



FUTRONO ENGINEERING INC.

PRELIMINARY HYDROLOGY REPORT
for
C & S Coffee Shop Expansion
APN: 0586-351-16

PREP DATE: May 23, 2025

SITE: 55795 29 Palm Hwy.
Yucca Valley, CA 92284
APN: 0586-351-16

PREPARED FOR: Benji Reyes

PREPARED BY: *Futrono Engineering Inc.*
1430 E. Cooley Dr. Suite # 120
Colton CA 92324





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Introduction

Benji Reyes has retained Futrono Engineering Inc. to prepare a Hydrology Analysis for an undeveloped lot east of an existing C & S Coffee Shop at 55795 29 Palm Hwy. (APN: 0586-351-16).

The owner merged the undeveloped lot with the lot with the existing C & S Coffee Shop. The new undeveloped area will expand the C & S Coffee Shop. The owner will build a 1,120 sqft of covered patio, a 3,164 sq-ft of rotisserie chicken bar, a freshly baked bread bar, a fruit juice bar, an ice cream bar, also a new kitchen, a new storage room, two handicapped bathrooms. Finally, the project will create four new parking lots (2 lots will be ADA compliance) on the back part of the lot.

Purpose

This Hydrology Report aims to determine the stormwater runoff for the pre-developed and developed conditions and show the increased peak runoff due to the developed condition. The San Bernardino Hydrology Manual shows the intensity values of the 10-year and 100-year storm durations we use to calculate the runoff peak and the Unit Hydrographs for existing and developed conditions.

This property is in a FEMA flood zone (See map in the Reference Materials chapter).

Criteria

The criteria utilized for hydrology analysis is the San Bernardino County Hydrology Manual. The software, CivilID, was used to calculate storm water runoff rates for the pre-developed and developed condition.

Intensities values from NOAA were used.

Post development flow rate for 10 and 100 yr storm may not exceed 90% of existing conditions for 10 and 100 yr storm.

Site Location

The project site is located on 55795 29 Palm Hwy, city of Yucca Valley, County of San Bernardino, CA 92284. The area consists of 0.16 Ac. Currently there is a vacant lot.

The soil in the study is type B.



Results

Summary of the flows obtained from the rational method for the pre-developed and developed condition, 10, 25 and 100 year storm.

Pre-developed				Developed			
Node	10 year storm [cfs]	100 year storm [cfs]		Node	10 year storm [cfs]	100 year storm [cfs]	
20	0.45	1.00		40	0.80	1.70	

Pre-developed			Developed			Difference		
10 year [cfs]	100 year [cfs]		10 year [cfs]	100 year [cfs]		10 year [cfs]	100 year [cfs]	
0.45	1.00		0.80	1.70		0.35	0.70	

The difference between the pre-developed and the developed conditions for 10-and 100-year storms is minimal. Also, two 3' diameter and 46 feet long will intercept at least 645 cf of the flows before they exit the site.

Summary of the volumes obtained from the unit hydrograph for the pre-developed and developed condition 100-year storm 24 hour storm.

	Volume [Ac-ft]	Volume [cf]
UH Pre-developed	0.0336	1,463.6
UH Developed DMA-1	0.0484	2,108.3

UH Pre-developed	UH Developed	Difference
Volume [cf]	Volume [cf]	Volume [cf]
1,463.6	2,108.3	645

Volume Calculation

PIPE	LENGTH	VOLUME
ft	ft	cu-ft
3	46	325
3	46	325
	TOTAL	650



The two CMP perforated 3-foot-diameter, 46-foot-long pipes will retain 650 cf of rain flow to mitigate the 645 cf increase from the developed condition.

See details in the Developed Condition Exhibit



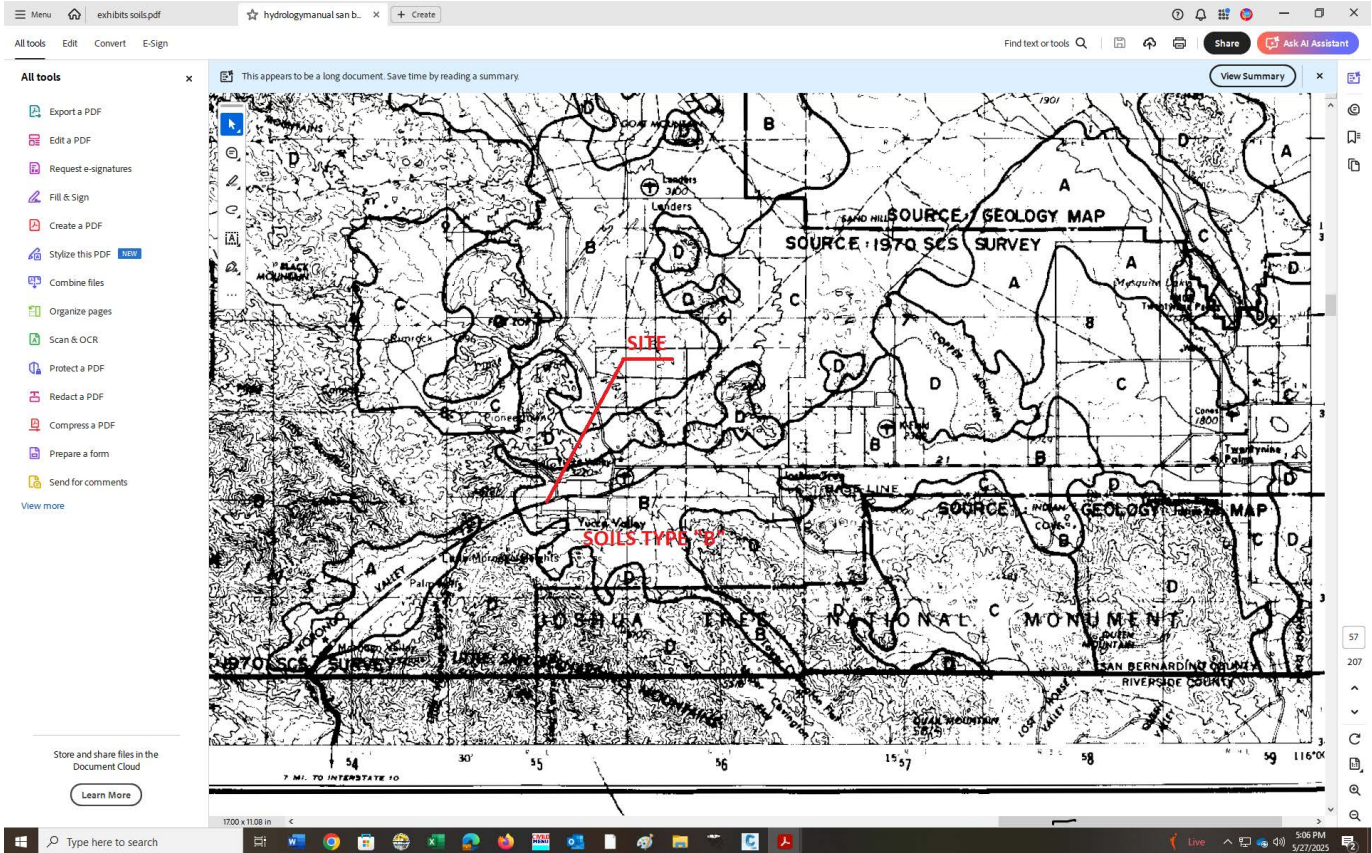
Hydrology Reference Material



Soil type



FUTRONO ENGINEERING INC.





Intensities



1/25/25, 2:48 PM

PF Map: Contiguous US

www.nws.noaa.gov

NOAA's National Weather Service
Hydrometeorological Design Studies Center
 Precipitation Frequency Data Server (PFDS)

Home Site Map Organization

Search NWS All NOAA Go



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 Precipitation
 Documents

Miscellaneous
 Publications
 Storm Analysis
 Record Precipitation

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NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

Data description

Data type: Units: Time series type:

Select location

1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: Longitude:

b) By station (list of CA stations):

c) By address

2) Use map:

Map Terrain

a) Select location
 Move crosshair or double click

b) Click on station icon
 Show stations on map

Location Information:
 Name: Yucca Valley, California, US
 Latitude: 34.1190°
 Longitude: -116.4473°
 Elevation: 3326 ft **

* Source: ESRI Maps
 ** Source: USGS

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES
 WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
 NOAA Atlas 14, Volume 6, Version 2

https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=ca



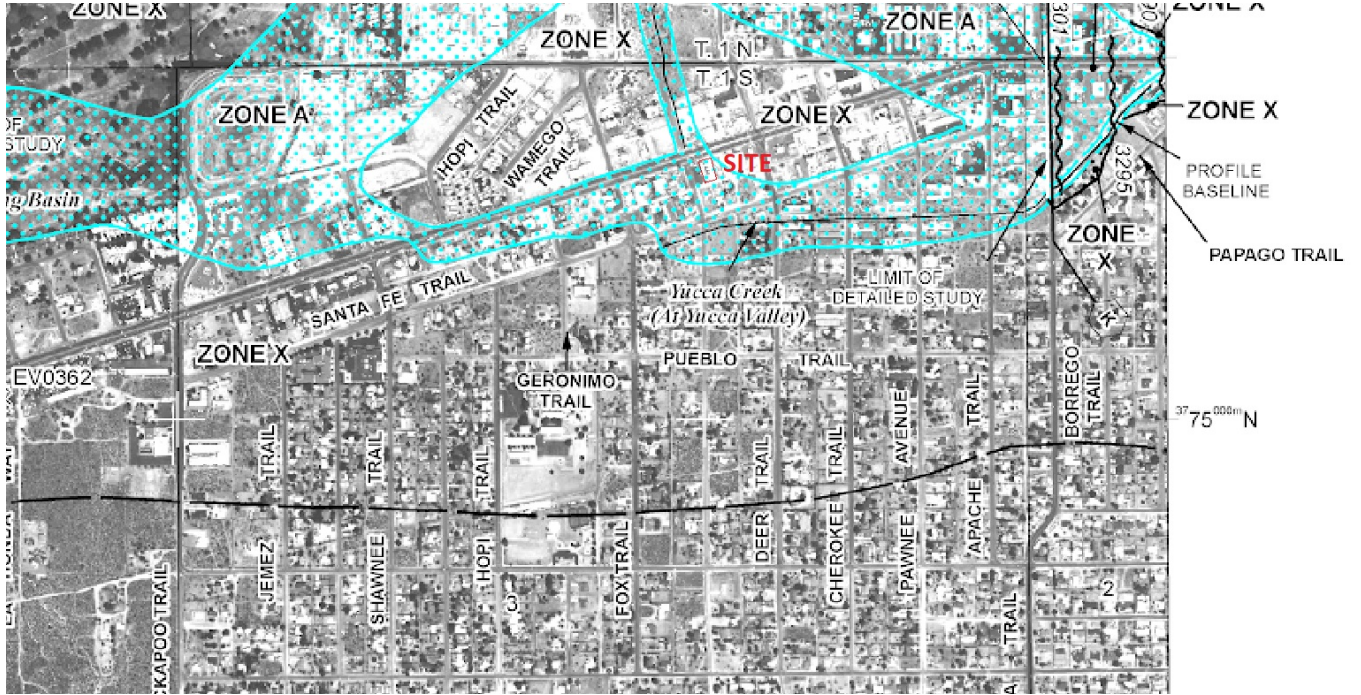
PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.089 (0.074-0.109)	0.132 (0.109-0.161)	0.195 (0.161-0.238)	0.253 (0.207-0.312)	0.343 (0.271-0.437)	0.422 (0.327-0.549)	0.512 (0.387-0.683)	0.616 (0.453-0.846)	0.779 (0.550-1.11)	1.03 (0.703-1.53)
10-min	0.128 (0.106-0.156)	0.188 (0.156-0.230)	0.279 (0.230-0.342)	0.362 (0.296-0.447)	0.491 (0.389-0.626)	0.604 (0.469-0.787)	0.733 (0.555-0.979)	0.883 (0.650-1.21)	1.12 (0.788-1.60)	1.48 (1.01-2.19)
15-min	0.155 (0.128-0.189)	0.228 (0.189-0.278)	0.337 (0.278-0.413)	0.438 (0.358-0.540)	0.594 (0.470-0.757)	0.731 (0.567-0.952)	0.887 (0.671-1.18)	1.07 (0.786-1.47)	1.35 (0.953-1.93)	1.79 (1.22-2.64)
30-min	0.235 (0.195-0.287)	0.347 (0.287-0.423)	0.513 (0.424-0.629)	0.666 (0.545-0.822)	0.904 (0.715-1.15)	1.11 (0.862-1.45)	1.35 (1.02-1.80)	1.62 (1.20-2.23)	2.05 (1.45-2.94)	2.72 (1.86-4.02)
60-min	0.330 (0.273-0.402)	0.487 (0.403-0.594)	0.720 (0.594-0.881)	0.934 (0.765-1.15)	1.27 (1.00-1.62)	1.56 (1.21-2.03)	1.89 (1.43-2.53)	2.28 (1.68-3.13)	2.88 (2.03-4.12)	3.81 (2.60-5.64)
2-hr	0.460 (0.381-0.561)	0.650 (0.538-0.793)	0.924 (0.763-1.13)	1.17 (0.958-1.44)	1.54 (1.22-1.97)	1.86 (1.44-2.42)	2.21 (1.67-2.95)	2.60 (1.92-3.57)	3.20 (2.26-4.58)	3.85 (2.63-5.70)
3-hr	0.550 (0.455-0.670)	0.764 (0.632-0.933)	1.07 (0.885-1.31)	1.34 (1.10-1.66)	1.75 (1.39-2.23)	2.09 (1.62-2.72)	2.47 (1.87-3.29)	2.89 (2.12-3.96)	3.51 (2.48-5.02)	4.04 (2.76-5.98)
6-hr	0.725 (0.600-0.884)	0.996 (0.824-1.22)	1.38 (1.14-1.69)	1.71 (1.40-2.11)	2.20 (1.74-2.81)	2.60 (2.02-3.39)	3.04 (2.30-4.06)	3.52 (2.59-4.83)	4.22 (2.98-6.04)	4.81 (3.28-7.12)
12-hr	0.906 (0.751-1.10)	1.25 (1.04-1.53)	1.74 (1.43-2.12)	2.16 (1.76-2.66)	2.77 (2.19-3.53)	3.27 (2.54-4.26)	3.82 (2.89-5.10)	4.42 (3.25-6.06)	5.29 (3.73-7.56)	6.02 (4.10-8.91)
24-hr	1.14 (1.01-1.31)	1.59 (1.41-1.83)	2.23 (1.97-2.58)	2.79 (2.44-3.26)	3.62 (3.07-4.36)	4.30 (3.57-5.29)	5.05 (4.09-6.35)	5.87 (4.63-7.59)	7.08 (5.36-9.53)	8.10 (5.93-11.3)
2-day	1.26 (1.11-1.45)	1.79 (1.58-2.06)	2.55 (2.25-2.95)	3.22 (2.82-3.75)	4.21 (3.57-5.07)	5.05 (4.19-6.20)	5.96 (4.83-7.49)	6.96 (5.49-9.01)	8.46 (6.41-11.4)	9.72 (7.12-13.5)
3-day	1.37 (1.21-1.58)	1.97 (1.74-2.27)	2.83 (2.50-3.28)	3.60 (3.15-4.20)	4.74 (4.02-5.71)	5.70 (4.74-7.01)	6.76 (5.48-8.51)	7.94 (6.26-10.3)	9.68 (7.34-13.0)	11.2 (8.18-15.6)
4-day	1.43 (1.26-1.64)	2.07 (1.83-2.39)	3.00 (2.64-3.47)	3.82 (3.34-4.45)	5.05 (4.28-6.08)	6.09 (5.06-7.48)	7.23 (5.87-9.10)	8.51 (6.72-11.0)	10.4 (7.89-14.0)	12.0 (8.81-16.8)
7-day	1.58 (1.40-1.82)	2.33 (2.06-2.69)	3.40 (3.00-3.94)	4.36 (3.82-5.08)	5.80 (4.91-6.98)	7.01 (5.82-8.62)	8.35 (6.77-10.5)	9.86 (7.78-12.7)	12.1 (9.16-16.3)	14.0 (10.3-19.5)
10-day	1.70 (1.50-1.96)	2.52 (2.23-2.91)	3.70 (3.26-4.27)	4.74 (4.15-5.53)	6.31 (5.34-7.59)	7.63 (6.34-9.38)	9.10 (7.38-11.4)	10.7 (8.47-13.9)	13.2 (9.99-17.8)	15.3 (11.2-21.3)
20-day	1.94 (1.72-2.23)	2.88 (2.55-3.32)	4.21 (3.72-4.87)	5.39 (4.72-6.28)	7.14 (6.05-8.60)	8.62 (7.16-10.6)	10.2 (8.30-12.9)	12.1 (9.51-15.6)	14.8 (11.2-19.9)	17.1 (12.5-23.8)
30-day	2.18 (1.93-2.51)	3.24 (2.86-3.73)	4.72 (4.17-5.46)	6.02 (5.27-7.02)	7.94 (6.73-9.56)	9.56 (7.94-11.7)	11.3 (9.19-14.3)	13.3 (10.5-17.2)	16.2 (12.3-21.9)	18.7 (13.7-26.1)
45-day	2.55 (2.26-2.93)	3.74 (3.31-4.31)	5.40 (4.77-6.24)	6.85 (6.00-7.98)	8.96 (7.60-10.8)	10.7 (8.90-13.2)	12.6 (10.3-15.9)	14.8 (11.7-19.1)	18.0 (13.6-24.2)	20.7 (15.1-28.8)
60-day	2.91 (2.58-3.35)	4.23 (3.74-4.88)	6.05 (5.34-7.00)	7.63 (6.68-8.90)	9.93 (8.42-12.0)	11.8 (9.82-14.5)	13.9 (11.3-17.5)	16.2 (12.8-20.9)	19.6 (14.8-26.4)	22.4 (16.4-31.3)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.



FEMA map





Rational method



Pre-developed Condition: 10, and 100 year storm



San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1

Rational Hydrology Study Date: 04/29/25

55975 29palm, Yucca Valley, CA

10 year storm

pre developed condition

Program License Serial Number 6561

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

Rational hydrology study storm event year is 10.0

Computed rainfall intensity:

Storm year = 10.00 1 hour rainfall = 0.934 (In.)

Slope used for rainfall intensity curve b = 0.7000

Soil antecedent moisture condition (AMC) = 2



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Process from Point/Station 10.000 to Point/Station 20.000

**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)

Initial subarea data:

Initial area flow distance = 138.000(Ft.)

Top (of initial area) elevation = 3526.000(Ft.)

Bottom (of initial area) elevation = 3523.500(Ft.)

Difference in elevation = 2.500(Ft.)

Slope = 0.01812 s(%)= 1.81

TC = $k(0.525)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$

Initial area time of concentration = 8.404 min.

Rainfall intensity = 3.697(In/Hr) for a 10.0 year storm

Effective runoff coefficient used for area (Q=KCIA) is C = 0.759

Subarea runoff = 0.449(CFS)

Total initial stream area = 0.160(Ac.)

Pervious area fraction = 1.000

Initial area Fm value = 0.578(In/Hr)

End of computations, Total Study Area = 0.16 (Ac.)



The following figures may

be used for a unit hydrograph study of the same area.

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 1.000

Area averaged SCS curve number = 67.0



San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1

Rational Hydrology Study Date: 04/29/25

55975 29palm, Yucca Valley, CA

100 year storm

pre developed condition

Program License Serial Number 6561

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

Rational hydrology study storm event year is 100.0

10 Year storm 1 hour rainfall = 0.934(In.)

100 Year storm 1 hour rainfall = 1.890(In.)

Computed rainfall intensity:

Storm year = 100.00 1 hour rainfall = 1.890 (In.)

Slope used for rainfall intensity curve b = 0.7000

Soil antecedent moisture condition (AMC) = 2



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Process from Point/Station 10.000 to Point/Station 20.000

**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)

Initial subarea data:

Initial area flow distance = 138.000(Ft.)

Top (of initial area) elevation = 3526.000(Ft.)

Bottom (of initial area) elevation = 3523.500(Ft.)

Difference in elevation = 2.500(Ft.)

Slope = 0.01812 s(%)= 1.81

TC = $k(0.525)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 8.404 min.

Rainfall intensity = 7.482(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area (Q=KCIA) is C = 0.830

Subarea runoff = 0.995(CFS)

Total initial stream area = 0.160(Ac.)

Pervious area fraction = 1.000

Initial area Fm value = 0.578(In/Hr)

End of computations, Total Study Area = 0.16 (Ac.)



The following figures may

be used for a unit hydrograph study of the same area.

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 1.000

Area averaged SCS curve number = 67.0



San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1

Rational Hydrology Study Date: 04/29/25

55975 29palm, Yucca Valley

10 year storm

Developed condition

Program License Serial Number 6561

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

Rational hydrology study storm event year is 10.0

Computed rainfall intensity:

Storm year = 10.00 1 hour rainfall = 0.934 (In.)

Slope used for rainfall intensity curve b = 0.7000

Soil antecedent moisture condition (AMC) = 2



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Process from Point/Station 10.000 to Point/Station 20.000

**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type

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

SCS curve number for soil(AMC 2) = 32.00

Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)

Initial subarea data:

Initial area flow distance = 54.000(Ft.)

Top (of initial area) elevation = 3334.000(Ft.)

Bottom (of initial area) elevation = 3333.000(Ft.)

Difference in elevation = 1.000(Ft.)

Slope = 0.01852 s(%)= 1.85

TC = $k(0.304)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$

Initial area time of concentration = 3.329 min.

Rainfall intensity = 7.070(In/Hr) for a 10.0 year storm

Effective runoff coefficient used for area (Q=KCIA) is C = 0.888

Subarea runoff = 0.126(CFS)

Total initial stream area = 0.020(Ac.)

Pervious area fraction = 0.100

Initial area Fm value = 0.098(In/Hr)

+++++



Process from Point/Station 20.000 to Point/Station 25.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 3330.000(Ft.)

Downstream point/station elevation = 3326.000(Ft.)

Pipe length = 8.00(Ft.) Manning's N = 0.010

No. of pipes = 1 Required pipe flow = 0.126(CFS)

Nearest computed pipe diameter = 3.00(In.)

Calculated individual pipe flow = 0.126(CFS)

Normal flow depth in pipe = 0.80(In.)

Flow top width inside pipe = 2.65(In.)

Critical Depth = 2.55(In.)

Pipe flow velocity = 11.99(Ft/s)

Travel time through pipe = 0.01 min.

Time of concentration (TC) = 3.34 min.

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Process from Point/Station 25.000 to Point/Station 30.000

**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)

Depth of flow = 0.261(Ft.), Average velocity = 1.687(Ft/s)

***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	1.00



2 2.00 0.00

3 3.00 1.00

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 0.173(CFS)

' ' flow top width = 0.783(Ft.)

' ' velocity= 1.687(Ft/s)

' ' area = 0.102(Sq.Ft)

' ' Froude number = 0.823

Upstream point elevation = 3326.000(Ft.)

Downstream point elevation = 3324.500(Ft.)

Flow length = 95.000(Ft.)

Travel time = 0.94 min.

Time of concentration = 4.28 min.

Depth of flow = 0.261(Ft.)

Average velocity = 1.687(Ft/s)

Total irregular channel flow = 0.173(CFS)

Irregular channel normal depth above invert elev. = 0.261(Ft.)

Average velocity of channel(s) = 1.687(Ft/s)

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)



Rainfall intensity = 5.931(In/Hr) for a 10.0 year storm
 Effective runoff coefficient used for area,(total area with modified
 rational method)(Q=KCIA) is C = 0.854
 Subarea runoff = 0.052(CFS) for 0.015(Ac.)
 Total runoff = 0.177(CFS)
 Effective area this stream = 0.04(Ac.)
 Total Study Area (Main Stream No. 1) = 0.04(Ac.)
 Area averaged Fm value = 0.304(In/Hr)
 Depth of flow = 0.264(Ft.), Average velocity = 1.698(Ft/s)

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Process from Point/Station 30.000 to Point/Station 30.000

**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
 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
 SCS curve number for soil(AMC 2) = 32.00
 Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)
 Time of concentration = 4.28 min.
 Rainfall intensity = 5.931(In/Hr) for a 10.0 year storm
 Effective runoff coefficient used for area,(total area with modified
 rational method)(Q=KCIA) is C = 0.877
 Subarea runoff = 0.525(CFS) for 0.100(Ac.)
 Total runoff = 0.702(CFS)



Effective area this stream = 0.14(Ac.)

Total Study Area (Main Stream No. 1) = 0.14(Ac.)

Area averaged Fm value = 0.151(In/Hr)

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Process from Point/Station 30.000 to Point/Station 40.000

**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)

Depth of flow = 0.404(Ft.), Average velocity = 2.921(Ft/s)

***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number 'X' coordinate 'Y' coordinate

1	0.00	1.00
2	2.00	0.00
3	3.00	1.00

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 0.715(CFS)

' ' flow top width = 1.212(Ft.)

' ' velocity= 2.921(Ft/s)

' ' area = 0.245(Sq.Ft)

' ' Froude number = 1.145

Upstream point elevation = 3324.500(Ft.)

Downstream point elevation = 3323.600(Ft.)



Flow length = 34.000(Ft.)

Travel time = 0.19 min.

Time of concentration = 4.47 min.

Depth of flow = 0.404(Ft.)

Average velocity = 2.921(Ft/s)

Total irregular channel flow = 0.715(CFS)

Irregular channel normal depth above invert elev. = 0.404(Ft.)

Average velocity of channel(s) = 2.921(Ft/s)

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

Decimal fraction soil group A = 1.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 0.000

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)

Rainfall intensity = 5.750(In/Hr) for a 10.0 year storm

Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.874

Subarea runoff = 0.001(CFS) for 0.005(Ac.)

Total runoff = 0.703(CFS)

Effective area this stream = 0.14(Ac.)

Total Study Area (Main Stream No. 1) = 0.14(Ac.)

Area averaged Fm value = 0.166(In/Hr)

Depth of flow = 0.402(Ft.), Average velocity = 2.909(Ft/s)

+++++



Process from Point/Station 40.000 to Point/Station 40.000

**** SUBAREA FLOW ADDITION ****

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(A_p) = 1.0000 Max loss rate(F_m)= 0.578(In/Hr)

Time of concentration = 4.47 min.

Rainfall intensity = 5.750(In/Hr) for a 10.0 year storm

Effective runoff coefficient used for area,(total area with modified rational method)($Q=KCIA$) is $C = 0.866$

Subarea runoff = 0.093(CFS) for 0.020(Ac.)

Total runoff = 0.797(CFS)

Effective area this stream = 0.16(Ac.)

Total Study Area (Main Stream No. 1) = 0.16(Ac.)

Area averaged F_m value = 0.218(In/Hr)

End of computations, Total Study Area = 0.16 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 0.325

Area averaged SCS curve number = 40.8



San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1

Rational Hydrology Study Date: 04/29/25

55975 29palm, Yucca Valley

100 year storm

Developed condition

Program License Serial Number 6561

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

Rational hydrology study storm event year is 100.0

Computed rainfall intensity:

Storm year = 100.00 1 hour rainfall = 1.890 (In.)

Slope used for rainfall intensity curve b = 0.7000

Soil antecedent moisture condition (AMC) = 2



+++++

Process from Point/Station 10.000 to Point/Station 20.000

**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type

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

SCS curve number for soil(AMC 2) = 32.00

Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)

Initial subarea data:

Initial area flow distance = 54.000(Ft.)

Top (of initial area) elevation = 3334.000(Ft.)

Bottom (of initial area) elevation = 3333.000(Ft.)

Difference in elevation = 1.000(Ft.)

Slope = 0.01852 s(%)= 1.85

TC = $k(0.304)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 3.329 min.

Rainfall intensity = 14.307(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area (Q=KCIA) is C = 0.894

Subarea runoff = 0.256(CFS)

Total initial stream area = 0.020(Ac.)

Pervious area fraction = 0.100

Initial area Fm value = 0.098(In/Hr)

+++++



Process from Point/Station 20.000 to Point/Station 25.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 3330.000(Ft.)

Downstream point/station elevation = 3326.000(Ft.)

Pipe length = 8.00(Ft.) Manning's N = 0.010

No. of pipes = 1 Required pipe flow = 0.256(CFS)

Nearest computed pipe diameter = 3.00(In.)

Calculated individual pipe flow = 0.256(CFS)

Normal flow depth in pipe = 1.16(In.)

Flow top width inside pipe = 2.92(In.)

Critical depth could not be calculated.

Pipe flow velocity = 14.65(Ft/s)

Travel time through pipe = 0.01 min.

Time of concentration (TC) = 3.34 min.

+++++

Process from Point/Station 25.000 to Point/Station 30.000

**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)

Depth of flow = 0.341(Ft.), Average velocity = 2.015(Ft/s)

***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	1.00



2 2.00 0.00

3 3.00 1.00

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 0.352(CFS)

' ' flow top width = 1.023(Ft.)

' ' velocity= 2.015(Ft/s)

' ' area = 0.175(Sq.Ft)

' ' Froude number = 0.860

Upstream point elevation = 3326.000(Ft.)

Downstream point elevation = 3324.500(Ft.)

Flow length = 95.000(Ft.)

Travel time = 0.79 min.

Time of concentration = 4.12 min.

Depth of flow = 0.341(Ft.)

Average velocity = 2.015(Ft/s)

Total irregular channel flow = 0.352(CFS)

Irregular channel normal depth above invert elev. = 0.341(Ft.)

Average velocity of channel(s) = 2.015(Ft/s)

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)



Rainfall intensity = 12.316(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.878

Subarea runoff = 0.123(CFS) for 0.015(Ac.)

Total runoff = 0.378(CFS)

Effective area this stream = 0.04(Ac.)

Total Study Area (Main Stream No. 1) = 0.04(Ac.)

Area averaged Fm value = 0.304(In/Hr)

Depth of flow = 0.351(Ft.), Average velocity = 2.053(Ft/s)

+++++

Process from Point/Station 30.000 to Point/Station 30.000

**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type

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

SCS curve number for soil(AMC 2) = 32.00

Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)

Time of concentration = 4.12 min.

Rainfall intensity = 12.316(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.889

Subarea runoff = 1.100(CFS) for 0.100(Ac.)

Total runoff = 1.478(CFS)



Effective area this stream = 0.14(Ac.)

Total Study Area (Main Stream No. 1) = 0.14(Ac.)

Area averaged Fm value = 0.151(In/Hr)

+++++

Process from Point/Station 30.000 to Point/Station 40.000

**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)

Depth of flow = 0.534(Ft.), Average velocity = 3.519(Ft/s)

***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number 'X' coordinate 'Y' coordinate

1	0.00	1.00
2	2.00	0.00
3	3.00	1.00

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 1.505(CFS)

' ' flow top width = 1.602(Ft.)

' ' velocity= 3.519(Ft/s)

' ' area = 0.428(Sq.Ft)

' ' Froude number = 1.200

Upstream point elevation = 3324.500(Ft.)

Downstream point elevation = 3323.600(Ft.)



Flow length = 34.000(Ft.)

Travel time = 0.16 min.

Time of concentration = 4.28 min.

Depth of flow = 0.534(Ft.)

Average velocity = 3.519(Ft/s)

Total irregular channel flow = 1.505(CFS)

Irregular channel normal depth above invert elev. = 0.534(Ft.)

Average velocity of channel(s) = 3.519(Ft/s)

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)

Rainfall intensity = 11.990(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.888

Subarea runoff = 0.012(CFS) for 0.005(Ac.)

Total runoff = 1.490(CFS)

Effective area this stream = 0.14(Ac.)

Total Study Area (Main Stream No. 1) = 0.14(Ac.)

Area averaged Fm value = 0.166(In/Hr)

Depth of flow = 0.532(Ft.), Average velocity = 3.509(Ft/s)

+++++



Process from Point/Station 40.000 to Point/Station 40.000

**** SUBAREA FLOW ADDITION ****

UNDEVELOPED (poor cover) subarea

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

SCS curve number for soil(AMC 2) = 67.00

Pervious ratio(A_p) = 1.0000 Max loss rate(F_m)= 0.578(In/Hr)

Time of concentration = 4.28 min.

Rainfall intensity = 11.990(In/Hr) for a 100.0 year storm

Effective runoff coefficient used for area,(total area with modified rational method)($Q=KCIA$) is $C = 0.884$

Subarea runoff = 0.205(CFS) for 0.020(Ac.)

Total runoff = 1.695(CFS)

Effective area this stream = 0.16(Ac.)

Total Study Area (Main Stream No. 1) = 0.16(Ac.)

Area averaged F_m value = 0.218(In/Hr)

End of computations, Total Study Area = 0.16 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 0.325

Area averaged SCS curve number = 40.8



FUTRONO ENGINEERING INC.



Unit Hydrograph



Pre-developed Condition: 100 year storm

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

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Study date 04/30/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6561

55975 29 palm Yucca valley
100 year storm 24 hr
Pre-developed condition

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
0.16	1	1.89

Rainfall data for year 10		
0.16	6	3.04

Rainfall data for year 10



0.16 24 5.05

+++++

***** Area-averaged max loss rate, Fm *****

SCS curve No. (AMCII)	SCS curve NO. (AMC 2)	Area (Ac.)	Area Fraction	Fp (Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
67.0	67.0	0.16	1.000	0.578	1.000	0.578

Area-averaged adjusted loss rate Fm (In/Hr) = 0.578

***** Area-Averaged low loss rate fraction, Yb *****

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.16	1.000	67.0	67.0	4.93	0.364

Area-averaged catchment yield fraction, Y = 0.364

Area-averaged low loss fraction, Yb = 0.636

Direct entry of lag time by user

+++++

Watershed area = 0.16 (Ac.)
 Catchment Lag time = 0.112 hours
 Unit interval = 5.000 minutes
 Unit interval percentage of lag time = 74.3384
 Hydrograph baseflow = 0.00 (CFS)
 Average maximum watershed loss rate (Fm) = 0.578 (In/Hr)
 Average low loss rate fraction (Yb) = 0.636 (decimal)
 MOUNTAIN S-Graph Selected
 Computed peak 5-minute rainfall = 0.897 (In)
 Computed peak 30-minute rainfall = 1.535 (In)
 Specified peak 1-hour rainfall = 1.890 (In)
 Computed peak 3-hour rainfall = 2.529 (In)
 Specified peak 6-hour rainfall = 3.040 (In)
 Specified peak 24-hour rainfall = 5.050 (In)

Rainfall depth area reduction factors:

Using a total area of 0.16 (Ac.) (Ref: fig. E-4)

5-minute factor = 1.000	Adjusted rainfall = 0.897 (In)
30-minute factor = 1.000	Adjusted rainfall = 1.535 (In)
1-hour factor = 1.000	Adjusted rainfall = 1.890 (In)
3-hour factor = 1.000	Adjusted rainfall = 2.529 (In)
6-hour factor = 1.000	Adjusted rainfall = 3.040 (In)
24-hour factor = 1.000	Adjusted rainfall = 5.050 (In)

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

+++++



Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
--------------------	--------------------------	------------------------------

(K = 1.93 (CFS))

1	15.253	0.295
2	52.268	0.716
3	67.106	0.287
4	75.591	0.164
5	81.204	0.109
6	85.118	0.076
7	88.205	0.060
8	90.714	0.049
9	92.823	0.041
10	94.599	0.034
11	96.049	0.028
12	97.388	0.026
13	98.726	0.026
14	100.000	0.025

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
---------------------	--------------------------------	-----------------------

1	0.8968	0.8968
2	1.1041	0.2073
3	1.2469	0.1428
4	1.3593	0.1124
5	1.4534	0.0941
6	1.5351	0.0817
7	1.6078	0.0727
8	1.6735	0.0657
9	1.7337	0.0602
10	1.7894	0.0557
11	1.8413	0.0519
12	1.8900	0.0487
13	1.9305	0.0406
14	1.9689	0.0383
15	2.0052	0.0364
16	2.0399	0.0346
17	2.0729	0.0331
18	2.1046	0.0317
19	2.1350	0.0304
20	2.1642	0.0292
21	2.1924	0.0282
22	2.2197	0.0272
23	2.2460	0.0263
24	2.2715	0.0255
25	2.2962	0.0247
26	2.3202	0.0240
27	2.3436	0.0233
28	2.3663	0.0227
29	2.3884	0.0221
30	2.4100	0.0216



31	2.4311	0.0211
32	2.4516	0.0206
33	2.4717	0.0201
34	2.4914	0.0197
35	2.5106	0.0192
36	2.5294	0.0188
37	2.5479	0.0185
38	2.5660	0.0181
39	2.5837	0.0177
40	2.6011	0.0174
41	2.6182	0.0171
42	2.6350	0.0168
43	2.6515	0.0165
44	2.6677	0.0162
45	2.6837	0.0160
46	2.6994	0.0157
47	2.7148	0.0154
48	2.7300	0.0152
49	2.7450	0.0150
50	2.7597	0.0147
51	2.7743	0.0145
52	2.7886	0.0143
53	2.8027	0.0141
54	2.8166	0.0139
55	2.8304	0.0137
56	2.8439	0.0136
57	2.8573	0.0134
58	2.8705	0.0132
59	2.8836	0.0130
60	2.8965	0.0129
61	2.9092	0.0127
62	2.9218	0.0126
63	2.9342	0.0124
64	2.9465	0.0123
65	2.9586	0.0121
66	2.9706	0.0120
67	2.9825	0.0119
68	2.9943	0.0117
69	3.0059	0.0116
70	3.0174	0.0115
71	3.0287	0.0114
72	3.0400	0.0113
73	3.0554	0.0154
74	3.0706	0.0153
75	3.0858	0.0151
76	3.1008	0.0150
77	3.1156	0.0149
78	3.1304	0.0148
79	3.1450	0.0146
80	3.1596	0.0145
81	3.1740	0.0144
82	3.1882	0.0143



83	3.2024	0.0142
84	3.2165	0.0141
85	3.2305	0.0140
86	3.2443	0.0139
87	3.2581	0.0138
88	3.2717	0.0137
89	3.2853	0.0136
90	3.2988	0.0135
91	3.3121	0.0134
92	3.3254	0.0133
93	3.3386	0.0132
94	3.3517	0.0131
95	3.3647	0.0130
96	3.3776	0.0129
97	3.3905	0.0128
98	3.4032	0.0128
99	3.4159	0.0127
100	3.4285	0.0126
101	3.4410	0.0125
102	3.4535	0.0124
103	3.4658	0.0124
104	3.4781	0.0123
105	3.4903	0.0122
106	3.5024	0.0121
107	3.5145	0.0121
108	3.5265	0.0120
109	3.5384	0.0119
110	3.5503	0.0119
111	3.5620	0.0118
112	3.5737	0.0117
113	3.5854	0.0116
114	3.5970	0.0116
115	3.6085	0.0115
116	3.6200	0.0115
117	3.6313	0.0114
118	3.6427	0.0113
119	3.6540	0.0113
120	3.6652	0.0112
121	3.6763	0.0112
122	3.6874	0.0111
123	3.6984	0.0110
124	3.7094	0.0110
125	3.7204	0.0109
126	3.7312	0.0109
127	3.7420	0.0108
128	3.7528	0.0108
129	3.7635	0.0107
130	3.7742	0.0107
131	3.7848	0.0106
132	3.7953	0.0106
133	3.8058	0.0105
134	3.8163	0.0105



135	3.8267	0.0104
136	3.8370	0.0104
137	3.8473	0.0103
138	3.8576	0.0103
139	3.8678	0.0102
140	3.8780	0.0102
141	3.8881	0.0101
142	3.8981	0.0101
143	3.9082	0.0100
144	3.9182	0.0100
145	3.9281	0.0099
146	3.9380	0.0099
147	3.9479	0.0099
148	3.9577	0.0098
149	3.9674	0.0098
150	3.9772	0.0097
151	3.9868	0.0097
152	3.9965	0.0096
153	4.0061	0.0096
154	4.0157	0.0096
155	4.0252	0.0095
156	4.0347	0.0095
157	4.0441	0.0094
158	4.0535	0.0094
159	4.0629	0.0094
160	4.0723	0.0093
161	4.0815	0.0093
162	4.0908	0.0093
163	4.1000	0.0092
164	4.1092	0.0092
165	4.1184	0.0092
166	4.1275	0.0091
167	4.1366	0.0091
168	4.1456	0.0091
169	4.1547	0.0090
170	4.1636	0.0090
171	4.1726	0.0090
172	4.1815	0.0089
173	4.1904	0.0089
174	4.1992	0.0089
175	4.2081	0.0088
176	4.2169	0.0088
177	4.2256	0.0088
178	4.2343	0.0087
179	4.2430	0.0087
180	4.2517	0.0087
181	4.2603	0.0086
182	4.2689	0.0086
183	4.2775	0.0086
184	4.2860	0.0085
185	4.2946	0.0085
186	4.3030	0.0085



187	4.3115	0.0085
188	4.3199	0.0084
189	4.3283	0.0084
190	4.3367	0.0084
191	4.3450	0.0083
192	4.3533	0.0083
193	4.3616	0.0083
194	4.3699	0.0083
195	4.3781	0.0082
196	4.3863	0.0082
197	4.3945	0.0082
198	4.4027	0.0082
199	4.4108	0.0081
200	4.4189	0.0081
201	4.4270	0.0081
202	4.4350	0.0081
203	4.4430	0.0080
204	4.4510	0.0080
205	4.4590	0.0080
206	4.4670	0.0080
207	4.4749	0.0079
208	4.4828	0.0079
209	4.4907	0.0079
210	4.4985	0.0079
211	4.5064	0.0078
212	4.5142	0.0078
213	4.5220	0.0078
214	4.5297	0.0078
215	4.5375	0.0077
216	4.5452	0.0077
217	4.5529	0.0077
218	4.5605	0.0077
219	4.5682	0.0076
220	4.5758	0.0076
221	4.5834	0.0076
222	4.5910	0.0076
223	4.5986	0.0076
224	4.6061	0.0075
225	4.6136	0.0075
226	4.6211	0.0075
227	4.6286	0.0075
228	4.6360	0.0075
229	4.6435	0.0074
230	4.6509	0.0074
231	4.6583	0.0074
232	4.6657	0.0074
233	4.6730	0.0074
234	4.6803	0.0073
235	4.6876	0.0073
236	4.6949	0.0073
237	4.7022	0.0073
238	4.7095	0.0073



239	4.7167	0.0072
240	4.7239	0.0072
241	4.7311	0.0072
242	4.7383	0.0072
243	4.7455	0.0072
244	4.7526	0.0071
245	4.7597	0.0071
246	4.7668	0.0071
247	4.7739	0.0071
248	4.7810	0.0071
249	4.7880	0.0070
250	4.7951	0.0070
251	4.8021	0.0070
252	4.8091	0.0070
253	4.8160	0.0070
254	4.8230	0.0070
255	4.8299	0.0069
256	4.8369	0.0069
257	4.8438	0.0069
258	4.8507	0.0069
259	4.8575	0.0069
260	4.8644	0.0069
261	4.8712	0.0068
262	4.8781	0.0068
263	4.8849	0.0068
264	4.8917	0.0068
265	4.8984	0.0068
266	4.9052	0.0068
267	4.9119	0.0067
268	4.9187	0.0067
269	4.9254	0.0067
270	4.9321	0.0067
271	4.9388	0.0067
272	4.9454	0.0067
273	4.9521	0.0066
274	4.9587	0.0066
275	4.9653	0.0066
276	4.9719	0.0066
277	4.9785	0.0066
278	4.9851	0.0066
279	4.9916	0.0066
280	4.9982	0.0065
281	5.0047	0.0065
282	5.0112	0.0065
283	5.0177	0.0065
284	5.0242	0.0065
285	5.0307	0.0065
286	5.0371	0.0065
287	5.0436	0.0064
288	5.0500	0.0064

Unit

Unit

Unit

Effective



Period (number)	Rainfall (In)	Soil-Loss (In)	Rainfall (In)
1	0.0064	0.0041	0.0023
2	0.0064	0.0041	0.0023
3	0.0065	0.0041	0.0024
4	0.0065	0.0041	0.0024
5	0.0065	0.0041	0.0024
6	0.0065	0.0042	0.0024
7	0.0066	0.0042	0.0024
8	0.0066	0.0042	0.0024
9	0.0066	0.0042	0.0024
10	0.0066	0.0042	0.0024
11	0.0066	0.0042	0.0024
12	0.0067	0.0042	0.0024
13	0.0067	0.0043	0.0024
14	0.0067	0.0043	0.0024
15	0.0067	0.0043	0.0025
16	0.0068	0.0043	0.0025
17	0.0068	0.0043	0.0025
18	0.0068	0.0043	0.0025
19	0.0068	0.0044	0.0025
20	0.0069	0.0044	0.0025
21	0.0069	0.0044	0.0025
22	0.0069	0.0044	0.0025
23	0.0069	0.0044	0.0025
24	0.0070	0.0044	0.0025
25	0.0070	0.0044	0.0025
26	0.0070	0.0045	0.0026
27	0.0070	0.0045	0.0026
28	0.0071	0.0045	0.0026
29	0.0071	0.0045	0.0026
30	0.0071	0.0045	0.0026
31	0.0072	0.0046	0.0026
32	0.0072	0.0046	0.0026
33	0.0072	0.0046	0.0026
34	0.0072	0.0046	0.0026
35	0.0073	0.0046	0.0026
36	0.0073	0.0046	0.0027
37	0.0073	0.0047	0.0027
38	0.0074	0.0047	0.0027
39	0.0074	0.0047	0.0027
40	0.0074	0.0047	0.0027
41	0.0075	0.0047	0.0027
42	0.0075	0.0048	0.0027
43	0.0075	0.0048	0.0027
44	0.0075	0.0048	0.0027
45	0.0076	0.0048	0.0028
46	0.0076	0.0048	0.0028
47	0.0076	0.0049	0.0028
48	0.0077	0.0049	0.0028
49	0.0077	0.0049	0.0028



50	0.0077	0.0049	0.0028
51	0.0078	0.0050	0.0028
52	0.0078	0.0050	0.0028
53	0.0079	0.0050	0.0029
54	0.0079	0.0050	0.0029
55	0.0079	0.0050	0.0029
56	0.0080	0.0051	0.0029
57	0.0080	0.0051	0.0029
58	0.0080	0.0051	0.0029
59	0.0081	0.0051	0.0029
60	0.0081	0.0052	0.0029
61	0.0082	0.0052	0.0030
62	0.0082	0.0052	0.0030
63	0.0082	0.0052	0.0030
64	0.0083	0.0053	0.0030
65	0.0083	0.0053	0.0030
66	0.0083	0.0053	0.0030
67	0.0084	0.0053	0.0031
68	0.0084	0.0054	0.0031
69	0.0085	0.0054	0.0031
70	0.0085	0.0054	0.0031
71	0.0086	0.0055	0.0031
72	0.0086	0.0055	0.0031
73	0.0087	0.0055	0.0032
74	0.0087	0.0055	0.0032
75	0.0088	0.0056	0.0032
76	0.0088	0.0056	0.0032
77	0.0089	0.0056	0.0032
78	0.0089	0.0057	0.0032
79	0.0090	0.0057	0.0033
80	0.0090	0.0057	0.0033
81	0.0091	0.0058	0.0033
82	0.0091	0.0058	0.0033
83	0.0092	0.0058	0.0033
84	0.0092	0.0058	0.0033
85	0.0093	0.0059	0.0034
86	0.0093	0.0059	0.0034
87	0.0094	0.0060	0.0034
88	0.0094	0.0060	0.0034
89	0.0095	0.0060	0.0035
90	0.0095	0.0061	0.0035
91	0.0096	0.0061	0.0035
92	0.0096	0.0061	0.0035
93	0.0097	0.0062	0.0035
94	0.0098	0.0062	0.0036
95	0.0099	0.0063	0.0036
96	0.0099	0.0063	0.0036
97	0.0100	0.0064	0.0036
98	0.0100	0.0064	0.0036
99	0.0101	0.0064	0.0037
100	0.0102	0.0065	0.0037
101	0.0103	0.0065	0.0037



102	0.0103	0.0066	0.0038
103	0.0104	0.0066	0.0038
104	0.0105	0.0066	0.0038
105	0.0106	0.0067	0.0038
106	0.0106	0.0067	0.0039
107	0.0107	0.0068	0.0039
108	0.0108	0.0068	0.0039
109	0.0109	0.0069	0.0040
110	0.0109	0.0069	0.0040
111	0.0110	0.0070	0.0040
112	0.0111	0.0071	0.0040
113	0.0112	0.0071	0.0041
114	0.0113	0.0072	0.0041
115	0.0114	0.0072	0.0041
116	0.0115	0.0073	0.0042
117	0.0116	0.0074	0.0042
118	0.0116	0.0074	0.0042
119	0.0118	0.0075	0.0043
120	0.0119	0.0075	0.0043
121	0.0120	0.0076	0.0044
122	0.0121	0.0077	0.0044
123	0.0122	0.0078	0.0044
124	0.0123	0.0078	0.0045
125	0.0124	0.0079	0.0045
126	0.0125	0.0080	0.0046
127	0.0127	0.0081	0.0046
128	0.0128	0.0081	0.0046
129	0.0129	0.0082	0.0047
130	0.0130	0.0083	0.0047
131	0.0132	0.0084	0.0048
132	0.0133	0.0084	0.0048
133	0.0135	0.0086	0.0049
134	0.0136	0.0086	0.0049
135	0.0138	0.0088	0.0050
136	0.0139	0.0088	0.0050
137	0.0141	0.0090	0.0051
138	0.0142	0.0090	0.0052
139	0.0144	0.0092	0.0052
140	0.0145	0.0092	0.0053
141	0.0148	0.0094	0.0054
142	0.0149	0.0095	0.0054
143	0.0151	0.0096	0.0055
144	0.0153	0.0097	0.0056
145	0.0113	0.0072	0.0041
146	0.0114	0.0072	0.0041
147	0.0116	0.0074	0.0042
148	0.0117	0.0075	0.0043
149	0.0120	0.0076	0.0044
150	0.0121	0.0077	0.0044
151	0.0124	0.0079	0.0045
152	0.0126	0.0080	0.0046
153	0.0129	0.0082	0.0047



154	0.0130	0.0083	0.0047
155	0.0134	0.0085	0.0049
156	0.0136	0.0086	0.0049
157	0.0139	0.0089	0.0051
158	0.0141	0.0090	0.0051
159	0.0145	0.0092	0.0053
160	0.0147	0.0094	0.0054
161	0.0152	0.0097	0.0055
162	0.0154	0.0098	0.0056
163	0.0160	0.0101	0.0058
164	0.0162	0.0103	0.0059
165	0.0168	0.0107	0.0061
166	0.0171	0.0109	0.0062
167	0.0177	0.0113	0.0065
168	0.0181	0.0115	0.0066
169	0.0188	0.0120	0.0069
170	0.0192	0.0122	0.0070
171	0.0201	0.0128	0.0073
172	0.0206	0.0131	0.0075
173	0.0216	0.0137	0.0079
174	0.0221	0.0141	0.0081
175	0.0233	0.0148	0.0085
176	0.0240	0.0153	0.0087
177	0.0255	0.0162	0.0093
178	0.0263	0.0167	0.0096
179	0.0282	0.0179	0.0103
180	0.0292	0.0186	0.0106
181	0.0317	0.0201	0.0115
182	0.0331	0.0210	0.0120
183	0.0364	0.0231	0.0132
184	0.0383	0.0244	0.0139
185	0.0487	0.0310	0.0177
186	0.0519	0.0330	0.0189
187	0.0602	0.0383	0.0219
188	0.0657	0.0418	0.0239
189	0.0817	0.0482	0.0335
190	0.0941	0.0482	0.0459
191	0.1428	0.0482	0.0946
192	0.2073	0.0482	0.1591
193	0.8968	0.0482	0.8486
194	0.1124	0.0482	0.0642
195	0.0727	0.0462	0.0264
196	0.0557	0.0354	0.0203
197	0.0406	0.0258	0.0148
198	0.0346	0.0220	0.0126
199	0.0304	0.0193	0.0111
200	0.0272	0.0173	0.0099
201	0.0247	0.0157	0.0090
202	0.0227	0.0144	0.0083
203	0.0211	0.0134	0.0077
204	0.0197	0.0125	0.0072
205	0.0185	0.0117	0.0067



206	0.0174	0.0111	0.0063
207	0.0165	0.0105	0.0060
208	0.0157	0.0100	0.0057
209	0.0150	0.0095	0.0054
210	0.0143	0.0091	0.0052
211	0.0137	0.0087	0.0050
212	0.0132	0.0084	0.0048
213	0.0127	0.0081	0.0046
214	0.0123	0.0078	0.0045
215	0.0119	0.0076	0.0043
216	0.0115	0.0073	0.0042
217	0.0154	0.0098	0.0056
218	0.0150	0.0095	0.0055
219	0.0146	0.0093	0.0053
220	0.0143	0.0091	0.0052
221	0.0140	0.0089	0.0051
222	0.0137	0.0087	0.0050
223	0.0134	0.0085	0.0049
224	0.0131	0.0083	0.0048
225	0.0128	0.0082	0.0047
226	0.0126	0.0080	0.0046
227	0.0124	0.0079	0.0045
228	0.0121	0.0077	0.0044
229	0.0119	0.0076	0.0043
230	0.0117	0.0075	0.0043
231	0.0115	0.0073	0.0042
232	0.0113	0.0072	0.0041
233	0.0112	0.0071	0.0041
234	0.0110	0.0070	0.0040
235	0.0108	0.0069	0.0039
236	0.0107	0.0068	0.0039
237	0.0105	0.0067	0.0038
238	0.0104	0.0066	0.0038
239	0.0102	0.0065	0.0037
240	0.0101	0.0064	0.0037
241	0.0099	0.0063	0.0036
242	0.0098	0.0062	0.0036
243	0.0097	0.0062	0.0035
244	0.0096	0.0061	0.0035
245	0.0094	0.0060	0.0034
246	0.0093	0.0059	0.0034
247	0.0092	0.0059	0.0034
248	0.0091	0.0058	0.0033
249	0.0090	0.0057	0.0033
250	0.0089	0.0057	0.0032
251	0.0088	0.0056	0.0032
252	0.0087	0.0055	0.0032
253	0.0086	0.0055	0.0031
254	0.0085	0.0054	0.0031
255	0.0085	0.0054	0.0031
256	0.0084	0.0053	0.0030
257	0.0083	0.0053	0.0030



258	0.0082	0.0052	0.0030
259	0.0081	0.0052	0.0030
260	0.0081	0.0051	0.0029
261	0.0080	0.0051	0.0029
262	0.0079	0.0050	0.0029
263	0.0078	0.0050	0.0028
264	0.0078	0.0049	0.0028
265	0.0077	0.0049	0.0028
266	0.0076	0.0049	0.0028
267	0.0076	0.0048	0.0028
268	0.0075	0.0048	0.0027
269	0.0074	0.0047	0.0027
270	0.0074	0.0047	0.0027
271	0.0073	0.0047	0.0027
272	0.0073	0.0046	0.0026
273	0.0072	0.0046	0.0026
274	0.0071	0.0045	0.0026
275	0.0071	0.0045	0.0026
276	0.0070	0.0045	0.0026
277	0.0070	0.0044	0.0025
278	0.0069	0.0044	0.0025
279	0.0069	0.0044	0.0025
280	0.0068	0.0043	0.0025
281	0.0068	0.0043	0.0025
282	0.0067	0.0043	0.0024
283	0.0067	0.0042	0.0024
284	0.0066	0.0042	0.0024
285	0.0066	0.0042	0.0024
286	0.0065	0.0042	0.0024
287	0.0065	0.0041	0.0024
288	0.0065	0.0041	0.0023

 Total soil rain loss = 2.52(In)
 Total effective rainfall = 2.53(In)
 Peak flow rate in flood hydrograph = 0.70(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0000	0.00	Q				
0+15	0.0000	0.00	Q				
0+20	0.0001	0.00	Q				
0+25	0.0001	0.00	Q				
0+30	0.0001	0.00	Q				



0+35	0.0001	0.00	Q				
0+40	0.0002	0.00	Q				
0+45	0.0002	0.00	Q				
0+50	0.0002	0.00	Q				
0+55	0.0003	0.00	Q				
1+ 0	0.0003	0.00	Q				
1+ 5	0.0003	0.00	Q				
1+10	0.0004	0.00	Q				
1+15	0.0004	0.00	Q				
1+20	0.0004	0.00	Q				
1+25	0.0005	0.00	Q				
1+30	0.0005	0.00	Q				
1+35	0.0005	0.00	Q				
1+40	0.0006	0.00	Q				
1+45	0.0006	0.00	Q				
1+50	0.0006	0.00	Q				
1+55	0.0007	0.00	Q				
2+ 0	0.0007	0.00	Q				
2+ 5	0.0007	0.00	Q				
2+10	0.0008	0.00	Q				
2+15	0.0008	0.00	Q				
2+20	0.0008	0.00	Q				
2+25	0.0009	0.00	QV				
2+30	0.0009	0.00	QV				
2+35	0.0009	0.00	QV				
2+40	0.0010	0.01	QV				
2+45	0.0010	0.01	QV				
2+50	0.0010	0.01	QV				
2+55	0.0011	0.01	QV				
3+ 0	0.0011	0.01	QV				
3+ 5	0.0011	0.01	QV				
3+10	0.0012	0.01	QV				
3+15	0.0012	0.01	QV				
3+20	0.0012	0.01	QV				
3+25	0.0013	0.01	QV				
3+30	0.0013	0.01	QV				
3+35	0.0014	0.01	QV				
3+40	0.0014	0.01	QV				
3+45	0.0014	0.01	QV				
3+50	0.0015	0.01	QV				
3+55	0.0015	0.01	QV				
4+ 0	0.0015	0.01	QV				
4+ 5	0.0016	0.01	QV				
4+10	0.0016	0.01	QV				
4+15	0.0016	0.01	QV				
4+20	0.0017	0.01	QV				
4+25	0.0017	0.01	Q V				
4+30	0.0018	0.01	Q V				
4+35	0.0018	0.01	Q V				
4+40	0.0018	0.01	Q V				
4+45	0.0019	0.01	Q V				
4+50	0.0019	0.01	Q V				



4+55	0.0019	0.01	Q V				
5+ 0	0.0020	0.01	Q V				
5+ 5	0.0020	0.01	Q V				
5+10	0.0021	0.01	Q V				
5+15	0.0021	0.01	Q V				
5+20	0.0021	0.01	Q V				
5+25	0.0022	0.01	Q V				
5+30	0.0022	0.01	Q V				
5+35	0.0023	0.01	Q V				
5+40	0.0023	0.01	Q V				
5+45	0.0023	0.01	Q V				
5+50	0.0024	0.01	Q V				
5+55	0.0024	0.01	Q V				
6+ 0	0.0025	0.01	Q V				
6+ 5	0.0025	0.01	Q V				
6+10	0.0026	0.01	Q V				
6+15	0.0026	0.01	Q V				
6+20	0.0026	0.01	Q V				
6+25	0.0027	0.01	Q V				
6+30	0.0027	0.01	Q V				
6+35	0.0028	0.01	Q V				
6+40	0.0028	0.01	Q V				
6+45	0.0028	0.01	Q V				
6+50	0.0029	0.01	Q V				
6+55	0.0029	0.01	Q V				
7+ 0	0.0030	0.01	Q V				
7+ 5	0.0030	0.01	Q V				
7+10	0.0031	0.01	Q V				
7+15	0.0031	0.01	Q V				
7+20	0.0032	0.01	Q V				
7+25	0.0032	0.01	Q V				
7+30	0.0032	0.01	Q V				
7+35	0.0033	0.01	Q V				
7+40	0.0033	0.01	Q V				
7+45	0.0034	0.01	Q V				
7+50	0.0034	0.01	Q V				
7+55	0.0035	0.01	Q V				
8+ 0	0.0035	0.01	Q V				
8+ 5	0.0036	0.01	Q V				
8+10	0.0036	0.01	Q V				
8+15	0.0037	0.01	Q V				
8+20	0.0037	0.01	Q V				
8+25	0.0038	0.01	Q V				
8+30	0.0038	0.01	Q V				
8+35	0.0039	0.01	Q V				
8+40	0.0039	0.01	Q V				
8+45	0.0040	0.01	Q V				
8+50	0.0040	0.01	Q V				
8+55	0.0041	0.01	Q V				
9+ 0	0.0041	0.01	Q V				
9+ 5	0.0042	0.01	Q V				
9+10	0.0042	0.01	Q V				



9+15	0.0043	0.01	Q	V				
9+20	0.0043	0.01	Q	V				
9+25	0.0044	0.01	Q	V				
9+30	0.0044	0.01	Q	V				
9+35	0.0045	0.01	Q	V				
9+40	0.0045	0.01	Q	V				
9+45	0.0046	0.01	Q	V				
9+50	0.0047	0.01	Q	V				
9+55	0.0047	0.01	Q	V				
10+ 0	0.0048	0.01	Q	V				
10+ 5	0.0048	0.01	Q	V				
10+10	0.0049	0.01	Q	V				
10+15	0.0049	0.01	Q	V				
10+20	0.0050	0.01	Q	V				
10+25	0.0051	0.01	Q	V				
10+30	0.0051	0.01	Q	V				
10+35	0.0052	0.01	Q	V				
10+40	0.0052	0.01	Q	V				
10+45	0.0053	0.01	Q	V				
10+50	0.0054	0.01	Q	V				
10+55	0.0054	0.01	Q	V				
11+ 0	0.0055	0.01	Q	V				
11+ 5	0.0055	0.01	Q	V				
11+10	0.0056	0.01	Q	V				
11+15	0.0057	0.01	Q	V				
11+20	0.0057	0.01	Q	V				
11+25	0.0058	0.01	Q	V				
11+30	0.0059	0.01	Q	V				
11+35	0.0059	0.01	Q	V				
11+40	0.0060	0.01	Q	V				
11+45	0.0061	0.01	Q	V				
11+50	0.0062	0.01	Q	V				
11+55	0.0062	0.01	Q	V				
12+ 0	0.0063	0.01	Q	V				
12+ 5	0.0064	0.01	Q	V				
12+10	0.0064	0.01	Q	V				
12+15	0.0065	0.01	Q	V				
12+20	0.0065	0.01	Q	V				
12+25	0.0066	0.01	Q	V				
12+30	0.0067	0.01	Q	V				
12+35	0.0067	0.01	Q	V				
12+40	0.0068	0.01	Q	V				
12+45	0.0068	0.01	Q	V				
12+50	0.0069	0.01	Q	V				
12+55	0.0070	0.01	Q	V				
13+ 0	0.0070	0.01	Q	V				
13+ 5	0.0071	0.01	Q	V				
13+10	0.0072	0.01	Q	V				
13+15	0.0072	0.01	Q	V				
13+20	0.0073	0.01	Q	V				
13+25	0.0074	0.01	Q	V				
13+30	0.0074	0.01	Q	V				



13+35	0.0075	0.01	Q	V					
13+40	0.0076	0.01	Q	V					
13+45	0.0077	0.01	Q	V					
13+50	0.0077	0.01	Q	V					
13+55	0.0078	0.01	Q	V					
14+ 0	0.0079	0.01	Q	V					
14+ 5	0.0080	0.01	Q	V					
14+10	0.0081	0.01	Q	V					
14+15	0.0082	0.01	Q	V					
14+20	0.0083	0.01	Q	V					
14+25	0.0084	0.01	Q	V					
14+30	0.0085	0.01	Q	V					
14+35	0.0086	0.01	Q	V					
14+40	0.0087	0.02	Q	V					
14+45	0.0088	0.02	Q	V					
14+50	0.0089	0.02	Q	V					
14+55	0.0090	0.02	Q	V					
15+ 0	0.0091	0.02	Q	V					
15+ 5	0.0093	0.02	Q	V					
15+10	0.0094	0.02	Q	V					
15+15	0.0096	0.02	Q	V					
15+20	0.0097	0.02	Q	V					
15+25	0.0099	0.03	Q	V					
15+30	0.0101	0.03	Q	V					
15+35	0.0103	0.03	Q	V					
15+40	0.0106	0.04	Q	V					
15+45	0.0109	0.04	Q	V					
15+50	0.0113	0.05	Q	V					
15+55	0.0118	0.08	Q	V					
16+ 0	0.0128	0.14	Q	V					
16+ 5	0.0156	0.41	Q		V				
16+10	0.0204	0.70	Q			V			
16+15	0.0228	0.34	Q				V		
16+20	0.0243	0.21	Q				V		
16+25	0.0253	0.15	Q					V	
16+30	0.0261	0.11	Q					V	
16+35	0.0268	0.09	Q					V	
16+40	0.0273	0.08	Q					V	
16+45	0.0278	0.07	Q					V	
16+50	0.0282	0.06	Q					V	
16+55	0.0286	0.05	Q					V	
17+ 0	0.0289	0.05	Q					V	
17+ 5	0.0292	0.04	Q					V	
17+10	0.0294	0.04	Q					V	
17+15	0.0295	0.02	Q					V	
17+20	0.0296	0.01	Q					V	
17+25	0.0297	0.01	Q					V	
17+30	0.0298	0.01	Q					V	
17+35	0.0299	0.01	Q					V	
17+40	0.0300	0.01	Q					V	
17+45	0.0300	0.01	Q					V	
17+50	0.0301	0.01	Q					V	



17+55	0.0302	0.01	Q				V	
18+ 0	0.0302	0.01	Q				V	
18+ 5	0.0303	0.01	Q				V	
18+10	0.0304	0.01	Q				V	
18+15	0.0304	0.01	Q				V	
18+20	0.0305	0.01	Q				V	
18+25	0.0306	0.01	Q				V	
18+30	0.0306	0.01	Q				V	
18+35	0.0307	0.01	Q				V	
18+40	0.0308	0.01	Q				V	
18+45	0.0308	0.01	Q				V	
18+50	0.0309	0.01	Q				V	
18+55	0.0310	0.01	Q				V	
19+ 0	0.0310	0.01	Q				V	
19+ 5	0.0311	0.01	Q				V	
19+10	0.0311	0.01	Q				V	
19+15	0.0312	0.01	Q				V	
19+20	0.0313	0.01	Q				V	
19+25	0.0313	0.01	Q				V	
19+30	0.0314	0.01	Q				V	
19+35	0.0314	0.01	Q				V	
19+40	0.0315	0.01	Q				V	
19+45	0.0315	0.01	Q				V	
19+50	0.0316	0.01	Q				V	
19+55	0.0316	0.01	Q				V	
20+ 0	0.0317	0.01	Q				V	
20+ 5	0.0317	0.01	Q				V	
20+10	0.0318	0.01	Q				V	
20+15	0.0318	0.01	Q				V	
20+20	0.0319	0.01	Q				V	
20+25	0.0319	0.01	Q				V	
20+30	0.0320	0.01	Q				V	
20+35	0.0320	0.01	Q				V	
20+40	0.0321	0.01	Q				V	
20+45	0.0321	0.01	Q				V	
20+50	0.0322	0.01	Q				V	
20+55	0.0322	0.01	Q				V	
21+ 0	0.0322	0.01	Q				V	
21+ 5	0.0323	0.01	Q				V	
21+10	0.0323	0.01	Q				V	
21+15	0.0324	0.01	Q				V	
21+20	0.0324	0.01	Q				V	
21+25	0.0325	0.01	Q				V	
21+30	0.0325	0.01	Q				V	
21+35	0.0325	0.01	Q				V	
21+40	0.0326	0.01	Q				V	
21+45	0.0326	0.01	Q				V	
21+50	0.0327	0.01	Q				V	
21+55	0.0327	0.01	Q				V	
22+ 0	0.0327	0.01	Q				V	
22+ 5	0.0328	0.01	Q				V	
22+10	0.0328	0.01	Q				V	



22+15	0.0328	0.01	Q				∇
22+20	0.0329	0.01	Q				∇
22+25	0.0329	0.01	Q				∇
22+30	0.0330	0.01	Q				∇
22+35	0.0330	0.01	Q				∇
22+40	0.0330	0.01	Q				∇
22+45	0.0331	0.01	Q				∇
22+50	0.0331	0.01	Q				∇
22+55	0.0331	0.01	Q				∇
23+ 0	0.0332	0.01	Q				∇
23+ 5	0.0332	0.01	Q				∇
23+10	0.0332	0.00	Q				∇
23+15	0.0333	0.00	Q				∇
23+20	0.0333	0.00	Q				∇
23+25	0.0333	0.00	Q				∇
23+30	0.0334	0.00	Q				∇
23+35	0.0334	0.00	Q				∇
23+40	0.0334	0.00	Q				∇
23+45	0.0335	0.00	Q				∇
23+50	0.0335	0.00	Q				∇
23+55	0.0335	0.00	Q				∇
24+ 0	0.0336	0.00	Q				∇



Developed Condition: 100 year storm

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

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Study date 04/30/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6561

55975 29palm, Yucca Valley
100 year storm
Developed condition

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
0.16	1	1.89

Rainfall data for year 100		
0.16	6	3.04



Rainfall data for year 100

0.16 24 5.05

+++++

***** Area-averaged max loss rate, Fm *****

SCS curve No. (AMCII)	SCS curve NO. (AMC 2)	Area (Ac.)	Area Fraction	Fp (Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
40.8	40.8	0.16	1.000	0.909	0.325	0.295

Area-averaged adjusted loss rate Fm (In/Hr) = 0.295

***** Area-Averaged low loss rate fraction, Yb *****

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.05	0.325	40.8	40.8	14.51	0.055
0.11	0.675	98.0	98.0	0.20	0.953

Area-averaged catchment yield fraction, Y = 0.661

Area-averaged low loss fraction, Yb = 0.339

Direct entry of lag time by user

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Watershed area = 0.16 (Ac.)
 Catchment Lag time = 0.057 hours
 Unit interval = 5.000 minutes
 Unit interval percentage of lag time = 146.1988
 Hydrograph baseflow = 0.00 (CFS)
 Average maximum watershed loss rate (Fm) = 0.295 (In/Hr)
 Average low loss rate fraction (Yb) = 0.339 (decimal)
 MOUNTAIN S-Graph Selected
 Computed peak 5-minute rainfall = 0.897 (In)
 Computed peak 30-minute rainfall = 1.535 (In)
 Specified peak 1-hour rainfall = 1.890 (In)
 Computed peak 3-hour rainfall = 2.529 (In)
 Specified peak 6-hour rainfall = 3.040 (In)
 Specified peak 24-hour rainfall = 5.050 (In)

Rainfall depth area reduction factors:

Using a total area of 0.16 (Ac.) (Ref: fig. E-4)

5-minute factor = 1.000	Adjusted rainfall = 0.897 (In)
30-minute factor = 1.000	Adjusted rainfall = 1.535 (In)
1-hour factor = 1.000	Adjusted rainfall = 1.890 (In)
3-hour factor = 1.000	Adjusted rainfall = 2.529 (In)
6-hour factor = 1.000	Adjusted rainfall = 3.040 (In)
24-hour factor = 1.000	Adjusted rainfall = 5.050 (In)



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

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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
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(K = 1.93 (CFS))

1	33.294	0.644
2	70.932	0.728
3	82.833	0.230
4	89.162	0.122
5	93.444	0.083
6	96.471	0.059
7	100.000	0.029

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
------------------	-----------------------------	--------------------

1	0.8968	0.8968
2	1.1041	0.2073
3	1.2469	0.1428
4	1.3593	0.1124
5	1.4534	0.0941
6	1.5351	0.0817
7	1.6078	0.0727
8	1.6735	0.0657
9	1.7337	0.0602
10	1.7894	0.0557
11	1.8413	0.0519
12	1.8900	0.0487
13	1.9305	0.0406
14	1.9689	0.0383
15	2.0052	0.0364
16	2.0399	0.0346
17	2.0729	0.0331
18	2.1046	0.0317
19	2.1350	0.0304
20	2.1642	0.0292
21	2.1924	0.0282
22	2.2197	0.0272
23	2.2460	0.0263
24	2.2715	0.0255
25	2.2962	0.0247
26	2.3202	0.0240
27	2.3436	0.0233
28	2.3663	0.0227
29	2.3884	0.0221
30	2.4100	0.0216
31	2.4311	0.0211
32	2.4516	0.0206
33	2.4717	0.0201
34	2.4914	0.0197
35	2.5106	0.0192



36	2.5294	0.0188
37	2.5479	0.0185
38	2.5660	0.0181
39	2.5837	0.0177
40	2.6011	0.0174
41	2.6182	0.0171
42	2.6350	0.0168
43	2.6515	0.0165
44	2.6677	0.0162
45	2.6837	0.0160
46	2.6994	0.0157
47	2.7148	0.0154
48	2.7300	0.0152
49	2.7450	0.0150
50	2.7597	0.0147
51	2.7743	0.0145
52	2.7886	0.0143
53	2.8027	0.0141
54	2.8166	0.0139
55	2.8304	0.0137
56	2.8439	0.0136
57	2.8573	0.0134
58	2.8705	0.0132
59	2.8836	0.0130
60	2.8965	0.0129
61	2.9092	0.0127
62	2.9218	0.0126
63	2.9342	0.0124
64	2.9465	0.0123
65	2.9586	0.0121
66	2.9706	0.0120
67	2.9825	0.0119
68	2.9943	0.0117
69	3.0059	0.0116
70	3.0174	0.0115
71	3.0287	0.0114
72	3.0400	0.0113
73	3.0554	0.0154
74	3.0706	0.0153
75	3.0858	0.0151
76	3.1008	0.0150
77	3.1156	0.0149
78	3.1304	0.0148
79	3.1450	0.0146
80	3.1596	0.0145
81	3.1740	0.0144
82	3.1882	0.0143
83	3.2024	0.0142
84	3.2165	0.0141
85	3.2305	0.0140
86	3.2443	0.0139
87	3.2581	0.0138



88	3.2717	0.0137
89	3.2853	0.0136
90	3.2988	0.0135
91	3.3121	0.0134
92	3.3254	0.0133
93	3.3386	0.0132
94	3.3517	0.0131
95	3.3647	0.0130
96	3.3776	0.0129
97	3.3905	0.0128
98	3.4032	0.0128
99	3.4159	0.0127
100	3.4285	0.0126
101	3.4410	0.0125
102	3.4535	0.0124
103	3.4658	0.0124
104	3.4781	0.0123
105	3.4903	0.0122
106	3.5024	0.0121
107	3.5145	0.0121
108	3.5265	0.0120
109	3.5384	0.0119
110	3.5503	0.0119
111	3.5620	0.0118
112	3.5737	0.0117
113	3.5854	0.0116
114	3.5970	0.0116
115	3.6085	0.0115
116	3.6200	0.0115
117	3.6313	0.0114
118	3.6427	0.0113
119	3.6540	0.0113
120	3.6652	0.0112
121	3.6763	0.0112
122	3.6874	0.0111
123	3.6984	0.0110
124	3.7094	0.0110
125	3.7204	0.0109
126	3.7312	0.0109
127	3.7420	0.0108
128	3.7528	0.0108
129	3.7635	0.0107
130	3.7742	0.0107
131	3.7848	0.0106
132	3.7953	0.0106
133	3.8058	0.0105
134	3.8163	0.0105
135	3.8267	0.0104
136	3.8370	0.0104
137	3.8473	0.0103
138	3.8576	0.0103
139	3.8678	0.0102



140	3.8780	0.0102
141	3.8881	0.0101
142	3.8981	0.0101
143	3.9082	0.0100
144	3.9182	0.0100
145	3.9281	0.0099
146	3.9380	0.0099
147	3.9479	0.0099
148	3.9577	0.0098
149	3.9674	0.0098
150	3.9772	0.0097
151	3.9868	0.0097
152	3.9965	0.0096
153	4.0061	0.0096
154	4.0157	0.0096
155	4.0252	0.0095
156	4.0347	0.0095
157	4.0441	0.0094
158	4.0535	0.0094
159	4.0629	0.0094
160	4.0723	0.0093
161	4.0815	0.0093
162	4.0908	0.0093
163	4.1000	0.0092
164	4.1092	0.0092
165	4.1184	0.0092
166	4.1275	0.0091
167	4.1366	0.0091
168	4.1456	0.0091
169	4.1547	0.0090
170	4.1636	0.0090
171	4.1726	0.0090
172	4.1815	0.0089
173	4.1904	0.0089
174	4.1992	0.0089
175	4.2081	0.0088
176	4.2169	0.0088
177	4.2256	0.0088
178	4.2343	0.0087
179	4.2430	0.0087
180	4.2517	0.0087
181	4.2603	0.0086
182	4.2689	0.0086
183	4.2775	0.0086
184	4.2860	0.0085
185	4.2946	0.0085
186	4.3030	0.0085
187	4.3115	0.0085
188	4.3199	0.0084
189	4.3283	0.0084
190	4.3367	0.0084
191	4.3450	0.0083



192	4.3533	0.0083
193	4.3616	0.0083
194	4.3699	0.0083
195	4.3781	0.0082
196	4.3863	0.0082
197	4.3945	0.0082
198	4.4027	0.0082
199	4.4108	0.0081
200	4.4189	0.0081
201	4.4270	0.0081
202	4.4350	0.0081
203	4.4430	0.0080
204	4.4510	0.0080
205	4.4590	0.0080
206	4.4670	0.0080
207	4.4749	0.0079
208	4.4828	0.0079
209	4.4907	0.0079
210	4.4985	0.0079
211	4.5064	0.0078
212	4.5142	0.0078
213	4.5220	0.0078
214	4.5297	0.0078
215	4.5375	0.0077
216	4.5452	0.0077
217	4.5529	0.0077
218	4.5605	0.0077
219	4.5682	0.0076
220	4.5758	0.0076
221	4.5834	0.0076
222	4.5910	0.0076
223	4.5986	0.0076
224	4.6061	0.0075
225	4.6136	0.0075
226	4.6211	0.0075
227	4.6286	0.0075
228	4.6360	0.0075
229	4.6435	0.0074
230	4.6509	0.0074
231	4.6583	0.0074
232	4.6657	0.0074
233	4.6730	0.0074
234	4.6803	0.0073
235	4.6876	0.0073
236	4.6949	0.0073
237	4.7022	0.0073
238	4.7095	0.0073
239	4.7167	0.0072
240	4.7239	0.0072
241	4.7311	0.0072
242	4.7383	0.0072
243	4.7455	0.0072



244	4.7526	0.0071
245	4.7597	0.0071
246	4.7668	0.0071
247	4.7739	0.0071
248	4.7810	0.0071
249	4.7880	0.0070
250	4.7951	0.0070
251	4.8021	0.0070
252	4.8091	0.0070
253	4.8160	0.0070
254	4.8230	0.0070
255	4.8299	0.0069
256	4.8369	0.0069
257	4.8438	0.0069
258	4.8507	0.0069
259	4.8575	0.0069
260	4.8644	0.0069
261	4.8712	0.0068
262	4.8781	0.0068
263	4.8849	0.0068
264	4.8917	0.0068
265	4.8984	0.0068
266	4.9052	0.0068
267	4.9119	0.0067
268	4.9187	0.0067
269	4.9254	0.0067
270	4.9321	0.0067
271	4.9388	0.0067
272	4.9454	0.0067
273	4.9521	0.0066
274	4.9587	0.0066
275	4.9653	0.0066
276	4.9719	0.0066
277	4.9785	0.0066
278	4.9851	0.0066
279	4.9916	0.0066
280	4.9982	0.0065
281	5.0047	0.0065
282	5.0112	0.0065
283	5.0177	0.0065
284	5.0242	0.0065
285	5.0307	0.0065
286	5.0371	0.0065
287	5.0436	0.0064
288	5.0500	0.0064

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0064	0.0022	0.0042
2	0.0064	0.0022	0.0043



3	0.0065	0.0022	0.0043
4	0.0065	0.0022	0.0043
5	0.0065	0.0022	0.0043
6	0.0065	0.0022	0.0043
7	0.0066	0.0022	0.0043
8	0.0066	0.0022	0.0043
9	0.0066	0.0022	0.0044
10	0.0066	0.0022	0.0044
11	0.0066	0.0023	0.0044
12	0.0067	0.0023	0.0044
13	0.0067	0.0023	0.0044
14	0.0067	0.0023	0.0044
15	0.0067	0.0023	0.0045
16	0.0068	0.0023	0.0045
17	0.0068	0.0023	0.0045
18	0.0068	0.0023	0.0045
19	0.0068	0.0023	0.0045
20	0.0069	0.0023	0.0045
21	0.0069	0.0023	0.0046
22	0.0069	0.0023	0.0046
23	0.0069	0.0024	0.0046
24	0.0070	0.0024	0.0046
25	0.0070	0.0024	0.0046
26	0.0070	0.0024	0.0046
27	0.0070	0.0024	0.0047
28	0.0071	0.0024	0.0047
29	0.0071	0.0024	0.0047
30	0.0071	0.0024	0.0047
31	0.0072	0.0024	0.0047
32	0.0072	0.0024	0.0047
33	0.0072	0.0024	0.0048
34	0.0072	0.0025	0.0048
35	0.0073	0.0025	0.0048
36	0.0073	0.0025	0.0048
37	0.0073	0.0025	0.0048
38	0.0074	0.0025	0.0049
39	0.0074	0.0025	0.0049
40	0.0074	0.0025	0.0049
41	0.0075	0.0025	0.0049
42	0.0075	0.0025	0.0049
43	0.0075	0.0025	0.0050
44	0.0075	0.0026	0.0050
45	0.0076	0.0026	0.0050
46	0.0076	0.0026	0.0050
47	0.0076	0.0026	0.0051
48	0.0077	0.0026	0.0051
49	0.0077	0.0026	0.0051
50	0.0077	0.0026	0.0051
51	0.0078	0.0026	0.0051
52	0.0078	0.0026	0.0052
53	0.0079	0.0027	0.0052
54	0.0079	0.0027	0.0052



55	0.0079	0.0027	0.0052
56	0.0080	0.0027	0.0053
57	0.0080	0.0027	0.0053
58	0.0080	0.0027	0.0053
59	0.0081	0.0027	0.0053
60	0.0081	0.0027	0.0054
61	0.0082	0.0028	0.0054
62	0.0082	0.0028	0.0054
63	0.0082	0.0028	0.0054
64	0.0083	0.0028	0.0055
65	0.0083	0.0028	0.0055
66	0.0083	0.0028	0.0055
67	0.0084	0.0028	0.0056
68	0.0084	0.0029	0.0056
69	0.0085	0.0029	0.0056
70	0.0085	0.0029	0.0056
71	0.0086	0.0029	0.0057
72	0.0086	0.0029	0.0057
73	0.0087	0.0029	0.0057
74	0.0087	0.0029	0.0057
75	0.0088	0.0030	0.0058
76	0.0088	0.0030	0.0058
77	0.0089	0.0030	0.0059
78	0.0089	0.0030	0.0059
79	0.0090	0.0030	0.0059
80	0.0090	0.0030	0.0059
81	0.0091	0.0031	0.0060
82	0.0091	0.0031	0.0060
83	0.0092	0.0031	0.0061
84	0.0092	0.0031	0.0061
85	0.0093	0.0031	0.0061
86	0.0093	0.0032	0.0061
87	0.0094	0.0032	0.0062
88	0.0094	0.0032	0.0062
89	0.0095	0.0032	0.0063
90	0.0095	0.0032	0.0063
91	0.0096	0.0033	0.0064
92	0.0096	0.0033	0.0064
93	0.0097	0.0033	0.0064
94	0.0098	0.0033	0.0065
95	0.0099	0.0033	0.0065
96	0.0099	0.0034	0.0065
97	0.0100	0.0034	0.0066
98	0.0100	0.0034	0.0066
99	0.0101	0.0034	0.0067
100	0.0102	0.0034	0.0067
101	0.0103	0.0035	0.0068
102	0.0103	0.0035	0.0068
103	0.0104	0.0035	0.0069
104	0.0105	0.0035	0.0069
105	0.0106	0.0036	0.0070
106	0.0106	0.0036	0.0070



107	0.0107	0.0036	0.0071
108	0.0108	0.0036	0.0071
109	0.0109	0.0037	0.0072
110	0.0109	0.0037	0.0072
111	0.0110	0.0037	0.0073
112	0.0111	0.0038	0.0073
113	0.0112	0.0038	0.0074
114	0.0113	0.0038	0.0075
115	0.0114	0.0039	0.0075
116	0.0115	0.0039	0.0076
117	0.0116	0.0039	0.0077
118	0.0116	0.0039	0.0077
119	0.0118	0.0040	0.0078
120	0.0119	0.0040	0.0078
121	0.0120	0.0041	0.0079
122	0.0121	0.0041	0.0080
123	0.0122	0.0041	0.0081
124	0.0123	0.0042	0.0081
125	0.0124	0.0042	0.0082
126	0.0125	0.0042	0.0083
127	0.0127	0.0043	0.0084
128	0.0128	0.0043	0.0084
129	0.0129	0.0044	0.0085
130	0.0130	0.0044	0.0086
131	0.0132	0.0045	0.0087
132	0.0133	0.0045	0.0088
133	0.0135	0.0046	0.0089
134	0.0136	0.0046	0.0090
135	0.0138	0.0047	0.0091
136	0.0139	0.0047	0.0092
137	0.0141	0.0048	0.0093
138	0.0142	0.0048	0.0094
139	0.0144	0.0049	0.0095
140	0.0145	0.0049	0.0096
141	0.0148	0.0050	0.0098
142	0.0149	0.0050	0.0098
143	0.0151	0.0051	0.0100
144	0.0153	0.0052	0.0101
145	0.0113	0.0038	0.0074
146	0.0114	0.0039	0.0075
147	0.0116	0.0039	0.0077
148	0.0117	0.0040	0.0078
149	0.0120	0.0041	0.0079
150	0.0121	0.0041	0.0080
151	0.0124	0.0042	0.0082
152	0.0126	0.0043	0.0083
153	0.0129	0.0044	0.0085
154	0.0130	0.0044	0.0086
155	0.0134	0.0045	0.0088
156	0.0136	0.0046	0.0090
157	0.0139	0.0047	0.0092
158	0.0141	0.0048	0.0093



159	0.0145	0.0049	0.0096
160	0.0147	0.0050	0.0098
161	0.0152	0.0052	0.0101
162	0.0154	0.0052	0.0102
163	0.0160	0.0054	0.0105
164	0.0162	0.0055	0.0107
165	0.0168	0.0057	0.0111
166	0.0171	0.0058	0.0113
167	0.0177	0.0060	0.0117
168	0.0181	0.0061	0.0120
169	0.0188	0.0064	0.0125
170	0.0192	0.0065	0.0127
171	0.0201	0.0068	0.0133
172	0.0206	0.0070	0.0136
173	0.0216	0.0073	0.0143
174	0.0221	0.0075	0.0146
175	0.0233	0.0079	0.0154
176	0.0240	0.0081	0.0159
177	0.0255	0.0086	0.0169
178	0.0263	0.0089	0.0174
179	0.0282	0.0096	0.0186
180	0.0292	0.0099	0.0193
181	0.0317	0.0107	0.0209
182	0.0331	0.0112	0.0219
183	0.0364	0.0123	0.0240
184	0.0383	0.0130	0.0253
185	0.0487	0.0165	0.0322
186	0.0519	0.0176	0.0343
187	0.0602	0.0204	0.0398
188	0.0657	0.0223	0.0434
189	0.0817	0.0246	0.0571
190	0.0941	0.0246	0.0695
191	0.1428	0.0246	0.1182
192	0.2073	0.0246	0.1827
193	0.8968	0.0246	0.8722
194	0.1124	0.0246	0.0878
195	0.0727	0.0246	0.0480
196	0.0557	0.0189	0.0368
197	0.0406	0.0137	0.0268
198	0.0346	0.0117	0.0229
199	0.0304	0.0103	0.0201
200	0.0272	0.0092	0.0180
201	0.0247	0.0084	0.0164
202	0.0227	0.0077	0.0150
203	0.0211	0.0071	0.0139
204	0.0197	0.0067	0.0130
205	0.0185	0.0063	0.0122
206	0.0174	0.0059	0.0115
207	0.0165	0.0056	0.0109
208	0.0157	0.0053	0.0104
209	0.0150	0.0051	0.0099
210	0.0143	0.0049	0.0095



211	0.0137	0.0047	0.0091
212	0.0132	0.0045	0.0087
213	0.0127	0.0043	0.0084
214	0.0123	0.0042	0.0081
215	0.0119	0.0040	0.0079
216	0.0115	0.0039	0.0076
217	0.0154	0.0052	0.0102
218	0.0150	0.0051	0.0099
219	0.0146	0.0050	0.0097
220	0.0143	0.0048	0.0094
221	0.0140	0.0047	0.0092
222	0.0137	0.0046	0.0090
223	0.0134	0.0045	0.0088
224	0.0131	0.0044	0.0087
225	0.0128	0.0044	0.0085
226	0.0126	0.0043	0.0083
227	0.0124	0.0042	0.0082
228	0.0121	0.0041	0.0080
229	0.0119	0.0040	0.0079
230	0.0117	0.0040	0.0077
231	0.0115	0.0039	0.0076
232	0.0113	0.0038	0.0075
233	0.0112	0.0038	0.0074
234	0.0110	0.0037	0.0073
235	0.0108	0.0037	0.0071
236	0.0107	0.0036	0.0070
237	0.0105	0.0036	0.0069
238	0.0104	0.0035	0.0068
239	0.0102	0.0035	0.0068
240	0.0101	0.0034	0.0067
241	0.0099	0.0034	0.0066
242	0.0098	0.0033	0.0065
243	0.0097	0.0033	0.0064
244	0.0096	0.0032	0.0063
245	0.0094	0.0032	0.0062
246	0.0093	0.0032	0.0062
247	0.0092	0.0031	0.0061
248	0.0091	0.0031	0.0060
249	0.0090	0.0031	0.0060
250	0.0089	0.0030	0.0059
251	0.0088	0.0030	0.0058
252	0.0087	0.0030	0.0058
253	0.0086	0.0029	0.0057
254	0.0085	0.0029	0.0056
255	0.0085	0.0029	0.0056
256	0.0084	0.0028	0.0055
257	0.0083	0.0028	0.0055
258	0.0082	0.0028	0.0054
259	0.0081	0.0028	0.0054
260	0.0081	0.0027	0.0053
261	0.0080	0.0027	0.0053
262	0.0079	0.0027	0.0052



263	0.0078	0.0027	0.0052
264	0.0078	0.0026	0.0051
265	0.0077	0.0026	0.0051
266	0.0076	0.0026	0.0050
267	0.0076	0.0026	0.0050
268	0.0075	0.0025	0.0050
269	0.0074	0.0025	0.0049
270	0.0074	0.0025	0.0049
271	0.0073	0.0025	0.0048
272	0.0073	0.0025	0.0048
273	0.0072	0.0024	0.0048
274	0.0071	0.0024	0.0047
275	0.0071	0.0024	0.0047
276	0.0070	0.0024	0.0046
277	0.0070	0.0024	0.0046
278	0.0069	0.0023	0.0046
279	0.0069	0.0023	0.0045
280	0.0068	0.0023	0.0045
281	0.0068	0.0023	0.0045
282	0.0067	0.0023	0.0044
283	0.0067	0.0023	0.0044
284	0.0066	0.0022	0.0044
285	0.0066	0.0022	0.0044
286	0.0065	0.0022	0.0043
287	0.0065	0.0022	0.0043
288	0.0065	0.0022	0.0043

 Total soil rain loss = 1.34(In)
 Total effective rainfall = 3.71(In)
 Peak flow rate in flood hydrograph = 0.76(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

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



1+ 0	0.0006	0.01	Q				
1+ 5	0.0007	0.01	Q				
1+10	0.0007	0.01	Q				
1+15	0.0008	0.01	Q				
1+20	0.0008	0.01	Q				
1+25	0.0009	0.01	Q				
1+30	0.0010	0.01	Q				
1+35	0.0010	0.01	Q				
1+40	0.0011	0.01	Q				
1+45	0.0011	0.01	Q				
1+50	0.0012	0.01	Q				
1+55	0.0013	0.01	QV				
2+ 0	0.0013	0.01	QV				
2+ 5	0.0014	0.01	QV				
2+10	0.0014	0.01	QV				
2+15	0.0015	0.01	QV				
2+20	0.0016	0.01	QV				
2+25	0.0016	0.01	QV				
2+30	0.0017	0.01	QV				
2+35	0.0017	0.01	QV				
2+40	0.0018	0.01	QV				
2+45	0.0019	0.01	QV				
2+50	0.0019	0.01	QV				
2+55	0.0020	0.01	QV				
3+ 0	0.0020	0.01	QV				
3+ 5	0.0021	0.01	QV				
3+10	0.0022	0.01	QV				
3+15	0.0022	0.01	QV				
3+20	0.0023	0.01	QV				
3+25	0.0024	0.01	QV				
3+30	0.0024	0.01	Q V				
3+35	0.0025	0.01	Q V				
3+40	0.0026	0.01	Q V				
3+45	0.0026	0.01	Q V				
3+50	0.0027	0.01	Q V				
3+55	0.0028	0.01	Q V				
4+ 0	0.0028	0.01	Q V				
4+ 5	0.0029	0.01	Q V				
4+10	0.0030	0.01	Q V				
4+15	0.0030	0.01	Q V				
4+20	0.0031	0.01	Q V				
4+25	0.0032	0.01	Q V				
4+30	0.0032	0.01	Q V				
4+35	0.0033	0.01	Q V				
4+40	0.0034	0.01	Q V				
4+45	0.0034	0.01	Q V				
4+50	0.0035	0.01	Q V				
4+55	0.0036	0.01	Q V				
5+ 0	0.0036	0.01	Q V				
5+ 5	0.0037	0.01	Q V				
5+10	0.0038	0.01	Q V				
5+15	0.0038	0.01	Q V				



5+20	0.0039	0.01	Q	V				
5+25	0.0040	0.01	Q	V				
5+30	0.0041	0.01	Q	V				
5+35	0.0041	0.01	Q	V				
5+40	0.0042	0.01	Q	V				
5+45	0.0043	0.01	Q	V				
5+50	0.0043	0.01	Q	V				
5+55	0.0044	0.01	Q	V				
6+ 0	0.0045	0.01	Q	V				
6+ 5	0.0046	0.01	Q	V				
6+10	0.0046	0.01	Q	V				
6+15	0.0047	0.01	Q	V				
6+20	0.0048	0.01	Q	V				
6+25	0.0049	0.01	Q	V				
6+30	0.0049	0.01	Q	V				
6+35	0.0050	0.01	Q	V				
6+40	0.0051	0.01	Q	V				
6+45	0.0052	0.01	Q	V				
6+50	0.0053	0.01	Q	V				
6+55	0.0053	0.01	Q	V				
7+ 0	0.0054	0.01	Q	V				
7+ 5	0.0055	0.01	Q	V				
7+10	0.0056	0.01	Q	V				
7+15	0.0057	0.01	Q	V				
7+20	0.0057	0.01	Q	V				
7+25	0.0058	0.01	Q	V				
7+30	0.0059	0.01	Q	V				
7+35	0.0060	0.01	Q	V				
7+40	0.0061	0.01	Q	V				
7+45	0.0061	0.01	Q	V				
7+50	0.0062	0.01	Q	V				
7+55	0.0063	0.01	Q	V				
8+ 0	0.0064	0.01	Q	V				
8+ 5	0.0065	0.01	Q	V				
8+10	0.0066	0.01	Q	V				
8+15	0.0067	0.01	Q	V				
8+20	0.0067	0.01	Q	V				
8+25	0.0068	0.01	Q	V				
8+30	0.0069	0.01	Q	V				
8+35	0.0070	0.01	Q	V				
8+40	0.0071	0.01	Q	V				
8+45	0.0072	0.01	Q	V				
8+50	0.0073	0.01	Q	V				
8+55	0.0074	0.01	Q	V				
9+ 0	0.0075	0.01	Q	V				
9+ 5	0.0076	0.01	Q	V				
9+10	0.0076	0.01	Q	V				
9+15	0.0077	0.01	Q	V				
9+20	0.0078	0.01	Q	V				
9+25	0.0079	0.01	Q	V				
9+30	0.0080	0.01	Q	V				
9+35	0.0081	0.01	Q	V				



9+40	0.0082	0.01	Q	V				
9+45	0.0083	0.01	Q	V				
9+50	0.0084	0.01	Q	V				
9+55	0.0085	0.01	Q	V				
10+ 0	0.0086	0.01	Q	V				
10+ 5	0.0087	0.01	Q	V				
10+10	0.0088	0.01	Q	V				
10+15	0.0089	0.02	Q	V				
10+20	0.0090	0.02	Q	V				
10+25	0.0091	0.02	Q	V				
10+30	0.0093	0.02	Q	V				
10+35	0.0094	0.02	Q	V				
10+40	0.0095	0.02	Q	V				
10+45	0.0096	0.02	Q	V				
10+50	0.0097	0.02	Q	V				
10+55	0.0098	0.02	Q	V				
11+ 0	0.0099	0.02	Q	V				
11+ 5	0.0100	0.02	Q	V				
11+10	0.0101	0.02	Q	V				
11+15	0.0103	0.02	Q	V				
11+20	0.0104	0.02	Q	V				
11+25	0.0105	0.02	Q	V				
11+30	0.0106	0.02	Q	V				
11+35	0.0107	0.02	Q	V				
11+40	0.0109	0.02	Q	V				
11+45	0.0110	0.02	Q	V				
11+50	0.0111	0.02	Q	V				
11+55	0.0113	0.02	Q	V				
12+ 0	0.0114	0.02	Q	V				
12+ 5	0.0115	0.02	Q	V				
12+10	0.0116	0.02	Q	V				
12+15	0.0117	0.02	Q	V				
12+20	0.0118	0.01	Q	V				
12+25	0.0119	0.01	Q	V				
12+30	0.0120	0.02	Q	V				
12+35	0.0121	0.02	Q	V				
12+40	0.0122	0.02	Q	V				
12+45	0.0123	0.02	Q	V				
12+50	0.0124	0.02	Q	V				
12+55	0.0126	0.02	Q	V				
13+ 0	0.0127	0.02	Q	V				
13+ 5	0.0128	0.02	Q	V				
13+10	0.0129	0.02	Q	V				
13+15	0.0130	0.02	Q	V				
13+20	0.0132	0.02	Q	V				
13+25	0.0133	0.02	Q	V				
13+30	0.0134	0.02	Q	V				
13+35	0.0136	0.02	Q	V				
13+40	0.0137	0.02	Q	V				
13+45	0.0138	0.02	Q	V				
13+50	0.0140	0.02	Q	V				
13+55	0.0141	0.02	Q	V				



14+ 0	0.0143	0.02	Q	V			
14+ 5	0.0144	0.02	Q	V			
14+10	0.0146	0.02	Q	V			
14+15	0.0148	0.02	Q	V			
14+20	0.0149	0.02	Q	V			
14+25	0.0151	0.03	Q	V			
14+30	0.0153	0.03	Q	V			
14+35	0.0155	0.03	Q	V			
14+40	0.0157	0.03	Q	V			
14+45	0.0159	0.03	Q	V			
14+50	0.0161	0.03	Q	V			
14+55	0.0163	0.03	Q	V			
15+ 0	0.0166	0.03	Q	V			
15+ 5	0.0168	0.04	Q	V			
15+10	0.0171	0.04	Q	V			
15+15	0.0174	0.04	Q	V			
15+20	0.0177	0.04	Q	V			
15+25	0.0180	0.05	Q	V			
15+30	0.0184	0.06	Q	V			
15+35	0.0189	0.07	Q	V			
15+40	0.0194	0.07	Q	V			
15+45	0.0200	0.09	Q	V			
15+50	0.0207	0.11	Q	V			
15+55	0.0218	0.15	Q	V			
16+ 0	0.0234	0.23	Q	V			
16+ 5	0.0285	0.74	Q		V		
16+10	0.0337	0.76	Q			V	
16+15	0.0360	0.33	Q			V	
16+20	0.0374	0.21	Q			V	
16+25	0.0385	0.15	Q				V
16+30	0.0392	0.11	Q				V
16+35	0.0398	0.07	Q				V
16+40	0.0401	0.04	Q				V
16+45	0.0403	0.04	Q				V
16+50	0.0405	0.03	Q				V
16+55	0.0407	0.03	Q				V
17+ 0	0.0409	0.03	Q				V
17+ 5	0.0411	0.03	Q				V
17+10	0.0413	0.02	Q				V
17+15	0.0414	0.02	Q				V
17+20	0.0416	0.02	Q				V
17+25	0.0417	0.02	Q				V
17+30	0.0418	0.02	Q				V
17+35	0.0420	0.02	Q				V
17+40	0.0421	0.02	Q				V
17+45	0.0422	0.02	Q				V
17+50	0.0423	0.02	Q				V
17+55	0.0424	0.02	Q				V
18+ 0	0.0425	0.02	Q				V
18+ 5	0.0426	0.02	Q				V
18+10	0.0428	0.02	Q				V
18+15	0.0429	0.02	Q				V



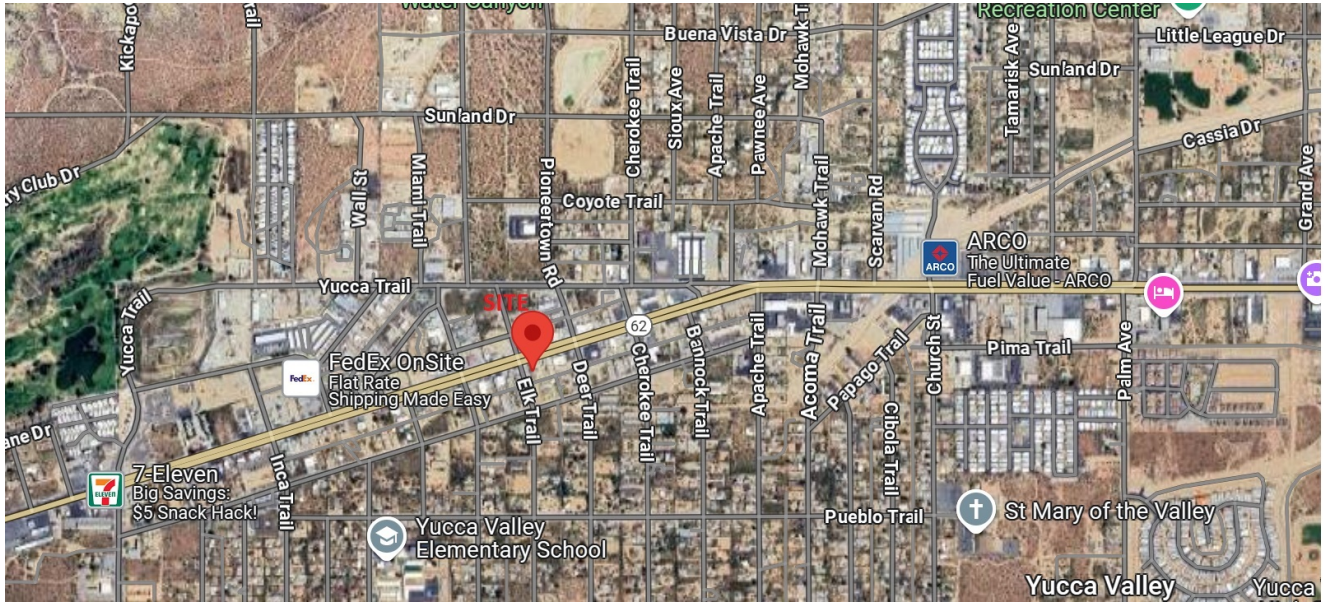
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18+35	0.0434	0.02	Q				V	
18+40	0.0435	0.02	Q				V	
18+45	0.0436	0.02	Q				V	
18+50	0.0437	0.02	Q				V	
18+55	0.0438	0.02	Q				V	
19+ 0	0.0439	0.02	Q				V	
19+ 5	0.0440	0.02	Q				V	
19+10	0.0441	0.02	Q				V	
19+15	0.0442	0.01	Q				V	
19+20	0.0443	0.01	Q				V	
19+25	0.0444	0.01	Q				V	
19+30	0.0445	0.01	Q				V	
19+35	0.0446	0.01	Q				V	
19+40	0.0447	0.01	Q				V	
19+45	0.0448	0.01	Q				V	
19+50	0.0449	0.01	Q				V	
19+55	0.0450	0.01	Q				V	
20+ 0	0.0451	0.01	Q				V	
20+ 5	0.0452	0.01	Q				V	
20+10	0.0453	0.01	Q				V	
20+15	0.0453	0.01	Q				V	
20+20	0.0454	0.01	Q				V	
20+25	0.0455	0.01	Q				V	
20+30	0.0456	0.01	Q				V	
20+35	0.0457	0.01	Q				V	
20+40	0.0458	0.01	Q				V	
20+45	0.0458	0.01	Q				V	
20+50	0.0459	0.01	Q				V	
20+55	0.0460	0.01	Q				V	
21+ 0	0.0461	0.01	Q				V	
21+ 5	0.0461	0.01	Q				V	
21+10	0.0462	0.01	Q				V	
21+15	0.0463	0.01	Q				V	
21+20	0.0464	0.01	Q				V	
21+25	0.0464	0.01	Q				V	
21+30	0.0465	0.01	Q				V	
21+35	0.0466	0.01	Q				V	
21+40	0.0466	0.01	Q				V	
21+45	0.0467	0.01	Q				V	
21+50	0.0468	0.01	Q				V	
21+55	0.0469	0.01	Q				V	
22+ 0	0.0469	0.01	Q				V	
22+ 5	0.0470	0.01	Q				V	
22+10	0.0471	0.01	Q				V	
22+15	0.0471	0.01	Q				V	
22+20	0.0472	0.01	Q				V	
22+25	0.0473	0.01	Q				V	
22+30	0.0473	0.01	Q				V	
22+35	0.0474	0.01	Q				V	



22+40	0.0474	0.01	Q				∇
22+45	0.0475	0.01	Q				∇
22+50	0.0476	0.01	Q				∇
22+55	0.0476	0.01	Q				∇
23+ 0	0.0477	0.01	Q				∇
23+ 5	0.0478	0.01	Q				∇
23+10	0.0478	0.01	Q				∇
23+15	0.0479	0.01	Q				∇
23+20	0.0479	0.01	Q				∇
23+25	0.0480	0.01	Q				∇
23+30	0.0480	0.01	Q				∇
23+35	0.0481	0.01	Q				∇
23+40	0.0482	0.01	Q				∇
23+45	0.0482	0.01	Q				∇
23+50	0.0483	0.01	Q				∇
23+55	0.0483	0.01	Q				∇
24+ 0	0.0484	0.01	Q				∇



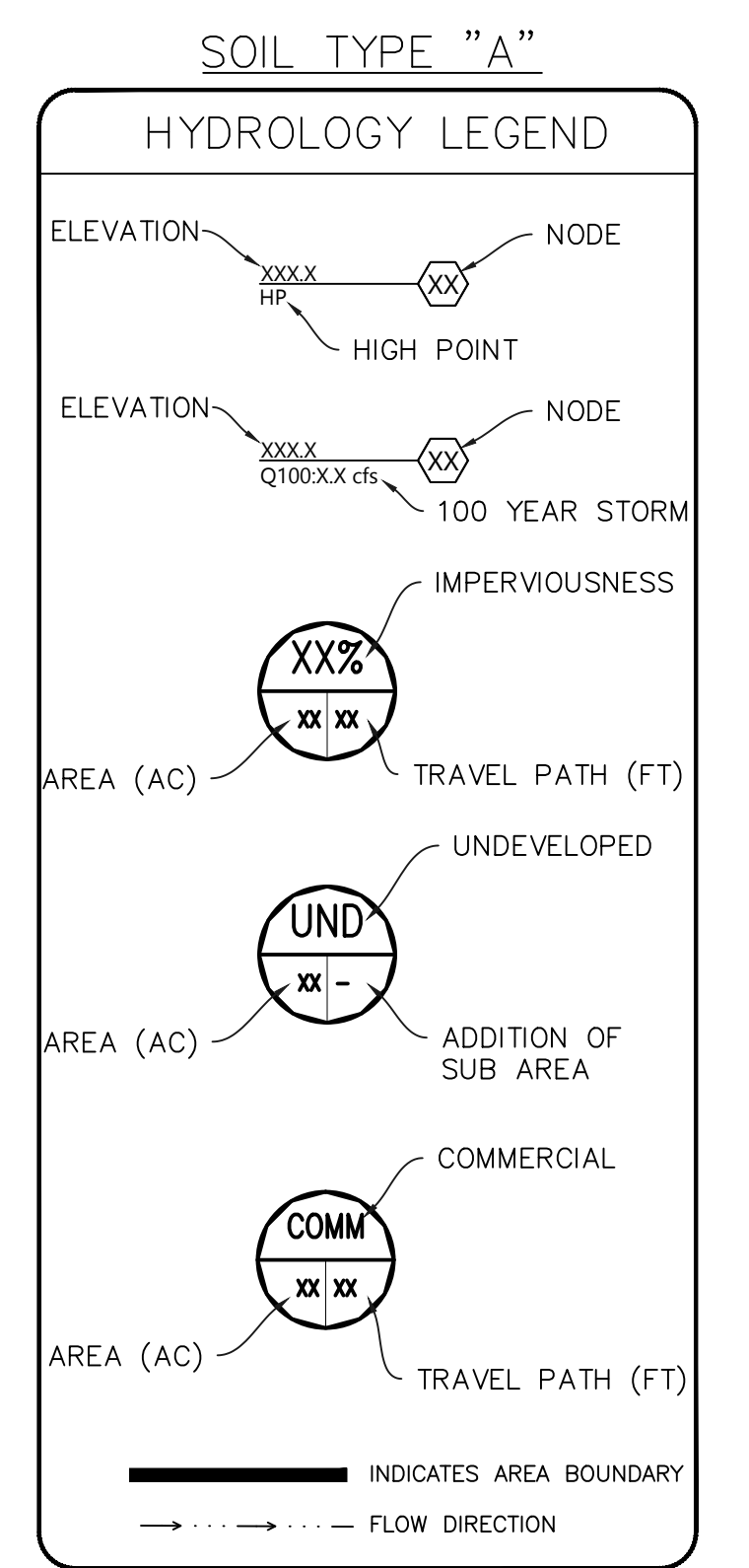
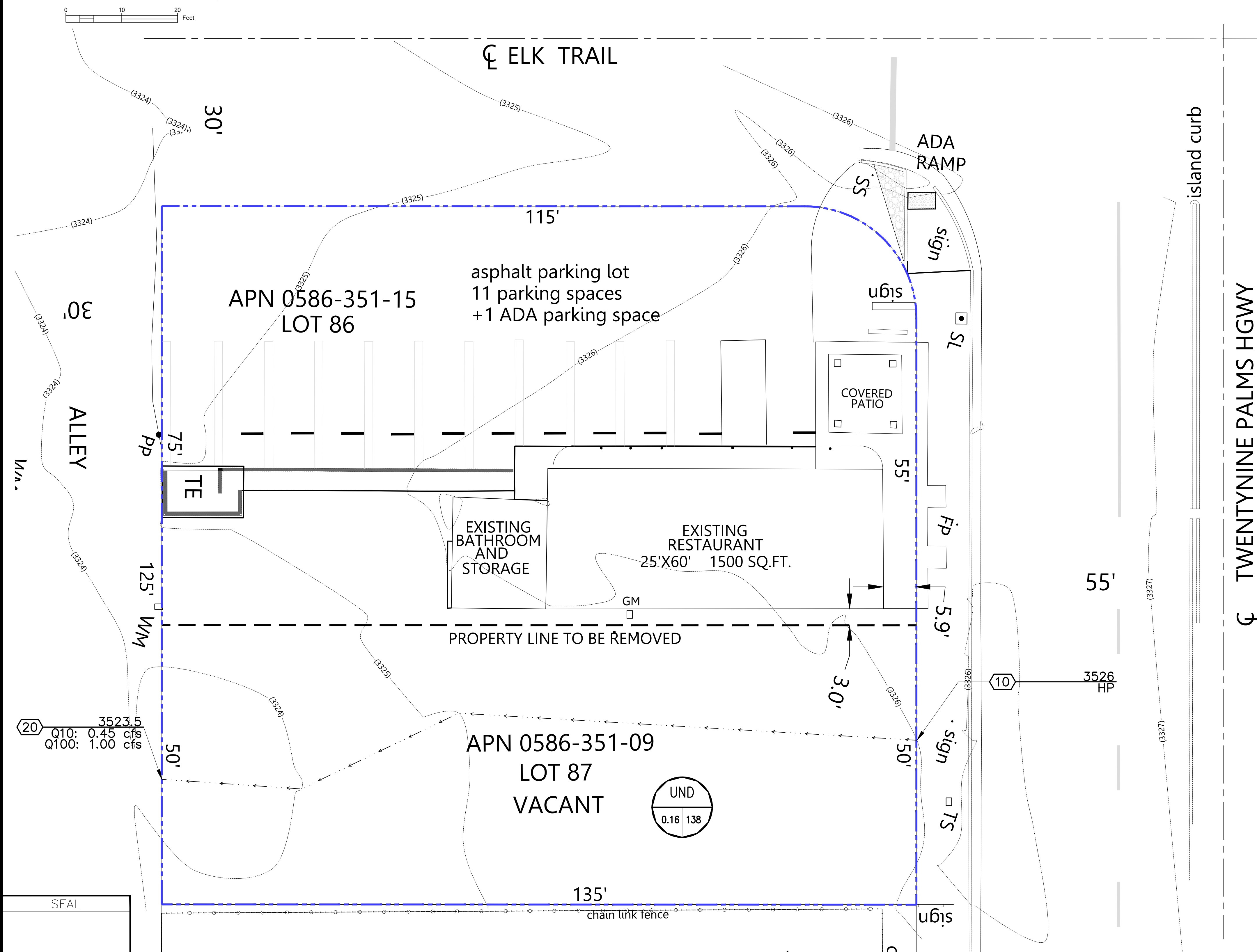
Hydrology exhibits



PRELIMINARY HYDROLOGY EXHIBIT

PRE-DEVELOPED CONDITION

55795 29 Palms Hwy , YV 92284



ABBREVIATION

- CL.....CENTER LINE
- FF.....FINISH FLOOR ELEVATION
- FG.....FINISH GRADE
- FL.....FLOW LINE ELEVATION
- HP.....HIGH POINT ELEVATION
- INV.....INVERT ELEVATIONS
- MAX.....MAXIMUM
- MIN.....MINIMUM
- NG.....NATURAL GROUND
- PE.....PAD ELEVATION
- PL.....PROPERTY LINE
- TCH.....TOP OF CHANNEL
- TG.....TOP OF GRATE ELEVATION
- S/W.....SIDEWALK
- P/A.....PLANTER AREA
- LS.....LANDSCAPE AREA
- AC.....ASPHALT CONCRETE
- C/B.....CATCH BASIN
- CBW.....CONC. BLOCK WALL
- CONC.....CONCRETE
- DS.....DOWNSPOUT

LEGEND

- PROPERTY LINE
- CENTER LINE
- PROPOSED CONTOUR
- EXISTING CONTOUR
- EARTH SWALE
- PCC CONCRETE
- EXISTING ASPHALT
- EXISTING HYDRANT
- EXISTING TREE
- EXISTING MANHOLE
- EXISTING EOP
- EXISTING CURB
- EXISTING IRON FENCE
- EXIST. CHAINLINK FENCE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- DIRECTION OF FLOW
- EXISTING WATER VALVE
- EXISTING WATER METER
- PROPOSED WALL FENCE
- PROPOSED WATER METER

BENCHMARK No.:

SEAL

Don't Dig Until You Call USA Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. THREE WORKING DAYS BEFORE YOU DIG

REVISIONS					
MARK	DATE	INITIAL	DESCRIPTION	DATE	APP'VD

PLANS PREPARED BY:

FUTRONO ENGINEERING
 1430 E COOLEY DR. OFFICE 120 COLTON, CA. 92324
 TEL: (909) 212-4874
 EMAIL: edmundo@futronoengineering.com

PREPARED UNDER THE SUPERVISION OF:
JESS C. SOTTO 06-17-25
 RCE. No. 83381 DATE



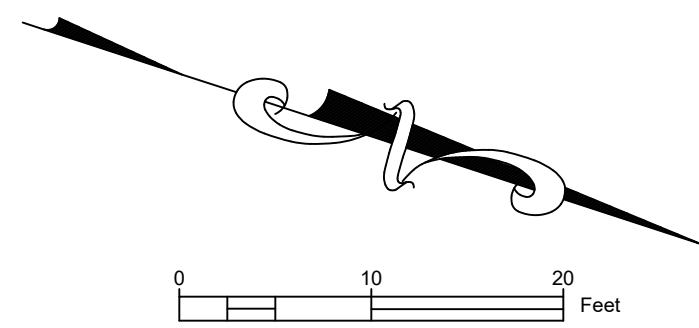
TOWN OF YUCCA VALLEY
 COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
PRE DEVELOPED HYDROLOGY CONDITION
 APN: 0586-351-16

SHEET
1
 OF 2 SHEETS
 DRAWING NO.
 00000-0000000.00

PRELIMINARY HYDROLOGY EXHIBIT

DEVELOPED CONDITION

55795 29 Palms Hwy , YV 92284



ELK TRAIL

ALLEY

30'

APN 0586-351-15
LOT 86

asphalt parking lot
11 parking spaces
+1 ADA parking space

ADA RAMP

island curb

115'

COVERED PATIO

TS

EXISTING BATHROOM AND STORAGE

EXISTING RESTAURANT
25'X60' 1500 SQ.FT.

55'

TWENTYNINE PALMS HGWY

55'

COMM
0.02 54

COMM
0.10 -

COMM
0.015 95

50'

TS

20

3333
Q10: 0.13cfs
Q100: 0.26cfs

25

3326
Q10: 0.13cfs
Q100: 0.26cfs

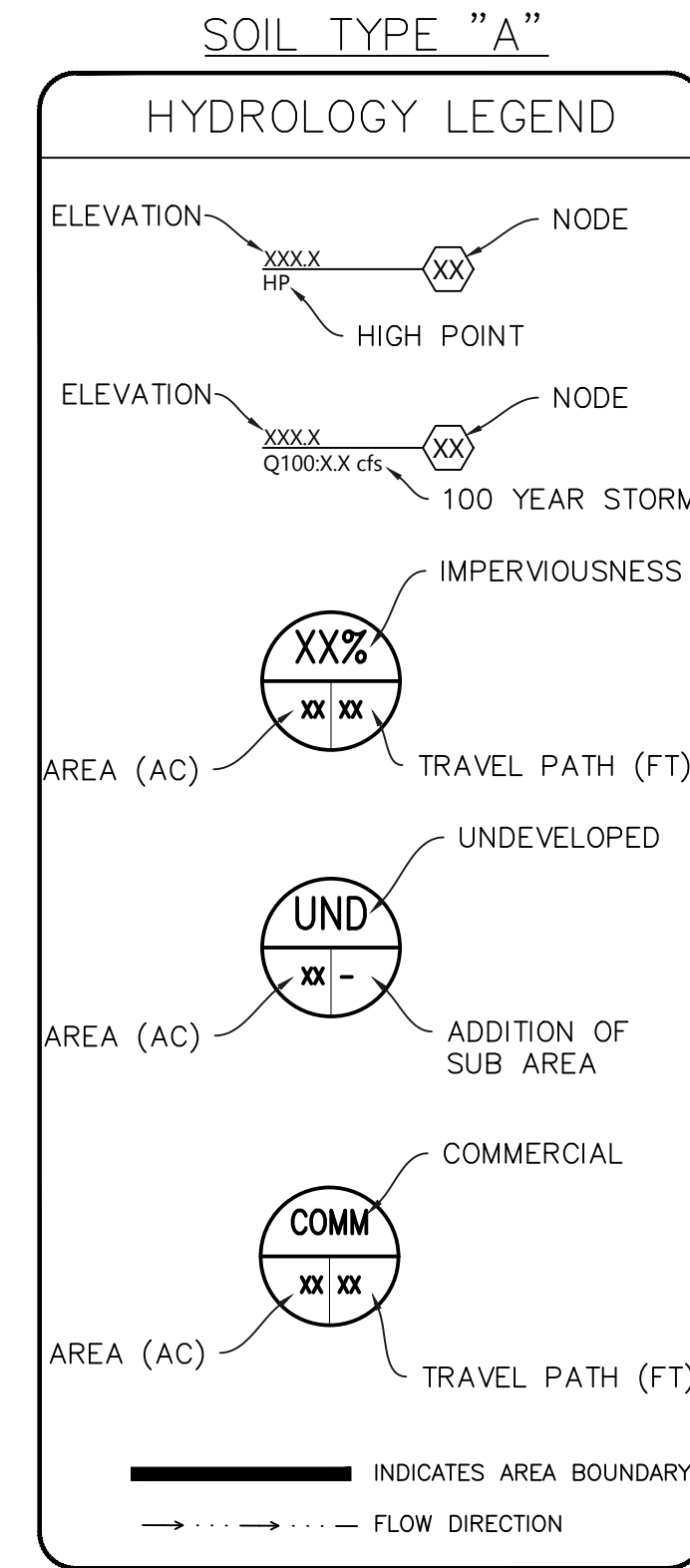
10

3324.5
Q10: 0.70cfs
Q100: 1.48cfs

40

3323.6
Q10: 0.80 cfs
Q100: 1.70 cfs

3324.5
Q10: 0.70cfs
Q100: 1.48cfs



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C/B	CATCH BASIN
CBW	CONC. BLOCK WALL
CONC.	CONCRETE
DS	DOWNSPOUT

LEGEND

---	PROPERTY LINE	---	EXISTING IRON FENCE
⊕	CENTER LINE	---	EXIST. CHAINLINK FENCE
100	PROPOSED CONTOUR	---	EXISTING SEWER LINE
(99)	EXISTING CONTOUR	---	EXISTING WATER LINE
---	EARTH SWALE	→	DIRECTION OF FLOW
[Pattern]	PCC CONCRETE	⊕	EXISTING WATER VALVE
[Pattern]	EXISTING ASPHALT	□	EXISTING WATER METER
⊕	EXISTING HYDRANT	---	PROPOSED WALL FENCE
⊕	EXISTING TREE	[Pattern]	PROPOSED WATER METER
⊕	EXISTING MANHOLE		
---	EXISTING EOP		
---	EXISTING CURB		

BENCHMARK No.:

Don't Dig Until You Call USA Toll Free
1-800-227-2600
for the location of buried utility lines.
Don't disrupt vital services.
THREE WORKING DAYS BEFORE YOU DIG

REVISIONS					
MARK	DATE	INITIAL	DESCRIPTION	DATE	APP'D

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TOWN OF YUCCA VALLEY
COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
DEVELOPED HYDROLOGY CONDITION
APN: 0586-351-16

SHEET
2
OF 2 SHEETS
DRAWING NO.
00000-0000000.00