In)
Area Averaged 100-Year Rainfall =    5.500(In)

Point rain (area averaged) =    5.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    5.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     7.500           56.00          0.650
 Total Area Entered =      7.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  74.8      0.305     0.650        0.127       1.000      0.127
                                                  Sum (F) =   0.127
```

Area averaged mean soil loss (F) (In/Hr) = 0.127
Minimum soil loss rate ((In/Hr)) = 0.063
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.380

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	62.657	8.828	0.667
2	0.167	125.313	35.780	2.704
3	0.250	187.970	25.686	1.941
4	0.333	250.627	9.884	0.747
5	0.417	313.283	5.929	0.448
6	0.500	375.940	3.983	0.301
7	0.583	438.596	2.786	0.211
8	0.667	501.253	2.018	0.153
9	0.750	563.910	1.615	0.122
10	0.833	626.566	1.181	0.089
11	0.917	689.223	0.870	0.066
12	1.000	751.880	0.644	0.049
13	1.083	814.536	0.794	0.060
		Sum = 100.000	Sum=	7.559

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.044	0.225	0.017	0.03
2	0.17	0.07	0.044	0.224	0.017	0.03
3	0.25	0.07	0.044	0.223	0.017	0.03
4	0.33	0.10	0.066	0.222	0.025	0.04
5	0.42	0.10	0.066	0.221	0.025	0.04
6	0.50	0.10	0.066	0.220	0.025	0.04
7	0.58	0.10	0.066	0.219	0.025	0.04
8	0.67	0.10	0.066	0.219	0.025	0.04
9	0.75	0.10	0.066	0.218	0.025	0.04
10	0.83	0.13	0.088	0.217	0.033	0.05
11	0.92	0.13	0.088	0.216	0.033	0.05
12	1.00	0.13	0.088	0.215	0.033	0.05
13	1.08	0.10	0.066	0.214	0.025	0.04
14	1.17	0.10	0.066	0.213	0.025	0.04
15	1.25	0.10	0.066	0.213	0.025	0.04
16	1.33	0.10	0.066	0.212	0.025	0.04
17	1.42	0.10	0.066	0.211	0.025	0.04
18	1.50	0.10	0.066	0.210	0.025	0.04
19	1.58	0.10	0.066	0.209	0.025	0.04
20	1.67	0.10	0.066	0.208	0.025	0.04
21	1.75	0.10	0.066	0.208	0.025	0.04
22	1.83	0.13	0.088	0.207	0.033	0.05
23	1.92	0.13	0.088	0.206	0.033	0.05
24	2.00	0.13	0.088	0.205	0.033	0.05
25	2.08	0.13	0.088	0.204	0.033	0.05
26	2.17	0.13	0.088	0.203	0.033	0.05
27	2.25	0.13	0.088	0.203	0.033	0.05
28	2.33	0.13	0.088	0.202	0.033	0.05
29	2.42	0.13	0.088	0.201	0.033	0.05
30	2.50	0.13	0.088	0.200	0.033	0.05
31	2.58	0.17	0.110	0.199	0.042	0.07
32	2.67	0.17	0.110	0.199	0.042	0.07
33	2.75	0.17	0.110	0.198	0.042	0.07
34	2.83	0.17	0.110	0.197	0.042	0.07
35	2.92	0.17	0.110	0.196	0.042	0.07
36	3.00	0.17	0.110	0.195	0.042	0.07
37	3.08	0.17	0.110	0.194	0.042	0.07
38	3.17	0.17	0.110	0.194	0.042	0.07

39	3.25	0.17	0.110	0.193	0.042	0.07
40	3.33	0.17	0.110	0.192	0.042	0.07
41	3.42	0.17	0.110	0.191	0.042	0.07
42	3.50	0.17	0.110	0.190	0.042	0.07
43	3.58	0.17	0.110	0.190	0.042	0.07
44	3.67	0.17	0.110	0.189	0.042	0.07
45	3.75	0.17	0.110	0.188	0.042	0.07
46	3.83	0.20	0.132	0.187	0.050	0.08
47	3.92	0.20	0.132	0.186	0.050	0.08
48	4.00	0.20	0.132	0.186	0.050	0.08
49	4.08	0.20	0.132	0.185	0.050	0.08
50	4.17	0.20	0.132	0.184	0.050	0.08
51	4.25	0.20	0.132	0.183	0.050	0.08
52	4.33	0.23	0.154	0.183	0.059	0.10
53	4.42	0.23	0.154	0.182	0.059	0.10
54	4.50	0.23	0.154	0.181	0.059	0.10
55	4.58	0.23	0.154	0.180	0.059	0.10
56	4.67	0.23	0.154	0.179	0.059	0.10
57	4.75	0.23	0.154	0.179	0.059	0.10
58	4.83	0.27	0.176	0.178	0.067	0.11
59	4.92	0.27	0.176	0.177	0.067	0.11
60	5.00	0.27	0.176	0.176	0.067	0.11
61	5.08	0.20	0.132	0.176	0.050	0.08
62	5.17	0.20	0.132	0.175	0.050	0.08
63	5.25	0.20	0.132	0.174	0.050	0.08
64	5.33	0.23	0.154	0.173	0.059	0.10
65	5.42	0.23	0.154	0.173	0.059	0.10
66	5.50	0.23	0.154	0.172	0.059	0.10
67	5.58	0.27	0.176	0.171	---	0.00
68	5.67	0.27	0.176	0.170	---	0.01
69	5.75	0.27	0.176	0.170	---	0.01
70	5.83	0.27	0.176	0.169	---	0.01
71	5.92	0.27	0.176	0.168	---	0.01
72	6.00	0.27	0.176	0.167	---	0.01
73	6.08	0.30	0.198	0.167	---	0.03
74	6.17	0.30	0.198	0.166	---	0.03
75	6.25	0.30	0.198	0.165	---	0.03
76	6.33	0.30	0.198	0.164	---	0.03
77	6.42	0.30	0.198	0.164	---	0.03
78	6.50	0.30	0.198	0.163	---	0.04
79	6.58	0.33	0.220	0.162	---	0.06
80	6.67	0.33	0.220	0.161	---	0.06
81	6.75	0.33	0.220	0.161	---	0.06
82	6.83	0.33	0.220	0.160	---	0.06
83	6.92	0.33	0.220	0.159	---	0.06
84	7.00	0.33	0.220	0.158	---	0.06
85	7.08	0.33	0.220	0.158	---	0.06
86	7.17	0.33	0.220	0.157	---	0.06
87	7.25	0.33	0.220	0.156	---	0.06
88	7.33	0.37	0.242	0.156	---	0.09
89	7.42	0.37	0.242	0.155	---	0.09
90	7.50	0.37	0.242	0.154	---	0.09
91	7.58	0.40	0.264	0.153	---	0.11
92	7.67	0.40	0.264	0.153	---	0.11
93	7.75	0.40	0.264	0.152	---	0.11
94	7.83	0.43	0.286	0.151	---	0.13
95	7.92	0.43	0.286	0.151	---	0.14
96	8.00	0.43	0.286	0.150	---	0.14
97	8.08	0.50	0.330	0.149	---	0.18
98	8.17	0.50	0.330	0.149	---	0.18
99	8.25	0.50	0.330	0.148	---	0.18
100	8.33	0.50	0.330	0.147	---	0.18
101	8.42	0.50	0.330	0.147	---	0.18
102	8.50	0.50	0.330	0.146	---	0.18
103	8.58	0.53	0.352	0.145	---	0.21
104	8.67	0.53	0.352	0.144	---	0.21
105	8.75	0.53	0.352	0.144	---	0.21
106	8.83	0.57	0.374	0.143	---	0.23
107	8.92	0.57	0.374	0.142	---	0.23
108	9.00	0.57	0.374	0.142	---	0.23
109	9.08	0.63	0.418	0.141	---	0.28

110	9.17	0.63	0.418	0.140	---	0.28
111	9.25	0.63	0.418	0.140	---	0.28
112	9.33	0.67	0.440	0.139	---	0.30
113	9.42	0.67	0.440	0.138	---	0.30
114	9.50	0.67	0.440	0.138	---	0.30
115	9.58	0.70	0.462	0.137	---	0.32
116	9.67	0.70	0.462	0.136	---	0.33
117	9.75	0.70	0.462	0.136	---	0.33
118	9.83	0.73	0.484	0.135	---	0.35
119	9.92	0.73	0.484	0.134	---	0.35
120	10.00	0.73	0.484	0.134	---	0.35
121	10.08	0.50	0.330	0.133	---	0.20
122	10.17	0.50	0.330	0.133	---	0.20
123	10.25	0.50	0.330	0.132	---	0.20
124	10.33	0.50	0.330	0.131	---	0.20
125	10.42	0.50	0.330	0.131	---	0.20
126	10.50	0.50	0.330	0.130	---	0.20
127	10.58	0.67	0.440	0.129	---	0.31
128	10.67	0.67	0.440	0.129	---	0.31
129	10.75	0.67	0.440	0.128	---	0.31
130	10.83	0.67	0.440	0.127	---	0.31
131	10.92	0.67	0.440	0.127	---	0.31
132	11.00	0.67	0.440	0.126	---	0.31
133	11.08	0.63	0.418	0.126	---	0.29
134	11.17	0.63	0.418	0.125	---	0.29
135	11.25	0.63	0.418	0.124	---	0.29
136	11.33	0.63	0.418	0.124	---	0.29
137	11.42	0.63	0.418	0.123	---	0.29
138	11.50	0.63	0.418	0.123	---	0.30
139	11.58	0.57	0.374	0.122	---	0.25
140	11.67	0.57	0.374	0.121	---	0.25
141	11.75	0.57	0.374	0.121	---	0.25
142	11.83	0.60	0.396	0.120	---	0.28
143	11.92	0.60	0.396	0.119	---	0.28
144	12.00	0.60	0.396	0.119	---	0.28
145	12.08	0.83	0.550	0.118	---	0.43
146	12.17	0.83	0.550	0.118	---	0.43
147	12.25	0.83	0.550	0.117	---	0.43
148	12.33	0.87	0.572	0.117	---	0.46
149	12.42	0.87	0.572	0.116	---	0.46
150	12.50	0.87	0.572	0.115	---	0.46
151	12.58	0.93	0.616	0.115	---	0.50
152	12.67	0.93	0.616	0.114	---	0.50
153	12.75	0.93	0.616	0.114	---	0.50
154	12.83	0.97	0.638	0.113	---	0.52
155	12.92	0.97	0.638	0.112	---	0.53
156	13.00	0.97	0.638	0.112	---	0.53
157	13.08	1.13	0.748	0.111	---	0.64
158	13.17	1.13	0.748	0.111	---	0.64
159	13.25	1.13	0.748	0.110	---	0.64
160	13.33	1.13	0.748	0.110	---	0.64
161	13.42	1.13	0.748	0.109	---	0.64
162	13.50	1.13	0.748	0.109	---	0.64
163	13.58	0.77	0.506	0.108	---	0.40
164	13.67	0.77	0.506	0.107	---	0.40
165	13.75	0.77	0.506	0.107	---	0.40
166	13.83	0.77	0.506	0.106	---	0.40
167	13.92	0.77	0.506	0.106	---	0.40
168	14.00	0.77	0.506	0.105	---	0.40
169	14.08	0.90	0.594	0.105	---	0.49
170	14.17	0.90	0.594	0.104	---	0.49
171	14.25	0.90	0.594	0.104	---	0.49
172	14.33	0.87	0.572	0.103	---	0.47
173	14.42	0.87	0.572	0.103	---	0.47
174	14.50	0.87	0.572	0.102	---	0.47
175	14.58	0.87	0.572	0.102	---	0.47
176	14.67	0.87	0.572	0.101	---	0.47
177	14.75	0.87	0.572	0.101	---	0.47
178	14.83	0.83	0.550	0.100	---	0.45
179	14.92	0.83	0.550	0.099	---	0.45
180	15.00	0.83	0.550	0.099	---	0.45

181	15.08	0.80	0.528	0.098	---	0.43
182	15.17	0.80	0.528	0.098	---	0.43
183	15.25	0.80	0.528	0.097	---	0.43
184	15.33	0.77	0.506	0.097	---	0.41
185	15.42	0.77	0.506	0.096	---	0.41
186	15.50	0.77	0.506	0.096	---	0.41
187	15.58	0.63	0.418	0.095	---	0.32
188	15.67	0.63	0.418	0.095	---	0.32
189	15.75	0.63	0.418	0.095	---	0.32
190	15.83	0.63	0.418	0.094	---	0.32
191	15.92	0.63	0.418	0.094	---	0.32
192	16.00	0.63	0.418	0.093	---	0.32
193	16.08	0.13	0.088	0.093	0.033	0.05
194	16.17	0.13	0.088	0.092	0.033	0.05
195	16.25	0.13	0.088	0.092	0.033	0.05
196	16.33	0.13	0.088	0.091	0.033	0.05
197	16.42	0.13	0.088	0.091	0.033	0.05
198	16.50	0.13	0.088	0.090	0.033	0.05
199	16.58	0.10	0.066	0.090	0.025	0.04
200	16.67	0.10	0.066	0.089	0.025	0.04
201	16.75	0.10	0.066	0.089	0.025	0.04
202	16.83	0.10	0.066	0.088	0.025	0.04
203	16.92	0.10	0.066	0.088	0.025	0.04
204	17.00	0.10	0.066	0.088	0.025	0.04
205	17.08	0.17	0.110	0.087	---	0.02
206	17.17	0.17	0.110	0.087	---	0.02
207	17.25	0.17	0.110	0.086	---	0.02
208	17.33	0.17	0.110	0.086	---	0.02
209	17.42	0.17	0.110	0.085	---	0.02
210	17.50	0.17	0.110	0.085	---	0.03
211	17.58	0.17	0.110	0.085	---	0.03
212	17.67	0.17	0.110	0.084	---	0.03
213	17.75	0.17	0.110	0.084	---	0.03
214	17.83	0.13	0.088	0.083	---	0.00
215	17.92	0.13	0.088	0.083	---	0.01
216	18.00	0.13	0.088	0.082	---	0.01
217	18.08	0.13	0.088	0.082	---	0.01
218	18.17	0.13	0.088	0.082	---	0.01
219	18.25	0.13	0.088	0.081	---	0.01
220	18.33	0.13	0.088	0.081	---	0.01
221	18.42	0.13	0.088	0.080	---	0.01
222	18.50	0.13	0.088	0.080	---	0.01
223	18.58	0.10	0.066	0.080	0.025	0.04
224	18.67	0.10	0.066	0.079	0.025	0.04
225	18.75	0.10	0.066	0.079	0.025	0.04
226	18.83	0.07	0.044	0.079	0.017	0.03
227	18.92	0.07	0.044	0.078	0.017	0.03
228	19.00	0.07	0.044	0.078	0.017	0.03
229	19.08	0.10	0.066	0.077	0.025	0.04
230	19.17	0.10	0.066	0.077	0.025	0.04
231	19.25	0.10	0.066	0.077	0.025	0.04
232	19.33	0.13	0.088	0.076	---	0.01
233	19.42	0.13	0.088	0.076	---	0.01
234	19.50	0.13	0.088	0.076	---	0.01
235	19.58	0.10	0.066	0.075	0.025	0.04
236	19.67	0.10	0.066	0.075	0.025	0.04
237	19.75	0.10	0.066	0.075	0.025	0.04
238	19.83	0.07	0.044	0.074	0.017	0.03
239	19.92	0.07	0.044	0.074	0.017	0.03
240	20.00	0.07	0.044	0.074	0.017	0.03
241	20.08	0.10	0.066	0.073	0.025	0.04
242	20.17	0.10	0.066	0.073	0.025	0.04
243	20.25	0.10	0.066	0.073	0.025	0.04
244	20.33	0.10	0.066	0.072	0.025	0.04
245	20.42	0.10	0.066	0.072	0.025	0.04
246	20.50	0.10	0.066	0.072	0.025	0.04
247	20.58	0.10	0.066	0.071	0.025	0.04
248	20.67	0.10	0.066	0.071	0.025	0.04
249	20.75	0.10	0.066	0.071	0.025	0.04
250	20.83	0.07	0.044	0.071	0.017	0.03
251	20.92	0.07	0.044	0.070	0.017	0.03

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252  21.00     0.07      0.044         0.070     0.017         0.03
253  21.08     0.10      0.066         0.070     0.025         0.04
254  21.17     0.10      0.066         0.069     0.025         0.04
255  21.25     0.10      0.066         0.069     0.025         0.04
256  21.33     0.07      0.044         0.069     0.017         0.03
257  21.42     0.07      0.044         0.069     0.017         0.03
258  21.50     0.07      0.044         0.068     0.017         0.03
259  21.58     0.10      0.066         0.068     0.025         0.04
260  21.67     0.10      0.066         0.068     0.025         0.04
261  21.75     0.10      0.066         0.068     0.025         0.04
262  21.83     0.07      0.044         0.067     0.017         0.03
263  21.92     0.07      0.044         0.067     0.017         0.03
264  22.00     0.07      0.044         0.067     0.017         0.03
265  22.08     0.10      0.066         0.067     0.025         0.04
266  22.17     0.10      0.066         0.066     0.025         0.04
267  22.25     0.10      0.066         0.066     0.025         0.04
268  22.33     0.07      0.044         0.066     0.017         0.03
269  22.42     0.07      0.044         0.066     0.017         0.03
270  22.50     0.07      0.044         0.066     0.017         0.03
271  22.58     0.07      0.044         0.065     0.017         0.03
272  22.67     0.07      0.044         0.065     0.017         0.03
273  22.75     0.07      0.044         0.065     0.017         0.03
274  22.83     0.07      0.044         0.065     0.017         0.03
275  22.92     0.07      0.044         0.065     0.017         0.03
276  23.00     0.07      0.044         0.065     0.017         0.03
277  23.08     0.07      0.044         0.064     0.017         0.03
278  23.17     0.07      0.044         0.064     0.017         0.03
279  23.25     0.07      0.044         0.064     0.017         0.03
280  23.33     0.07      0.044         0.064     0.017         0.03
281  23.42     0.07      0.044         0.064     0.017         0.03
282  23.50     0.07      0.044         0.064     0.017         0.03
283  23.58     0.07      0.044         0.064     0.017         0.03
284  23.67     0.07      0.044         0.064     0.017         0.03
285  23.75     0.07      0.044         0.064     0.017         0.03
286  23.83     0.07      0.044         0.063     0.017         0.03
287  23.92     0.07      0.044         0.063     0.017         0.03
288  24.00     0.07      0.044         0.063     0.017         0.03
    Sum =     100.0                                 Sum =    43.7
      Flood volume = Effective rainfall      3.64(In)
       times area       7.5(Ac.)/[(In)/(Ft.)] =       2.3(Ac.Ft)
      Total soil loss =      1.86(In)
      Total soil loss =     1.160(Ac.Ft)
      Total rainfall =      5.50(In)
      Flood volume =       99201.0 Cubic Feet
      Total soil loss =       50534.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      4.735(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------------
   0+ 5       0.0001      0.02  Q         |         |         |         |
   0+10       0.0008      0.09  Q         |         |         |         |
   0+15       0.0018      0.15  Q         |         |         |         |
   0+20       0.0030      0.17  Q         |         |         |         |
   0+25       0.0045      0.22  Q         |         |         |         |
   0+30       0.0063      0.26  VQ        |         |         |         |
   0+35       0.0082      0.27  VQ        |         |         |         |
   0+40       0.0101      0.28  VQ        |         |         |         |
   0+45       0.0121      0.29  VQ        |         |         |         |
   0+50       0.0143      0.31  VQ        |         |         |         |
   0+55       0.0166      0.35  VQ        |         |         |         |
   1+ 0       0.0192      0.38  VQ        |         |         |         |
   1+ 5       0.0219      0.38  VQ        |         |         |         |
   1+10       0.0243      0.35  VQ        |         |         |         |
```
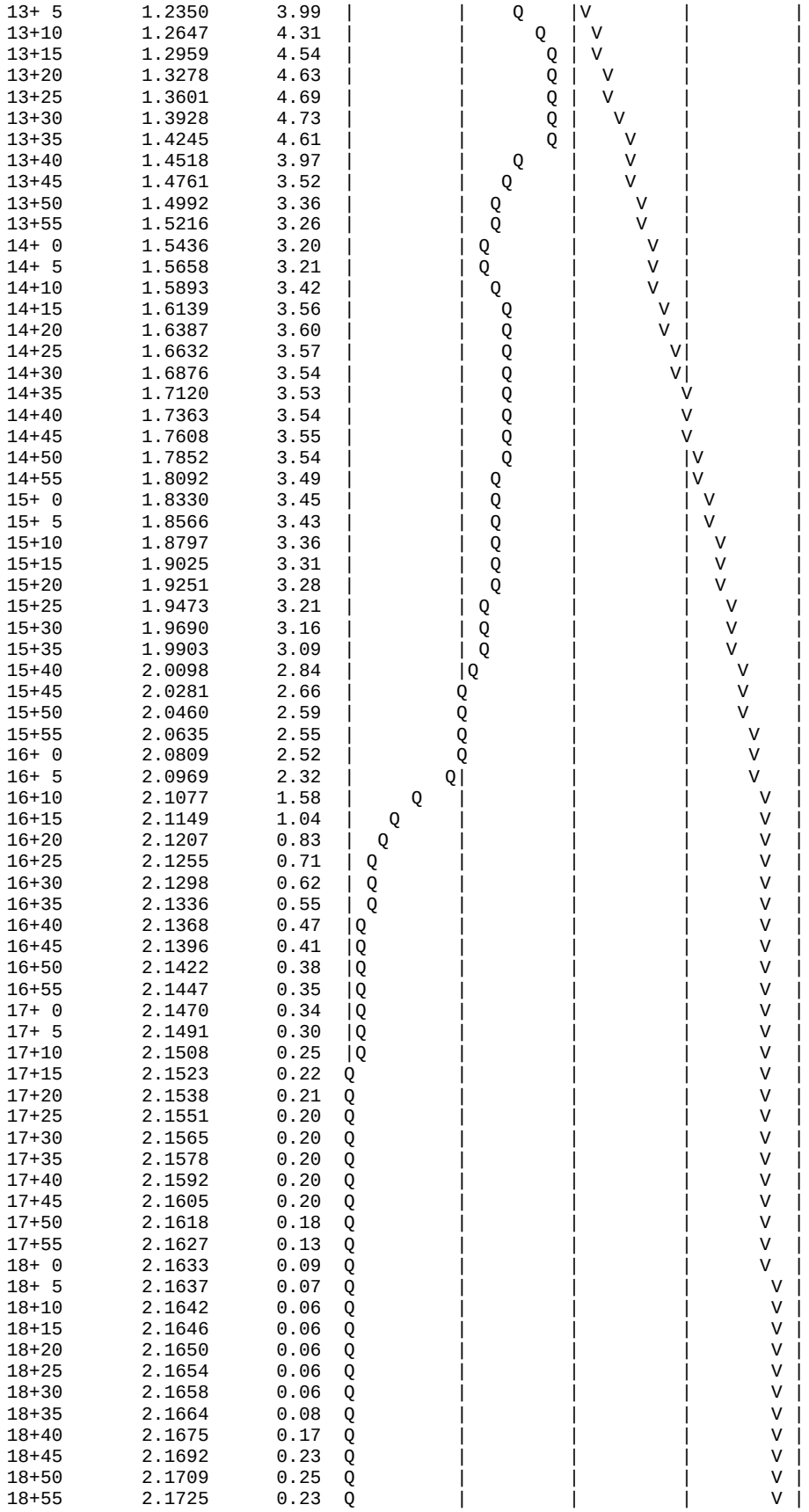
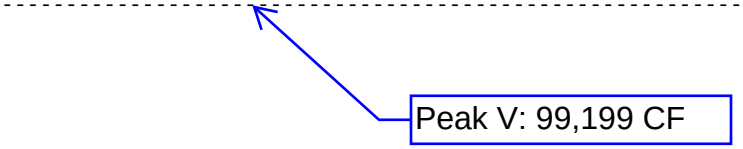

1+15	0.0265	0.33	VQ	|	|	|	|
1+20	0.0288	0.32	VQ	|	|	|	|
1+25	0.0310	0.32	VQ	|	|	|	|
1+30	0.0331	0.32	VQ	|	|	|	|
1+35	0.0353	0.31	VQ	|	|	|	|
1+40	0.0375	0.31	VQ	|	|	|	|
1+45	0.0396	0.31	VQ	|	|	|	|
1+50	0.0418	0.32	VQ	|	|	|	|
1+55	0.0443	0.36	VQ	|	|	|	|
2+ 0	0.0469	0.38	VQ	|	|	|	|
2+ 5	0.0496	0.39	VQ	|	|	|	|
2+10	0.0524	0.40	VQ	|	|	|	|
2+15	0.0551	0.40	VQ	|	|	|	|
2+20	0.0579	0.41	|Q	|	|	|	|
2+25	0.0607	0.41	|Q	|	|	|	|
2+30	0.0635	0.41	|Q	|	|	|	|
2+35	0.0664	0.42	|Q	|	|	|	|
2+40	0.0696	0.46	|Q	|	|	|	|
2+45	0.0729	0.48	|Q	|	|	|	|
2+50	0.0763	0.50	|Q	|	|	|	|
2+55	0.0798	0.50	|VQ	|	|	|	|
3+ 0	0.0833	0.51	|VQ	|	|	|	|
3+ 5	0.0868	0.51	|VQ	|	|	|	|
3+10	0.0903	0.51	|VQ	|	|	|	|
3+15	0.0938	0.51	|VQ	|	|	|	|
3+20	0.0973	0.51	|VQ	|	|	|	|
3+25	0.1009	0.51	|VQ	|	|	|	|
3+30	0.1044	0.51	|VQ	|	|	|	|
3+35	0.1080	0.52	|VQ	|	|	|	|
3+40	0.1115	0.52	|VQ	|	|	|	|
3+45	0.1151	0.52	| Q	|	|	|	|
3+50	0.1187	0.52	| Q	|	|	|	|
3+55	0.1226	0.56	| Q	|	|	|	|
4+ 0	0.1266	0.59	| Q	|	|	|	|
4+ 5	0.1307	0.60	| Q	|	|	|	|
4+10	0.1349	0.60	| Q	|	|	|	|
4+15	0.1391	0.61	| Q	|	|	|	|
4+20	0.1434	0.62	| Q	|	|	|	|
4+25	0.1479	0.66	| Q	|	|	|	|
4+30	0.1526	0.69	| Q	|	|	|	|
4+35	0.1575	0.70	| Q	|	|	|	|
4+40	0.1623	0.71	| Q	|	|	|	|
4+45	0.1672	0.71	| Q	|	|	|	|
4+50	0.1722	0.72	| QV	|	|	|	|
4+55	0.1775	0.76	| Q	|	|	|	|
5+ 0	0.1829	0.79	| Q	|	|	|	|
5+ 5	0.1883	0.78	| Q	|	|	|	|
5+10	0.1933	0.72	| QV	|	|	|	|
5+15	0.1979	0.67	| QV	|	|	|	|
5+20	0.2024	0.66	| QV	|	|	|	|
5+25	0.2072	0.69	| QV	|	|	|	|
5+30	0.2120	0.71	| QV	|	|	|	|
5+35	0.2165	0.65	| QV	|	|	|	|
5+40	0.2194	0.41	|Q V	|	|	|	|
5+45	0.2210	0.24	Q V	|	|	|	|
5+50	0.2223	0.18	Q V	|	|	|	|
5+55	0.2232	0.14	Q V	|	|	|	|
6+ 0	0.2241	0.12	Q V	|	|	|	|
6+ 5	0.2249	0.12	Q V	|	|	|	|
6+10	0.2261	0.17	Q V	|	|	|	|
6+15	0.2275	0.21	Q V	|	|	|	|
6+20	0.2291	0.22	Q V	|	|	|	|
6+25	0.2307	0.23	Q V	|	|	|	|
6+30	0.2323	0.24	Q V	|	|	|	|
6+35	0.2341	0.26	|Q V	|	|	|	|
6+40	0.2364	0.33	|Q V	|	|	|	|
6+45	0.2390	0.38	|Q V	|	|	|	|
6+50	0.2418	0.40	|Q V	|	|	|	|
6+55	0.2447	0.42	|Q V	|	|	|	|
7+ 0	0.2477	0.43	|Q V	|	|	|	|
7+ 5	0.2508	0.45	|Q V	|	|	|	|

7+10	0.2539	0.45	Q V				
7+15	0.2571	0.46	Q V				
7+20	0.2604	0.48	Q V				
7+25	0.2642	0.55	Q V				
7+30	0.2683	0.60	Q V				
7+35	0.2727	0.64	Q V				
7+40	0.2776	0.71	Q V				
7+45	0.2829	0.77	QV				
7+50	0.2885	0.81	Q V				
7+55	0.2946	0.89	Q V				
8+ 0	0.3011	0.94	Q V				
8+ 5	0.3080	1.00	QV				
8+10	0.3159	1.14	QV				
8+15	0.3244	1.24	QV				
8+20	0.3333	1.29	Q				
8+25	0.3424	1.32	QV				
8+30	0.3516	1.34	QV				
8+35	0.3611	1.37	QV				
8+40	0.3710	1.45	QV				
8+45	0.3813	1.50	QV				
8+50	0.3920	1.54	Q				
8+55	0.4031	1.62	QV				
9+ 0	0.4146	1.68	QV				
9+ 5	0.4266	1.73	QV				
9+10	0.4395	1.87	Q				
9+15	0.4530	1.97	Q				
9+20	0.4670	2.03	Q				
9+25	0.4816	2.12	Q				
9+30	0.4967	2.18	Q				
9+35	0.5120	2.23	Q				
9+40	0.5280	2.32	Q				
9+45	0.5444	2.38	Q				
9+50	0.5610	2.42	Q				
9+55	0.5783	2.50	Q				
10+ 0	0.5959	2.56	Q				
10+ 5	0.6131	2.49	QV				
10+10	0.6275	2.09	Q V				
10+15	0.6399	1.81	Q V				
10+20	0.6517	1.71	Q V				
10+25	0.6630	1.65	Q V				
10+30	0.6741	1.61	Q V				
10+35	0.6855	1.66	Q V				
10+40	0.6989	1.94	Q V				
10+45	0.7136	2.14	Q V				
10+50	0.7289	2.21	Q V				
10+55	0.7444	2.26	Q V				
11+ 0	0.7602	2.29	Q V				
11+ 5	0.7760	2.29	Q V				
11+10	0.7915	2.25	Q V				
11+15	0.8069	2.23	Q V				
11+20	0.8222	2.23	Q V				
11+25	0.8376	2.23	Q V				
11+30	0.8529	2.23	Q V				
11+35	0.8682	2.21	Q V				
11+40	0.8826	2.09	Q V				
11+45	0.8964	2.01	Q V				
11+50	0.9101	1.99	Q V				
11+55	0.9242	2.04	Q V				
12+ 0	0.9384	2.07	Q V				
12+ 5	0.9535	2.18	Q V				
12+10	0.9714	2.61	Q V				
12+15	0.9915	2.91	Q V				
12+20	1.0125	3.05	Q V				
12+25	1.0344	3.18	Q V				
12+30	1.0569	3.27	Q V				
12+35	1.0800	3.36	Q V				
12+40	1.1042	3.51	Q V				
12+45	1.1293	3.63	Q V				
12+50	1.1548	3.70	Q V				
12+55	1.1809	3.80	Q V				
13+ 0	1.2076	3.87	Q V				



19+ 0	2.1739	0.21	Q	|	|	|	V |
19+ 5	2.1754	0.22	Q	|	|	|	V |
19+10	2.1772	0.25	|Q	|	|	|	V |
19+15	2.1791	0.28	|Q	|	|	|	V |
19+20	2.1810	0.27	|Q	|	|	|	V |
19+25	2.1823	0.20	Q	|	|	|	V |
19+30	2.1833	0.15	Q	|	|	|	V |
19+35	2.1844	0.15	Q	|	|	|	V |
19+40	2.1858	0.22	Q	|	|	|	V |
19+45	2.1877	0.26	|Q	|	|	|	V |
19+50	2.1895	0.27	|Q	|	|	|	V |
19+55	2.1912	0.24	Q	|	|	|	V |
20+ 0	2.1927	0.22	Q	|	|	|	V |
20+ 5	2.1943	0.23	Q	|	|	|	V |
20+10	2.1961	0.26	|Q	|	|	|	V |
20+15	2.1980	0.28	|Q	|	|	|	V |
20+20	2.2000	0.29	|Q	|	|	|	V |
20+25	2.2021	0.30	|Q	|	|	|	V |
20+30	2.2041	0.30	|Q	|	|	|	V |
20+35	2.2062	0.30	|Q	|	|	|	V |
20+40	2.2083	0.31	|Q	|	|	|	V |
20+45	2.2105	0.31	|Q	|	|	|	V |
20+50	2.2125	0.30	|Q	|	|	|	V |
20+55	2.2143	0.26	|Q	|	|	|	V |
21+ 0	2.2159	0.24	Q	|	|	|	V |
21+ 5	2.2176	0.24	Q	|	|	|	V |
21+10	2.2194	0.27	|Q	|	|	|	V |
21+15	2.2214	0.29	|Q	|	|	|	V|
21+20	2.2234	0.29	|Q	|	|	|	V|
21+25	2.2251	0.25	|Q	|	|	|	V|
21+30	2.2267	0.23	Q	|	|	|	V|
21+35	2.2283	0.23	Q	|	|	|	V|
21+40	2.2301	0.26	|Q	|	|	|	V|
21+45	2.2321	0.29	|Q	|	|	|	V|
21+50	2.2340	0.28	|Q	|	|	|	V|
21+55	2.2358	0.25	|Q	|	|	|	V|
22+ 0	2.2374	0.23	Q	|	|	|	V|
22+ 5	2.2389	0.23	Q	|	|	|	V|
22+10	2.2408	0.26	|Q	|	|	|	V|
22+15	2.2427	0.29	|Q	|	|	|	V|
22+20	2.2447	0.28	|Q	|	|	|	V|
22+25	2.2464	0.25	|Q	|	|	|	V|
22+30	2.2480	0.23	Q	|	|	|	V|
22+35	2.2495	0.22	Q	|	|	|	V|
22+40	2.2510	0.22	Q	|	|	|	V|
22+45	2.2525	0.21	Q	|	|	|	V|
22+50	2.2540	0.21	Q	|	|	|	V|
22+55	2.2554	0.21	Q	|	|	|	V|
23+ 0	2.2568	0.21	Q	|	|	|	V|
23+ 5	2.2583	0.21	Q	|	|	|	V|
23+10	2.2597	0.21	Q	|	|	|	V|
23+15	2.2611	0.21	Q	|	|	|	V|
23+20	2.2626	0.21	Q	|	|	|	V|
23+25	2.2640	0.21	Q	|	|	|	V|
23+30	2.2654	0.21	Q	|	|	|	V|
23+35	2.2668	0.21	Q	|	|	|	V|
23+40	2.2682	0.21	Q	|	|	|	V|
23+45	2.2697	0.21	Q	|	|	|	V|
23+50	2.2711	0.21	Q	|	|	|	V|
23+55	2.2725	0.21	Q	|	|	|	V|
24+ 0	2.2739	0.21	Q	|	|	|	V|
24+ 5	2.2752	0.19	Q	|	|	|	V|
24+10	2.2760	0.11	Q	|	|	|	V|
24+15	2.2764	0.06	Q	|	|	|	V|
24+20	2.2767	0.04	Q	|	|	|	V|
24+25	2.2769	0.03	Q	|	|	|	V|
24+30	2.2771	0.02	Q	|	|	|	V|
24+35	2.2772	0.01	Q	|	|	|	V|
24+40	2.2772	0.01	Q	|	|	|	V|
24+45	2.2773	0.01	Q	|	|	|	V|
24+50	2.2773	0.00	Q	|	|	|	V|

```
   24+55       2.2773      0.00  Q         |         |         |        V|
   25+ 0       2.2773      0.00  Q         |         |         |        V|
-------------------------------------------------------------------------
```



Phase-II Future Developed Condition-Onsite

```
        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 - 2004, Version 7.0
                Study date  10/22/20 File: UH2DEV24100.out

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

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


Program License Serial Number 5028

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

 English Units used in output format



------------------------------------------------------------------------
RIVERSIDE TEMPLE PH-2
100YR 24 HR STORMEVENT
DEVELOPED CONDITION

------------------------------------------------------------------------
Drainage Area =       8.50(Ac.)  =      0.013 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       8.50(Ac.)  =      0.013 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.188 Hr.
Lag time =    11.28 Min.
25% of lag time =     2.82 Min.
40% of lag time =     4.51 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]
        8.50           2.20                 18.70

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        8.50           5.50                 46.75

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    2.200(In)
Area Averaged 100-Year Rainfall =    5.500(In)

Point rain (area averaged) =    5.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    5.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.500           56.00          0.170
 Total Area Entered =      8.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  74.8      0.305     0.170        0.259       1.000      0.259
                                                  Sum (F) =   0.259
```

Area averaged mean soil loss (F) (In/Hr) = 0.259
Minimum soil loss rate ((In/Hr)) = 0.129
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.765

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	44.326	5.092	0.436
2	0.167	88.652	21.377	1.831
3	0.250	132.979	28.456	2.438
4	0.333	177.305	15.339	1.314
5	0.417	221.631	7.510	0.643
6	0.500	265.957	5.069	0.434
7	0.583	310.284	3.773	0.323
8	0.667	354.610	2.827	0.242
9	0.750	398.936	2.235	0.191
10	0.833	443.262	1.697	0.145
11	0.917	487.589	1.387	0.119
12	1.000	531.915	1.239	0.106
13	1.083	576.241	0.958	0.082
14	1.167	620.567	0.794	0.068
15	1.250	664.894	0.636	0.054
16	1.333	709.220	0.482	0.041
17	1.417	753.546	0.443	0.038
18	1.500	797.872	0.443	0.038
19	1.583	842.199	0.243	0.021
		Sum = 100.000	Sum= 8.566

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.044	0.458	0.034	0.01
2	0.17	0.07	0.044	0.457	0.034	0.01
3	0.25	0.07	0.044	0.455	0.034	0.01
4	0.33	0.10	0.066	0.453	0.050	0.02
5	0.42	0.10	0.066	0.451	0.050	0.02
6	0.50	0.10	0.066	0.450	0.050	0.02
7	0.58	0.10	0.066	0.448	0.050	0.02
8	0.67	0.10	0.066	0.446	0.050	0.02
9	0.75	0.10	0.066	0.444	0.050	0.02
10	0.83	0.13	0.088	0.443	0.067	0.02
11	0.92	0.13	0.088	0.441	0.067	0.02
12	1.00	0.13	0.088	0.439	0.067	0.02
13	1.08	0.10	0.066	0.437	0.050	0.02
14	1.17	0.10	0.066	0.436	0.050	0.02
15	1.25	0.10	0.066	0.434	0.050	0.02
16	1.33	0.10	0.066	0.432	0.050	0.02
17	1.42	0.10	0.066	0.431	0.050	0.02
18	1.50	0.10	0.066	0.429	0.050	0.02
19	1.58	0.10	0.066	0.427	0.050	0.02
20	1.67	0.10	0.066	0.425	0.050	0.02
21	1.75	0.10	0.066	0.424	0.050	0.02
22	1.83	0.13	0.088	0.422	0.067	0.02
23	1.92	0.13	0.088	0.420	0.067	0.02
24	2.00	0.13	0.088	0.419	0.067	0.02
25	2.08	0.13	0.088	0.417	0.067	0.02
26	2.17	0.13	0.088	0.415	0.067	0.02
27	2.25	0.13	0.088	0.414	0.067	0.02
28	2.33	0.13	0.088	0.412	0.067	0.02
29	2.42	0.13	0.088	0.410	0.067	0.02
30	2.50	0.13	0.088	0.408	0.067	0.02
31	2.58	0.17	0.110	0.407	0.084	0.03
32	2.67	0.17	0.110	0.405	0.084	0.03

33	2.75	0.17	0.110	0.403	0.084	0.03
34	2.83	0.17	0.110	0.402	0.084	0.03
35	2.92	0.17	0.110	0.400	0.084	0.03
36	3.00	0.17	0.110	0.399	0.084	0.03
37	3.08	0.17	0.110	0.397	0.084	0.03
38	3.17	0.17	0.110	0.395	0.084	0.03
39	3.25	0.17	0.110	0.394	0.084	0.03
40	3.33	0.17	0.110	0.392	0.084	0.03
41	3.42	0.17	0.110	0.390	0.084	0.03
42	3.50	0.17	0.110	0.389	0.084	0.03
43	3.58	0.17	0.110	0.387	0.084	0.03
44	3.67	0.17	0.110	0.385	0.084	0.03
45	3.75	0.17	0.110	0.384	0.084	0.03
46	3.83	0.20	0.132	0.382	0.101	0.03
47	3.92	0.20	0.132	0.381	0.101	0.03
48	4.00	0.20	0.132	0.379	0.101	0.03
49	4.08	0.20	0.132	0.377	0.101	0.03
50	4.17	0.20	0.132	0.376	0.101	0.03
51	4.25	0.20	0.132	0.374	0.101	0.03
52	4.33	0.23	0.154	0.373	0.118	0.04
53	4.42	0.23	0.154	0.371	0.118	0.04
54	4.50	0.23	0.154	0.369	0.118	0.04
55	4.58	0.23	0.154	0.368	0.118	0.04
56	4.67	0.23	0.154	0.366	0.118	0.04
57	4.75	0.23	0.154	0.365	0.118	0.04
58	4.83	0.27	0.176	0.363	0.135	0.04
59	4.92	0.27	0.176	0.361	0.135	0.04
60	5.00	0.27	0.176	0.360	0.135	0.04
61	5.08	0.20	0.132	0.358	0.101	0.03
62	5.17	0.20	0.132	0.357	0.101	0.03
63	5.25	0.20	0.132	0.355	0.101	0.03
64	5.33	0.23	0.154	0.354	0.118	0.04
65	5.42	0.23	0.154	0.352	0.118	0.04
66	5.50	0.23	0.154	0.351	0.118	0.04
67	5.58	0.27	0.176	0.349	0.135	0.04
68	5.67	0.27	0.176	0.348	0.135	0.04
69	5.75	0.27	0.176	0.346	0.135	0.04
70	5.83	0.27	0.176	0.344	0.135	0.04
71	5.92	0.27	0.176	0.343	0.135	0.04
72	6.00	0.27	0.176	0.341	0.135	0.04
73	6.08	0.30	0.198	0.340	0.151	0.05
74	6.17	0.30	0.198	0.338	0.151	0.05
75	6.25	0.30	0.198	0.337	0.151	0.05
76	6.33	0.30	0.198	0.335	0.151	0.05
77	6.42	0.30	0.198	0.334	0.151	0.05
78	6.50	0.30	0.198	0.332	0.151	0.05
79	6.58	0.33	0.220	0.331	0.168	0.05
80	6.67	0.33	0.220	0.329	0.168	0.05
81	6.75	0.33	0.220	0.328	0.168	0.05
82	6.83	0.33	0.220	0.326	0.168	0.05
83	6.92	0.33	0.220	0.325	0.168	0.05
84	7.00	0.33	0.220	0.323	0.168	0.05
85	7.08	0.33	0.220	0.322	0.168	0.05
86	7.17	0.33	0.220	0.321	0.168	0.05
87	7.25	0.33	0.220	0.319	0.168	0.05
88	7.33	0.37	0.242	0.318	0.185	0.06
89	7.42	0.37	0.242	0.316	0.185	0.06
90	7.50	0.37	0.242	0.315	0.185	0.06
91	7.58	0.40	0.264	0.313	0.202	0.06
92	7.67	0.40	0.264	0.312	0.202	0.06
93	7.75	0.40	0.264	0.310	0.202	0.06
94	7.83	0.43	0.286	0.309	0.219	0.07
95	7.92	0.43	0.286	0.308	0.219	0.07
96	8.00	0.43	0.286	0.306	0.219	0.07
97	8.08	0.50	0.330	0.305	---	0.03
98	8.17	0.50	0.330	0.303	---	0.03
99	8.25	0.50	0.330	0.302	---	0.03
100	8.33	0.50	0.330	0.300	---	0.03
101	8.42	0.50	0.330	0.299	---	0.03
102	8.50	0.50	0.330	0.298	---	0.03
103	8.58	0.53	0.352	0.296	---	0.06

104	8.67	0.53	0.352	0.295	---	0.06
105	8.75	0.53	0.352	0.293	---	0.06
106	8.83	0.57	0.374	0.292	---	0.08
107	8.92	0.57	0.374	0.291	---	0.08
108	9.00	0.57	0.374	0.289	---	0.08
109	9.08	0.63	0.418	0.288	---	0.13
110	9.17	0.63	0.418	0.287	---	0.13
111	9.25	0.63	0.418	0.285	---	0.13
112	9.33	0.67	0.440	0.284	---	0.16
113	9.42	0.67	0.440	0.282	---	0.16
114	9.50	0.67	0.440	0.281	---	0.16
115	9.58	0.70	0.462	0.280	---	0.18
116	9.67	0.70	0.462	0.278	---	0.18
117	9.75	0.70	0.462	0.277	---	0.18
118	9.83	0.73	0.484	0.276	---	0.21
119	9.92	0.73	0.484	0.274	---	0.21
120	10.00	0.73	0.484	0.273	---	0.21
121	10.08	0.50	0.330	0.272	---	0.06
122	10.17	0.50	0.330	0.270	---	0.06
123	10.25	0.50	0.330	0.269	---	0.06
124	10.33	0.50	0.330	0.268	---	0.06
125	10.42	0.50	0.330	0.267	---	0.06
126	10.50	0.50	0.330	0.265	---	0.06
127	10.58	0.67	0.440	0.264	---	0.18
128	10.67	0.67	0.440	0.263	---	0.18
129	10.75	0.67	0.440	0.261	---	0.18
130	10.83	0.67	0.440	0.260	---	0.18
131	10.92	0.67	0.440	0.259	---	0.18
132	11.00	0.67	0.440	0.258	---	0.18
133	11.08	0.63	0.418	0.256	---	0.16
134	11.17	0.63	0.418	0.255	---	0.16
135	11.25	0.63	0.418	0.254	---	0.16
136	11.33	0.63	0.418	0.253	---	0.17
137	11.42	0.63	0.418	0.251	---	0.17
138	11.50	0.63	0.418	0.250	---	0.17
139	11.58	0.57	0.374	0.249	---	0.13
140	11.67	0.57	0.374	0.248	---	0.13
141	11.75	0.57	0.374	0.246	---	0.13
142	11.83	0.60	0.396	0.245	---	0.15
143	11.92	0.60	0.396	0.244	---	0.15
144	12.00	0.60	0.396	0.243	---	0.15
145	12.08	0.83	0.550	0.241	---	0.31
146	12.17	0.83	0.550	0.240	---	0.31
147	12.25	0.83	0.550	0.239	---	0.31
148	12.33	0.87	0.572	0.238	---	0.33
149	12.42	0.87	0.572	0.237	---	0.34
150	12.50	0.87	0.572	0.235	---	0.34
151	12.58	0.93	0.616	0.234	---	0.38
152	12.67	0.93	0.616	0.233	---	0.38
153	12.75	0.93	0.616	0.232	---	0.38
154	12.83	0.97	0.638	0.231	---	0.41
155	12.92	0.97	0.638	0.230	---	0.41
156	13.00	0.97	0.638	0.228	---	0.41
157	13.08	1.13	0.748	0.227	---	0.52
158	13.17	1.13	0.748	0.226	---	0.52
159	13.25	1.13	0.748	0.225	---	0.52
160	13.33	1.13	0.748	0.224	---	0.52
161	13.42	1.13	0.748	0.223	---	0.53
162	13.50	1.13	0.748	0.222	---	0.53
163	13.58	0.77	0.506	0.220	---	0.29
164	13.67	0.77	0.506	0.219	---	0.29
165	13.75	0.77	0.506	0.218	---	0.29
166	13.83	0.77	0.506	0.217	---	0.29
167	13.92	0.77	0.506	0.216	---	0.29
168	14.00	0.77	0.506	0.215	---	0.29
169	14.08	0.90	0.594	0.214	---	0.38
170	14.17	0.90	0.594	0.213	---	0.38
171	14.25	0.90	0.594	0.212	---	0.38
172	14.33	0.87	0.572	0.210	---	0.36
173	14.42	0.87	0.572	0.209	---	0.36
174	14.50	0.87	0.572	0.208	---	0.36

175	14.58	0.87	0.572	0.207	---	0.36
176	14.67	0.87	0.572	0.206	---	0.37
177	14.75	0.87	0.572	0.205	---	0.37
178	14.83	0.83	0.550	0.204	---	0.35
179	14.92	0.83	0.550	0.203	---	0.35
180	15.00	0.83	0.550	0.202	---	0.35
181	15.08	0.80	0.528	0.201	---	0.33
182	15.17	0.80	0.528	0.200	---	0.33
183	15.25	0.80	0.528	0.199	---	0.33
184	15.33	0.77	0.506	0.198	---	0.31
185	15.42	0.77	0.506	0.197	---	0.31
186	15.50	0.77	0.506	0.196	---	0.31
187	15.58	0.63	0.418	0.195	---	0.22
188	15.67	0.63	0.418	0.194	---	0.22
189	15.75	0.63	0.418	0.193	---	0.23
190	15.83	0.63	0.418	0.192	---	0.23
191	15.92	0.63	0.418	0.191	---	0.23
192	16.00	0.63	0.418	0.190	---	0.23
193	16.08	0.13	0.088	0.189	0.067	0.02
194	16.17	0.13	0.088	0.188	0.067	0.02
195	16.25	0.13	0.088	0.187	0.067	0.02
196	16.33	0.13	0.088	0.186	0.067	0.02
197	16.42	0.13	0.088	0.185	0.067	0.02
198	16.50	0.13	0.088	0.184	0.067	0.02
199	16.58	0.10	0.066	0.183	0.050	0.02
200	16.67	0.10	0.066	0.182	0.050	0.02
201	16.75	0.10	0.066	0.181	0.050	0.02
202	16.83	0.10	0.066	0.180	0.050	0.02
203	16.92	0.10	0.066	0.180	0.050	0.02
204	17.00	0.10	0.066	0.179	0.050	0.02
205	17.08	0.17	0.110	0.178	0.084	0.03
206	17.17	0.17	0.110	0.177	0.084	0.03
207	17.25	0.17	0.110	0.176	0.084	0.03
208	17.33	0.17	0.110	0.175	0.084	0.03
209	17.42	0.17	0.110	0.174	0.084	0.03
210	17.50	0.17	0.110	0.173	0.084	0.03
211	17.58	0.17	0.110	0.172	0.084	0.03
212	17.67	0.17	0.110	0.172	0.084	0.03
213	17.75	0.17	0.110	0.171	0.084	0.03
214	17.83	0.13	0.088	0.170	0.067	0.02
215	17.92	0.13	0.088	0.169	0.067	0.02
216	18.00	0.13	0.088	0.168	0.067	0.02
217	18.08	0.13	0.088	0.167	0.067	0.02
218	18.17	0.13	0.088	0.167	0.067	0.02
219	18.25	0.13	0.088	0.166	0.067	0.02
220	18.33	0.13	0.088	0.165	0.067	0.02
221	18.42	0.13	0.088	0.164	0.067	0.02
222	18.50	0.13	0.088	0.163	0.067	0.02
223	18.58	0.10	0.066	0.163	0.050	0.02
224	18.67	0.10	0.066	0.162	0.050	0.02
225	18.75	0.10	0.066	0.161	0.050	0.02
226	18.83	0.07	0.044	0.160	0.034	0.01
227	18.92	0.07	0.044	0.159	0.034	0.01
228	19.00	0.07	0.044	0.159	0.034	0.01
229	19.08	0.10	0.066	0.158	0.050	0.02
230	19.17	0.10	0.066	0.157	0.050	0.02
231	19.25	0.10	0.066	0.156	0.050	0.02
232	19.33	0.13	0.088	0.156	0.067	0.02
233	19.42	0.13	0.088	0.155	0.067	0.02
234	19.50	0.13	0.088	0.154	0.067	0.02
235	19.58	0.10	0.066	0.154	0.050	0.02
236	19.67	0.10	0.066	0.153	0.050	0.02
237	19.75	0.10	0.066	0.152	0.050	0.02
238	19.83	0.07	0.044	0.152	0.034	0.01
239	19.92	0.07	0.044	0.151	0.034	0.01
240	20.00	0.07	0.044	0.150	0.034	0.01
241	20.08	0.10	0.066	0.150	0.050	0.02
242	20.17	0.10	0.066	0.149	0.050	0.02
243	20.25	0.10	0.066	0.148	0.050	0.02
244	20.33	0.10	0.066	0.148	0.050	0.02
245	20.42	0.10	0.066	0.147	0.050	0.02

246	20.50	0.10	0.066	0.146	0.050	0.02
247	20.58	0.10	0.066	0.146	0.050	0.02
248	20.67	0.10	0.066	0.145	0.050	0.02
249	20.75	0.10	0.066	0.144	0.050	0.02
250	20.83	0.07	0.044	0.144	0.034	0.01
251	20.92	0.07	0.044	0.143	0.034	0.01
252	21.00	0.07	0.044	0.143	0.034	0.01
253	21.08	0.10	0.066	0.142	0.050	0.02
254	21.17	0.10	0.066	0.142	0.050	0.02
255	21.25	0.10	0.066	0.141	0.050	0.02
256	21.33	0.07	0.044	0.141	0.034	0.01
257	21.42	0.07	0.044	0.140	0.034	0.01
258	21.50	0.07	0.044	0.139	0.034	0.01
259	21.58	0.10	0.066	0.139	0.050	0.02
260	21.67	0.10	0.066	0.138	0.050	0.02
261	21.75	0.10	0.066	0.138	0.050	0.02
262	21.83	0.07	0.044	0.137	0.034	0.01
263	21.92	0.07	0.044	0.137	0.034	0.01
264	22.00	0.07	0.044	0.137	0.034	0.01
265	22.08	0.10	0.066	0.136	0.050	0.02
266	22.17	0.10	0.066	0.136	0.050	0.02
267	22.25	0.10	0.066	0.135	0.050	0.02
268	22.33	0.07	0.044	0.135	0.034	0.01
269	22.42	0.07	0.044	0.134	0.034	0.01
270	22.50	0.07	0.044	0.134	0.034	0.01
271	22.58	0.07	0.044	0.134	0.034	0.01
272	22.67	0.07	0.044	0.133	0.034	0.01
273	22.75	0.07	0.044	0.133	0.034	0.01
274	22.83	0.07	0.044	0.133	0.034	0.01
275	22.92	0.07	0.044	0.132	0.034	0.01
276	23.00	0.07	0.044	0.132	0.034	0.01
277	23.08	0.07	0.044	0.132	0.034	0.01
278	23.17	0.07	0.044	0.131	0.034	0.01
279	23.25	0.07	0.044	0.131	0.034	0.01
280	23.33	0.07	0.044	0.131	0.034	0.01
281	23.42	0.07	0.044	0.130	0.034	0.01
282	23.50	0.07	0.044	0.130	0.034	0.01
283	23.58	0.07	0.044	0.130	0.034	0.01
284	23.67	0.07	0.044	0.130	0.034	0.01
285	23.75	0.07	0.044	0.130	0.034	0.01
286	23.83	0.07	0.044	0.130	0.034	0.01
287	23.92	0.07	0.044	0.129	0.034	0.01
288	24.00	0.07	0.044	0.129	0.034	0.01
Sum =		100.0			Sum =	27.4

Flood volume = Effective rainfall 2.28(In)
times area 8.5(Ac.)/[(In)/(Ft.)] = 1.6(Ac.Ft)
Total soil loss = 3.22(In)
Total soil loss = 2.279(Ac.Ft)
Total rainfall = 5.50(In)
Flood volume = 70437.7 Cubic Feet
Total soil loss = 99262.0 Cubic Feet

Peak flow rate of this hydrograph = 4.280(CFS)

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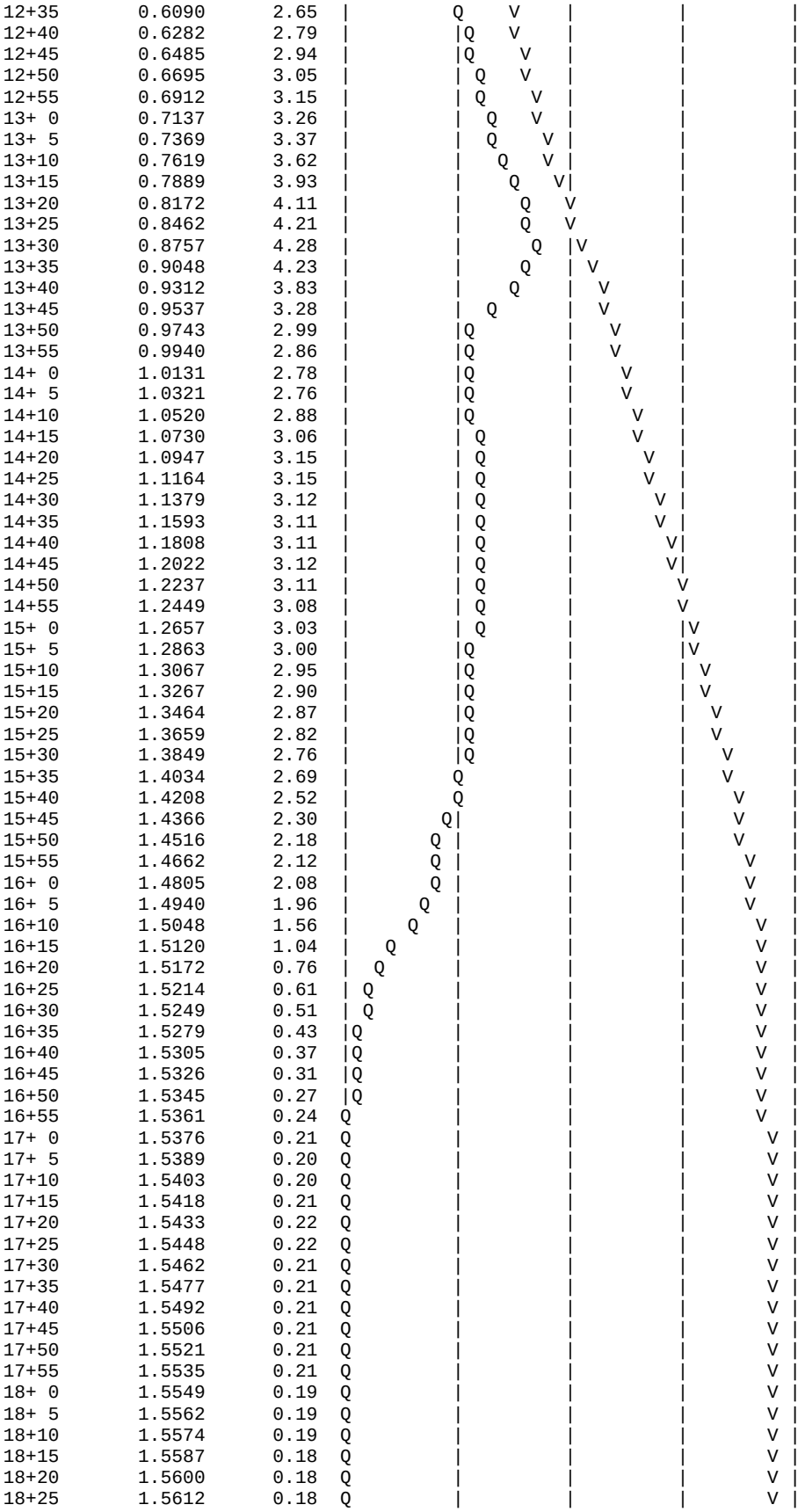
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0002	0.02	Q	|	|	|	|
0+15	0.0005	0.05	Q	|	|	|	|
0+20	0.0010	0.06	Q	|	|	|	|
0+25	0.0015	0.08	Q	|	|	|	|
0+30	0.0022	0.10	Q	|	|	|	|
0+35	0.0029	0.11	Q	|	|	|	|
0+40	0.0037	0.11	Q	|	|	|	|

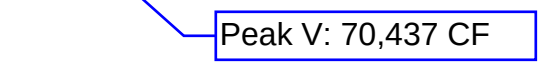
0+45	0.0045	0.12	Q	|	|	|	|
0+50	0.0054	0.12	Q	|	|	|	|
0+55	0.0063	0.14	Q	|	|	|	|
1+ 0	0.0074	0.15	Q	|	|	|	|
1+ 5	0.0084	0.16	Q	|	|	|	|
1+10	0.0095	0.15	Q	|	|	|	|
1+15	0.0105	0.14	Q	|	|	|	|
1+20	0.0114	0.14	Q	|	|	|	|
1+25	0.0123	0.14	Q	|	|	|	|
1+30	0.0133	0.14	Q	|	|	|	|
1+35	0.0142	0.14	Q	|	|	|	|
1+40	0.0151	0.13	Q	|	|	|	|
1+45	0.0161	0.13	Q	|	|	|	|
1+50	0.0170	0.14	Q	|	|	|	|
1+55	0.0180	0.15	Q	|	|	|	|
2+ 0	0.0191	0.16	Q	|	|	|	|
2+ 5	0.0202	0.16	Q	|	|	|	|
2+10	0.0214	0.17	Q	|	|	|	|
2+15	0.0226	0.17	Q	|	|	|	|
2+20	0.0238	0.17	Q	|	|	|	|
2+25	0.0249	0.17	Q	|	|	|	|
2+30	0.0261	0.17	Q	|	|	|	|
2+35	0.0274	0.18	Q	|	|	|	|
2+40	0.0286	0.19	Q	|	|	|	|
2+45	0.0300	0.20	Q	|	|	|	|
2+50	0.0314	0.21	Q	|	|	|	|
2+55	0.0329	0.21	Q	|	|	|	|
3+ 0	0.0344	0.21	Q	|	|	|	|
3+ 5	0.0358	0.22	Q	|	|	|	|
3+10	0.0373	0.22	Q	|	|	|	|
3+15	0.0388	0.22	Q	|	|	|	|
3+20	0.0403	0.22	Q	|	|	|	|
3+25	0.0419	0.22	QV	|	|	|	|
3+30	0.0434	0.22	QV	|	|	|	|
3+35	0.0449	0.22	QV	|	|	|	|
3+40	0.0464	0.22	QV	|	|	|	|
3+45	0.0479	0.22	QV	|	|	|	|
3+50	0.0495	0.22	QV	|	|	|	|
3+55	0.0511	0.23	QV	|	|	|	|
4+ 0	0.0528	0.25	QV	|	|	|	|
4+ 5	0.0545	0.25	|Q	|	|	|	|
4+10	0.0563	0.26	|Q	|	|	|	|
4+15	0.0580	0.26	|Q	|	|	|	|
4+20	0.0598	0.26	|Q	|	|	|	|
4+25	0.0617	0.27	|Q	|	|	|	|
4+30	0.0637	0.29	|Q	|	|	|	|
4+35	0.0657	0.29	|Q	|	|	|	|
4+40	0.0678	0.30	|Q	|	|	|	|
4+45	0.0698	0.30	|Q	|	|	|	|
4+50	0.0719	0.31	|Q	|	|	|	|
4+55	0.0741	0.32	|Q	|	|	|	|
5+ 0	0.0764	0.33	|Q	|	|	|	|
5+ 5	0.0787	0.33	|Q	|	|	|	|
5+10	0.0809	0.32	|QV	|	|	|	|
5+15	0.0829	0.30	|QV	|	|	|	|
5+20	0.0849	0.29	|QV	|	|	|	|
5+25	0.0869	0.29	|QV	|	|	|	|
5+30	0.0890	0.30	|QV	|	|	|	|
5+35	0.0911	0.31	|QV	|	|	|	|
5+40	0.0933	0.32	|QV	|	|	|	|
5+45	0.0956	0.33	|QV	|	|	|	|
5+50	0.0979	0.34	|QV	|	|	|	|
5+55	0.1003	0.34	|QV	|	|	|	|
6+ 0	0.1027	0.35	|QV	|	|	|	|
6+ 5	0.1051	0.35	|QV	|	|	|	|
6+10	0.1076	0.36	|QV	|	|	|	|
6+15	0.1102	0.37	|QV	|	|	|	|
6+20	0.1128	0.38	|QV	|	|	|	|
6+25	0.1155	0.39	|QV	|	|	|	|
6+30	0.1181	0.39	|QV	|	|	|	|
6+35	0.1208	0.39	|QV	|	|	|	|

6+40	0.1236	0.40	Q V			
6+45	0.1265	0.42	Q V			
6+50	0.1294	0.43	Q V			
6+55	0.1324	0.43	Q V			
7+ 0	0.1354	0.43	Q V			
7+ 5	0.1384	0.44	Q V			
7+10	0.1414	0.44	Q V			
7+15	0.1444	0.44	Q V			
7+20	0.1475	0.44	Q V			
7+25	0.1506	0.45	Q V			
7+30	0.1538	0.47	Q V			
7+35	0.1571	0.48	Q V			
7+40	0.1604	0.49	Q V			
7+45	0.1639	0.50	Q V			
7+50	0.1674	0.51	Q V			
7+55	0.1711	0.53	Q V			
8+ 0	0.1748	0.54	Q V			
8+ 5	0.1785	0.54	Q V			
8+10	0.1817	0.46	Q V			
8+15	0.1843	0.37	Q V			
8+20	0.1865	0.32	Q V			
8+25	0.1886	0.31	Q V			
8+30	0.1907	0.30	Q V			
8+35	0.1928	0.31	Q V			
8+40	0.1952	0.35	Q V			
8+45	0.1980	0.41	Q V			
8+50	0.2011	0.45	Q V			
8+55	0.2047	0.51	Q V			
9+ 0	0.2087	0.58	Q V			
9+ 5	0.2131	0.65	Q V			
9+10	0.2184	0.76	Q V			
9+15	0.2245	0.89	Q V			
9+20	0.2312	0.97	Q V			
9+25	0.2385	1.06	QV			
9+30	0.2464	1.15	Q V			
9+35	0.2548	1.22	Q V			
9+40	0.2637	1.30	QV			
9+45	0.2733	1.39	QV			
9+50	0.2833	1.45	Q V			
9+55	0.2938	1.53	QV			
10+ 0	0.3050	1.62	QV			
10+ 5	0.3160	1.61	QV			
10+10	0.3254	1.36	Q V			
10+15	0.3324	1.02	Q V			
10+20	0.3381	0.84	Q V			
10+25	0.3434	0.76	Q V			
10+30	0.3483	0.72	Q V			
10+35	0.3534	0.73	Q V			
10+40	0.3597	0.91	Q V			
10+45	0.3677	1.17	Q V			
10+50	0.3767	1.30	Q V			
10+55	0.3861	1.37	Q V			
11+ 0	0.3958	1.41	Q V			
11+ 5	0.4057	1.44	Q V			
11+10	0.4156	1.43	Q V			
11+15	0.4252	1.40	Q V			
11+20	0.4348	1.39	Q V			
11+25	0.4444	1.39	Q V			
11+30	0.4540	1.40	Q V			
11+35	0.4636	1.39	Q V			
11+40	0.4727	1.32	Q V			
11+45	0.4812	1.23	Q V			
11+50	0.4894	1.19	Q V			
11+55	0.4978	1.22	Q V			
12+ 0	0.5065	1.26	Q V			
12+ 5	0.5158	1.36	Q V			
12+10	0.5272	1.65	Q V			
12+15	0.5412	2.04	Q V			
12+20	0.5568	2.26	Q V			
12+25	0.5734	2.41	Q V			
12+30	0.5908	2.54	Q V			



18+30	1.5625	0.18	Q	|	|	|	V |
18+35	1.5637	0.18	Q	|	|	|	V |
18+40	1.5648	0.17	Q	|	|	|	V |
18+45	1.5659	0.15	Q	|	|	|	V |
18+50	1.5669	0.15	Q	|	|	|	V |
18+55	1.5678	0.13	Q	|	|	|	V |
19+ 0	1.5686	0.12	Q	|	|	|	V |
19+ 5	1.5694	0.11	Q	|	|	|	V |
19+10	1.5702	0.12	Q	|	|	|	V |
19+15	1.5710	0.12	Q	|	|	|	V |
19+20	1.5719	0.13	Q	|	|	|	V |
19+25	1.5729	0.14	Q	|	|	|	V |
19+30	1.5740	0.16	Q	|	|	|	V |
19+35	1.5751	0.16	Q	|	|	|	V |
19+40	1.5761	0.15	Q	|	|	|	V |
19+45	1.5771	0.14	Q	|	|	|	V|
19+50	1.5781	0.14	Q	|	|	|	V|
19+55	1.5789	0.13	Q	|	|	|	V|
20+ 0	1.5797	0.11	Q	|	|	|	V|
20+ 5	1.5804	0.11	Q	|	|	|	V|
20+10	1.5812	0.11	Q	|	|	|	V|
20+15	1.5820	0.12	Q	|	|	|	V|
20+20	1.5829	0.13	Q	|	|	|	V|
20+25	1.5838	0.13	Q	|	|	|	V|
20+30	1.5847	0.13	Q	|	|	|	V|
20+35	1.5856	0.13	Q	|	|	|	V|
20+40	1.5865	0.13	Q	|	|	|	V|
20+45	1.5874	0.13	Q	|	|	|	V|
20+50	1.5883	0.13	Q	|	|	|	V|
20+55	1.5891	0.12	Q	|	|	|	V|
21+ 0	1.5899	0.11	Q	|	|	|	V|
21+ 5	1.5906	0.10	Q	|	|	|	V|
21+10	1.5913	0.11	Q	|	|	|	V|
21+15	1.5922	0.12	Q	|	|	|	V|
21+20	1.5930	0.12	Q	|	|	|	V|
21+25	1.5938	0.12	Q	|	|	|	V|
21+30	1.5945	0.10	Q	|	|	|	V|
21+35	1.5952	0.10	Q	|	|	|	V|
21+40	1.5960	0.11	Q	|	|	|	V|
21+45	1.5968	0.12	Q	|	|	|	V|
21+50	1.5976	0.12	Q	|	|	|	V|
21+55	1.5984	0.11	Q	|	|	|	V|
22+ 0	1.5991	0.10	Q	|	|	|	V|
22+ 5	1.5998	0.10	Q	|	|	|	V|
22+10	1.6006	0.11	Q	|	|	|	V|
22+15	1.6014	0.12	Q	|	|	|	V|
22+20	1.6022	0.12	Q	|	|	|	V|
22+25	1.6030	0.11	Q	|	|	|	V|
22+30	1.6037	0.10	Q	|	|	|	V|
22+35	1.6044	0.10	Q	|	|	|	V|
22+40	1.6050	0.10	Q	|	|	|	V|
22+45	1.6057	0.09	Q	|	|	|	V|
22+50	1.6063	0.09	Q	|	|	|	V|
22+55	1.6069	0.09	Q	|	|	|	V|
23+ 0	1.6076	0.09	Q	|	|	|	V|
23+ 5	1.6082	0.09	Q	|	|	|	V|
23+10	1.6088	0.09	Q	|	|	|	V|
23+15	1.6094	0.09	Q	|	|	|	V|
23+20	1.6101	0.09	Q	|	|	|	V|
23+25	1.6107	0.09	Q	|	|	|	V|
23+30	1.6113	0.09	Q	|	|	|	V|
23+35	1.6119	0.09	Q	|	|	|	V|
23+40	1.6125	0.09	Q	|	|	|	V|
23+45	1.6131	0.09	Q	|	|	|	V|
23+50	1.6137	0.09	Q	|	|	|	V|
23+55	1.6143	0.09	Q	|	|	|	V|
24+ 0	1.6150	0.09	Q	|	|	|	V|
24+ 5	1.6155	0.08	Q	|	|	|	V|
24+10	1.6160	0.07	Q	|	|	|	V|
24+15	1.6163	0.04	Q	|	|	|	V|
24+20	1.6164	0.03	Q	|	|	|	V|

```
   24+25       1.6166      0.02  Q         |         |         |         V|
   24+30       1.6167      0.02  Q         |         |         |         V|
   24+35       1.6168      0.01  Q         |         |         |         V|
   24+40       1.6168      0.01  Q         |         |         |         V|
   24+45       1.6169      0.01  Q         |         |         |         V|
   24+50       1.6169      0.01  Q         |         |         |         V|
   24+55       1.6169      0.00  Q         |         |         |         V|
   25+ 0       1.6170      0.00  Q         |         |         |         V|
   25+ 5       1.6170      0.00  Q         |         |         |         V|
   25+10       1.6170      0.00  Q         |         |         |         V|
   25+15       1.6170      0.00  Q         |         |         |         V|
   25+20       1.6170      0.00  Q         |         |         |         V|
   25+25       1.6170      0.00  Q         |         |         |         V|
   25+30       1.6170      0.00  Q         |         |         |          V
-------------------------------------------------------------------------
```

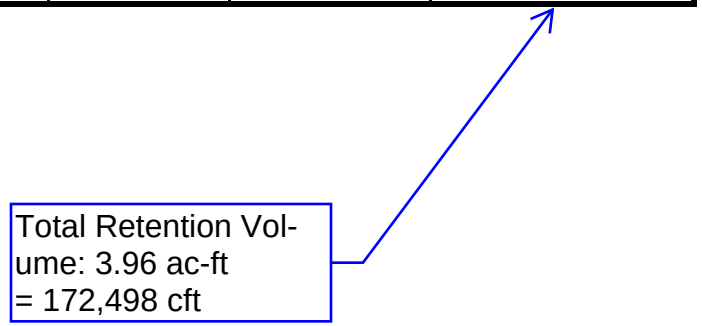


Combined runoff generation from PH-I & II (Onsite) : 3.8943 ac-ft = 172,833 CF

Retention Basin Calculation

Retention Basin Volume Table

Total Depth	Elevation	Elevation Area (sf)	Average Area (sf)	Depth (ft)	Volume (cf)	Volume (ac-ft)	Total Volume (ac-ft)
Retention							
0.0	1662.0	15,878					**0.00**
			17,007	1.0	17,007	0.39	
1.0	1663.0	18,136					**0.39**
			19,332	1.0	19,332	0.44	
2.0	1664.0	20,527					**0.83**
			21,787	1.0	21,787	0.50	
3.0	5.0	23,046					**1.33**
			24,374	1.0	24,374	0.56	
4.0	1666.0	25,701					**1.89**
			27,094	1.0	27,094	0.62	
5.0	1667.0	28,487					**2.52**
			29,947	1.0	29,947	0.69	
6.0	1668.0	31,407					**3.20**
			32,927	1.0	32,927	0.76	
7.0	1669.0	34,447					**3.96**



Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID: RET-1	Legend:	Required Entries / Calculated Cells

Company Name: ALLARD ENG — Date: 10/15/2020

Designed by: ADAM — County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =	16	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP} =	169,636	ft^3

Maximum Depth

a) Infiltration rate	I =	2.36	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	2	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	7.1	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		30	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		20	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	14.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	7.1	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	4	:1
b) Proposed basin depth (excluding freeboard)	d_B =	7	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	24234	ft^2
d) Proposed Design Surface Area	A_D =	24800	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	848	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	1	ft
c) Forebay surface area (minimum)	Area =	848	ft^2
d) Full height notch-type weir	Width (W) =	6.0	in

Notes:

Infiltration Drawdown Time For Retention Volume:

Infiltration Surface Area Provided:	24,800	SF	Surface Area at halfway depth of 5'
Infiltration Rate per Soil Report	2.36	in/hr	(Average of -tested pits (TP-5,6)
	0.20	ft/hr	
Facor of Safety	2		
Design Infiltration Rate	0.098	ft/hr	
Volume needed to be Infiltrated	169,636	cu.ft	
Infiltration Volume per hour	2438.67	cu.ft/hr	(24,800 sft * 0.098 ft/hr)
Infiltration Draw Down Time	69.56	Hours	(169,636 cu.ft / 2438.67 cu.ft/hr)
	70	< 72 hr draw down time. OK	

DRAINAGE CALCULATION
OFFSITE AREA TRIBUTARY TO SITE
(PHASE I & II)

OFFSITE AREA TRIBUTARY TO PHASE I

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
         RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                        (RCFC&WCD)  1978 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                        (Rational Tabling Version 23.0)
                   Release Date: 07/01/2016  License ID 1400

                            Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* PH1, OFFSITE ONLY                                                      *
* 100-YR STORM                                                           *
*                                                                        *
 ************************************************************************

  FILE NAME: OFF1.DAT
  TIME/DATE OF STUDY: 12:43 12/07/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.700
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.680
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.000
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5513834
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5501947
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.000
  SLOPE OF INTENSITY DURATION CURVE = 0.5502
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   735.00
  UPSTREAM ELEVATION(FEET) =   1900.00
  DOWNSTREAM ELEVATION(FEET) =   1700.00
  ELEVATION DIFFERENCE(FEET) =    200.00
  TC = 0.533*[(  735.00**3)/(   200.00)]**.2 =    9.682
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.728
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6503
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =      6.21
```

```
  TOTAL AREA(ACRES) =      3.50   TOTAL RUNOFF(CFS) =      6.21

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      4.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1700.00  DOWNSTREAM(FEET) =   1689.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   200.00   CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.671
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6465
  SOIL CLASSIFICATION IS "B"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.80
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   0.38
  Tc(MIN.) =   10.06
  SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.02
  TOTAL AREA(ACRES) =        3.5         PEAK FLOW RATE(CFS) =       6.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   8.81
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      4.00 =     935.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   615.00
  UPSTREAM ELEVATION(FEET) =   1890.00
  DOWNSTREAM ELEVATION(FEET) =   1711.00
  ELEVATION DIFFERENCE(FEET) =    179.00
  TC = 0.533*[(  615.00**3)/(   179.00)]**.2 =    8.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.858
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6586
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     16.57
  TOTAL AREA(ACRES) =      8.80   TOTAL RUNOFF(CFS) =     16.57

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1711.00  DOWNSTREAM(FEET) =   1689.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.0383
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      16.57
  FLOW VELOCITY(FEET/SEC.) =   9.75   FLOW DEPTH(FEET) =   0.75
  TRAVEL TIME(MIN.) =   0.98   Tc(MIN.) =    9.88
  LONGEST FLOWPATH FROM NODE      2.00 TO NODE      4.00 =    1190.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

```
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       16.57     9.88       2.698        8.80
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE      4.00 =    1190.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        6.23    10.06       2.671        3.51
 LONGEST FLOWPATH FROM NODE      0.00 TO NODE      4.00 =     935.00 FEET.

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

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      22.68       9.88        2.698
     2      22.63      10.06        2.671

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      22.68   Tc(MIN.) =    9.88
 TOTAL AREA(ACRES) =       12.3

****************************************************************************
 FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1689.00  DOWNSTREAM(FEET) =   1673.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00   CHANNEL SLOPE =  0.0615
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
 CHANNEL FLOW THRU SUBAREA(CFS) =      22.68
 FLOW VELOCITY(FEET/SEC.) =  12.58   FLOW DEPTH(FEET) =   0.78
 TRAVEL TIME(MIN.) =   0.34   Tc(MIN.) =   10.22
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE      5.00 =    1450.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       12.3  TC(MIN.) =     10.22
 PEAK FLOW RATE(CFS)   =      22.68
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

OFFSITE AREA TRIBUTARY TO PHASE 2

```
****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
         RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                        (RCFC&WCD)  1978 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                        (Rational Tabling Version 23.0)
                   Release Date: 07/01/2016  License ID 1400

                           Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* PH1, OFFSITE ONLY                                                      *
* 100-YR STORM                                                           *
*                                                                        *
 ************************************************************************

  FILE NAME: OFF1.DAT
  TIME/DATE OF STUDY: 13:27 12/07/2020
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  36.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.700
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.680
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.000
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5513834
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5501947
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.000
  SLOPE OF INTENSITY DURATION CURVE = 0.5502
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   690.00
  UPSTREAM ELEVATION(FEET) =   1880.00
  DOWNSTREAM ELEVATION(FEET) =   1680.00
  ELEVATION DIFFERENCE(FEET) =    200.00
  TC = 0.533*[(  690.00**3)/(   200.00)]**.2 =    9.322
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.786
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6540
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     12.94
```

```
  TOTAL AREA(ACRES) =      7.10   TOTAL RUNOFF(CFS) =     12.94

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1680.00  DOWNSTREAM(FEET) =   1670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0303
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.94
  FLOW VELOCITY(FEET/SEC.) =   8.45   FLOW DEPTH(FEET) =   0.71
  TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =    9.97
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1020.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1670.00  DOWNSTREAM(FEET) =   1667.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   343.00   CHANNEL SLOPE =  0.0087
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.94
  FLOW VELOCITY(FEET/SEC.) =   5.26   FLOW DEPTH(FEET) =   0.91
  TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   11.06
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      3.00 =    1363.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.1  TC(MIN.) =     11.06
  PEAK FLOW RATE(CFS)   =      12.94
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HYDRAULIC CALCULATION (36" SD SIZING)

```
******************************************************************************
                HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
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             Ver. 13.0  Release Date: 06/01/2006  License ID 1400

                          Analysis prepared by:



------------------------------------------------------------------------------
  TIME/DATE OF STUDY: 15:58 09/21/2020
==============================================================================
 Problem Descriptions:
  OUTLET PIPE SIZING CALC-36" RCP
  100-YR STORM EVENT

******************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
------------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   3.000
    PIPE SLOPE(FEET/FEET) =  0.0180
    PIPEFLOW(CFS) =        45.00
    MANNINGS FRICTION FACTOR = 0.013000
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      2.19
    CRITICAL FLOW AREA(SQUARE FEET) =     5.516
    CRITICAL FLOW TOP-WIDTH(FEET) =   2.669
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         1046.57
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     8.158
    CRITICAL FLOW VELOCITY HEAD(FEET) =            1.03
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      2.07
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            3.22
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      1.51
    FLOW AREA(SQUARE FEET) =      3.55
    FLOW TOP-WIDTH(FEET) =     3.000
    FLOW PRESSURE + MOMENTUM(POUNDS) =         1246.94
    FLOW VELOCITY(FEET/SEC.) =          12.678
    FLOW VELOCITY HEAD(FEET) =           2.496
    HYDRAULIC DEPTH(FEET) =      1.18
    FROUDE NUMBER =     2.054
    SPECIFIC ENERGY(FEET) =            4.00
==============================================================================
```

HYDRAULIC CALCULATION (3'W V-GUTTER SIZING)

```
******************************************************************************
                HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
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                           Analysis prepared by:



------------------------------------------------------------------------------
  TIME/DATE OF STUDY: 16:13 12/08/2020
==============================================================================
 Problem Descriptions:
  V-GUTTER SIZING
  FOR OFFSITE FLOW PICKUP

******************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
------------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =   1.50
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    1.00
            Z2(HORIZONTAL/VERTICAL) =    1.00
    BASEWIDTH(FEET) =     0.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.025000
    MANNINGS FRICTION FACTOR = 0.0150
==============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    >>>>> NORMAL DEPTH FLOW(CFS) =     23.09
    FLOW TOP-WIDTH(FEET) =         3.00
    FLOW AREA(SQUARE FEET) =           2.25
    HYDRAULIC DEPTH(FEET) =     0.75
    FLOW AVERAGE VELOCITY(FEET/SEC.) =    10.26
    UNIFORM FROUDE NUMBER =    2.088
    PRESSURE + MOMENTUM(POUNDS) =          529.43
    AVERAGED VELOCITY HEAD(FEET) =      1.635
    SPECIFIC ENERGY(FEET) =      3.135
==============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =         4.03
    CRITICAL FLOW AREA(SQUARE FEET) =           4.05
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     1.01
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     5.70
    CRITICAL DEPTH(FEET) =     2.01
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =          424.66
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.504
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      2.517
==============================================================================
```
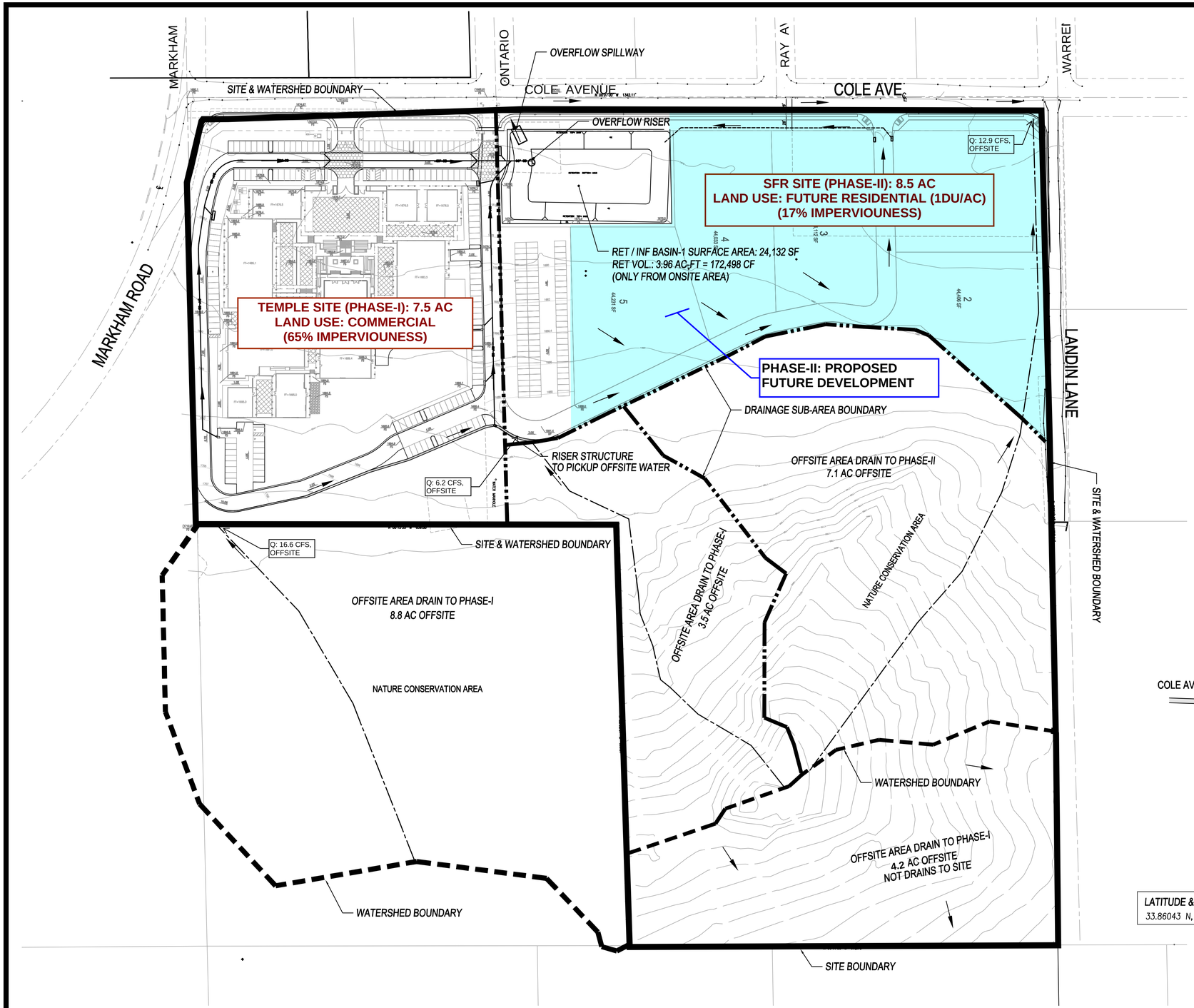
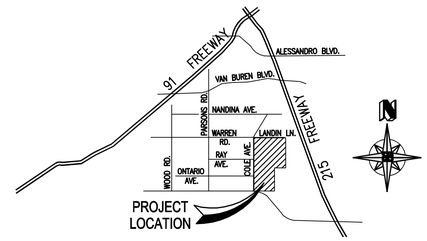
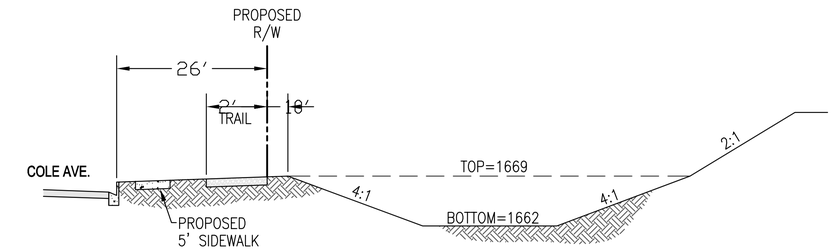

Conceptual Drainage Exhibit





VICINITY MAP
N.T.S.

PROJECT AREA: 30.8 AC
PHASE-I ON SITE: 7.5 AC
PHASE-II ONSITE: 8.5 AC (FUTURE)
UNDISTURBED SITE AREA DRAINS TO PH-I: 3.5 AC
UNDISTURBED OFFSITE AREA DRAINS TO PH-I: 8.8 AC
UNDISTURBED SITE AREA DRAINS TO PH-II: 7.1 AC
UNDISTURBED SITE AREA NOT DRAINS TO PH-II: 4.2 AC



RETENTION/INFILTRATION BASIN (TYP. DETAIL)
N.T.S.

LATITUDE & LONGITUDE
33.86043 N, 117.32195 W

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

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COUNTY OF RIVERSIDE
I KUAN TAO TEMPLE-PHASE-1 & 2
DRAINAGE EXHIBIT

PLOT DATE: December 09, 2020 ashafiq

Filename: I:\Riverside Temple\DWG's\ENTITLEMENT\EXHIBITS\DRAINAGE EXHIBIT-PH-1 and 2 ONSITE 12-8-2020.dwg