# APPENDIX H1

# DRAINGE REPORT

ALLARD ENGINEERING
civil engineering land surveying land planning

# Conco Commercial
# 13052 Dahlia Street
# Fontana, CA 92337

# Preliminary Drainage Report

**June 20, 2023**

**Prepared For:**
**The Conco Companies**
**5141 Commercial Circle**
**Concord, CA 94520**
**Tel.: (925) 685-6799**

**Prepared By:**
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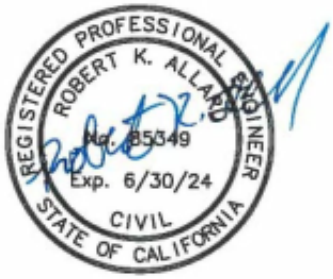
**16866 Seville Avenue**
**Fontana, CA 92335**
**(909) 356-1815**

**Prepared under the supervision of:**




Robert Allard

Robert K Allard, P.E. RCE 85349 Exp. 06-30-24

# Discussion

## *Introduction*

This report is for the proposed re-development of an existing commercial site located in the City of Fontana at 13052 Dahlia Street which is approximately 7.8 acres. This site is currently used as developed with existing building, parking area and concrete pads covering 1/3 of the site area, 2/3 of the site area is compacted gravel paved in existing condition.

The current runoff, which occurs during storm events drains southwest on the existing surface and discharges into the street gutter in Dahlia Street which is tributary to the San Sevaine Channel. In developed condition the site will drain to the proposed Infiltration Chamber System and existing drywell system for low flow (WQMP water volume) infiltration and the Detention Chamber will be used for high flow detention and mitigation of the peak runoff from 100-yr, 25-yr, 10-yr & 5-yr storm event. The mitigated runoff flows will drain to the proposed bubbler catch basin in the driveway at the southwest corner of the site and will overflow and drain to the street through an under sidewalk drain.

## *Purpose*

The purpose of this Preliminary Drainage Report is to assess the existing and future flows that affect the site and provide necessary onsite drainage facilities to safely convey the mitigated peak flow generated from the proposed development into the Dahlia Street via surface flow which will ultimately conveys to the City storm drain system (Existing catch basin and 30"/52" RCP) in Etiwanda Avenue, west of the proposed site.

The purpose of this Drainage Report is to quantify the developed condition runoff and show that the proposed drainage system is adequate to detain the water volume and drain the mitigated runoff flow into the Dahlia Street which ultimately drains to the San Sevaine Channel.

## *Criteria*

The criteria utilized for hydrologic analysis is the San Bernardino County Hydrology Manual and Detention Basin Policy. Rational Method Hydrology was used to quantify flow rates (Developed and Existing condition), CivilDesign software to quantify detention volume (Unit Hydrograph Method) and Flood Routing of the Detention Chamber to mitigate outflow rate. Also, WSPG was utilize to run water surface pressure-gradient analysis of the proposed 18" outflow line from detention chamber system. AES software was used to size the proposed storm drain and swales/valley gutters to carry the flow onsite.

## *Findings*

The proposed development will consist of building structures, trucking docks, parking lot, driveways, sidewalks, paved area and landscape/planters. The overall existing site condition is considered 60% pervious with pre-existing commercial buildings and paved gravel area.

In developed condition we have estimated the proposed development (Commercial/Industrial land use) will create impervious areas which is about 90% overall of the site.

The primary drainage solution for the site will be an underground chamber detention system. This detention chamber system (CMP-2) has an 18" outlet pipe that will discharge into the proposed bubbler catch basin in driveway at the southwest corner of the site. The detention chamber system (CMP-2) will mitigate the developed runoff to less than 90% of the existing runoff flow rate. This onsite detention system (CMP-2) will consist of 5ft diameter perforated CMP system (with 4-barrels) located upstream in the west driveway/parking area.

We calculated the runoff flowrate and runoff volume for 100-yr, 25-yr, 10-yr, & 5-yr storm events. Largest Increase in runoff volume and runoff flow rate generated in 100-yr storm event due to the proposed development from its existing condition.

Please see below table for the output of the hydrology analysis for 100-yr, 25-yr, 10-yr, 5-yr storm events in existing and developed condition.

**SUMMARY OF RUNOFF FLOW CALCULATION: CALABASH INDUSTRIAL**

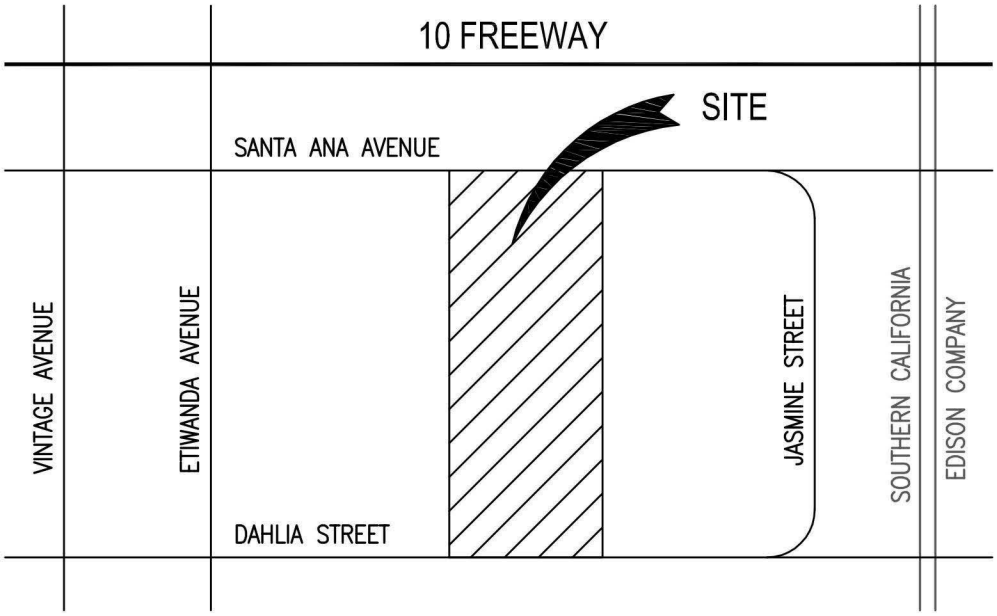
| Storm Event | Site (Area: 7.8 ac) | Peak Runoff Rate (CFS) | Reqd Mitg. Runoff Rate (CFS) | Mitg. Runoff Rate via Detention System Routing |
|---|---|---|---|---|
| 100-yr, 1-hr | Developed Condition | 23.0 | | 8.3 CFS < 10.3 CFS |
| | | | | |
| 100-yr, 1-hr | Existing Condition | 11.5 | 10.3 (90% of 11.5) | |
| | | | | |
| | | | | |
| 25-yr, 1-hr | Developed Condition | 17.7 | | 5.8 CFS < 7.7 CFS |
| | | | | |
| 25-yr, 1-hr | Existing Condition | 8.5 | 7.7 (90% of 8.5) | |
| | | | | |
| | | | | |
| 10-yr, 1-hr | Developed Condition | 14.4 | | 4.1 CFS < 5.8 CFS |
| | | | | |
| 10-yr, 1-hr | Existing Condition | 6.4 | 5.8 (90% of 6.4) | |
| | | | | |
| | | | | |
| 5-yr, 1-hr | Developed Condition | 11.9 | | 3.3 CFS < 3.4 CFS |
| | | | | |
| 5-yr, 1-hr | Existing Condition | 3.8 | 3.4 (90% of 3.8) | |
| | | | | |

Higher up in the proposed sites watershed are WQMP infiltration basin to treat the water and the overflow will be the drive isles that will convey larger runoff to the said detention system. Ultimately the mitigated runoff will drain down Dahlia Street which will drain to City Storm Drain System in Etiwanda Avenue and then drain to San Sevaine Channel.

There are no offsite tributary areas that drain through the property in existing/developed condition. The proposed developed site is consistent with drainage pattern in the area.

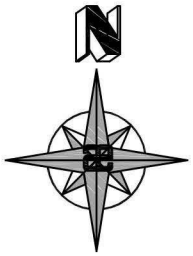
Calculations and exhibits are attached to support these findings.

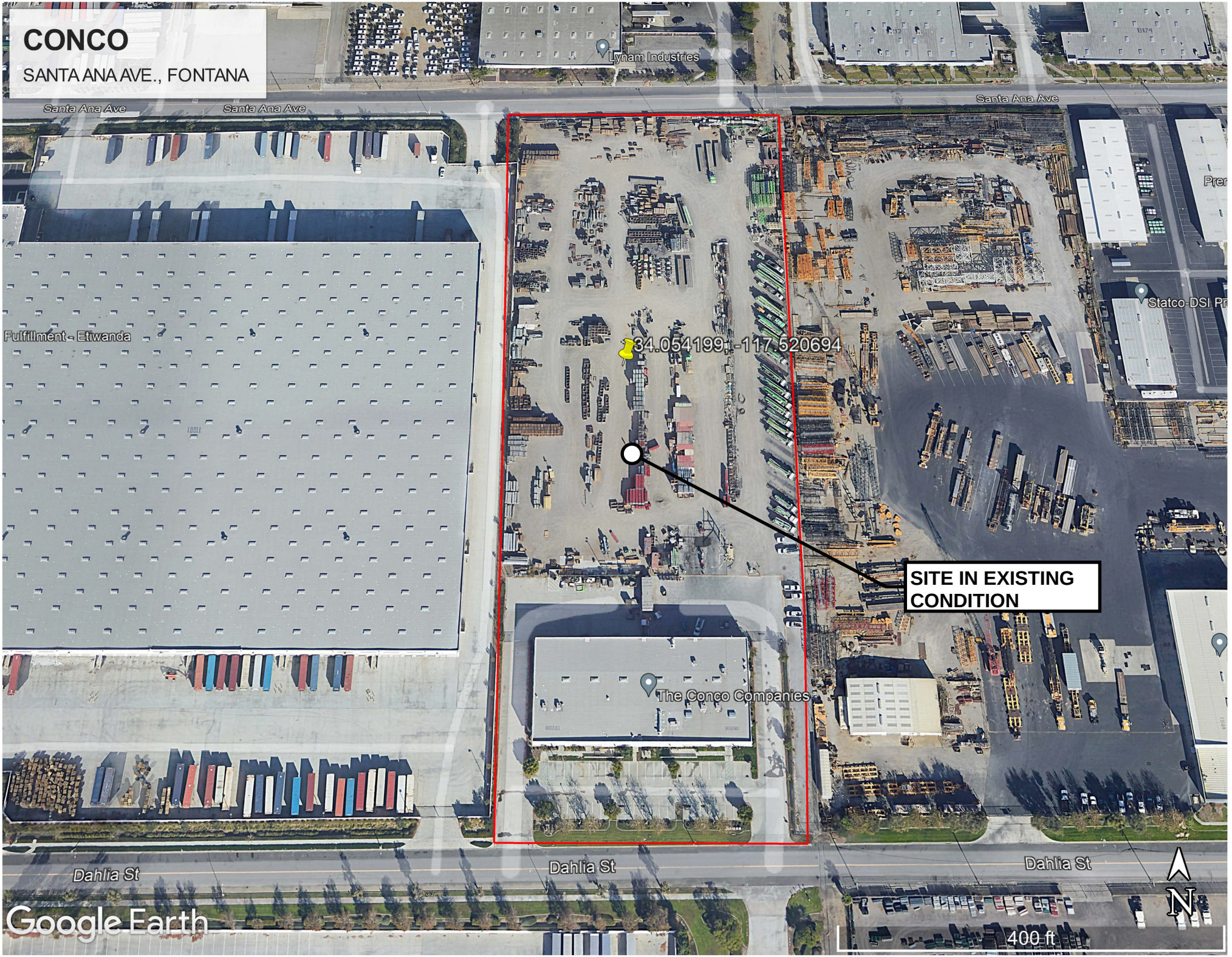
# Reference Materials

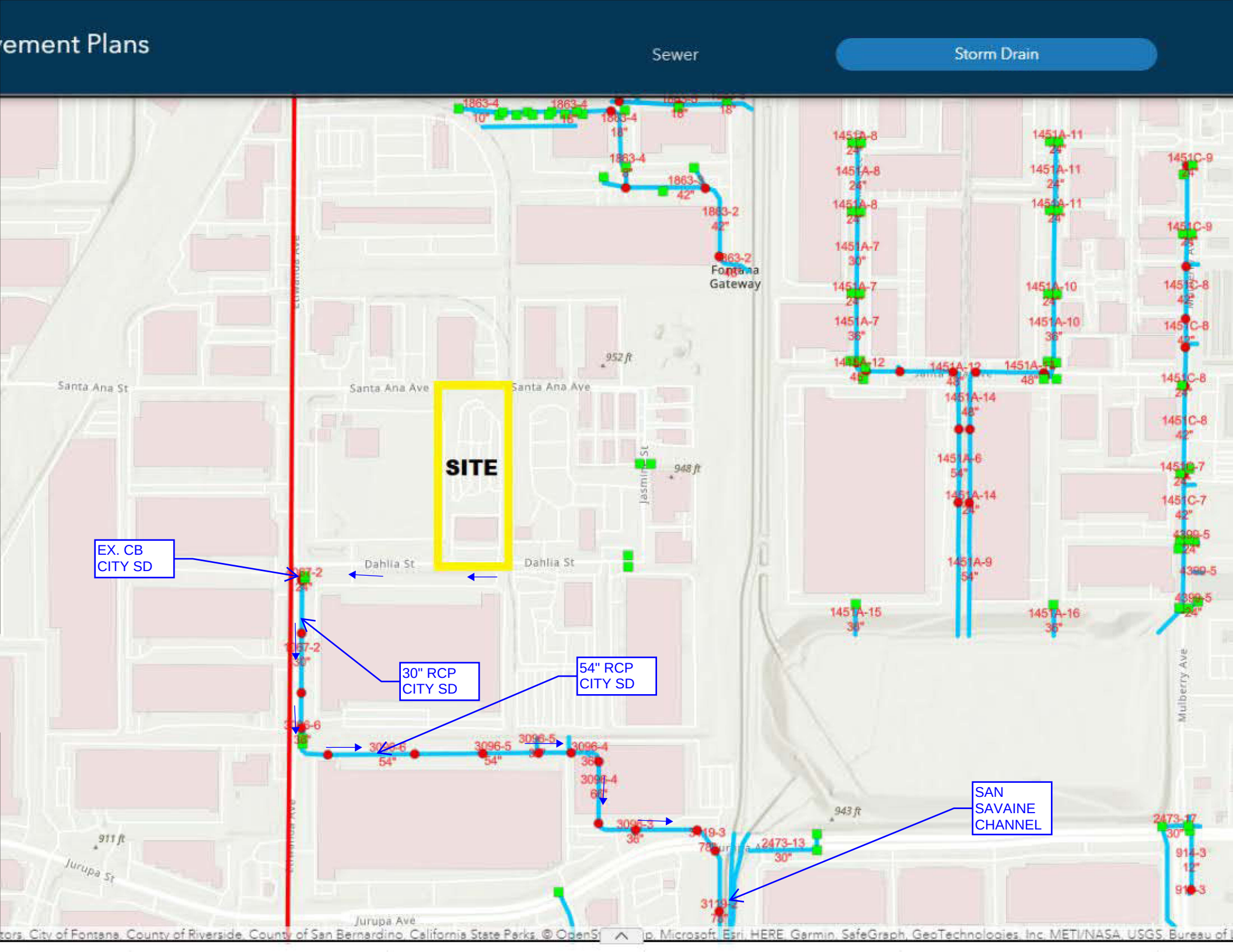


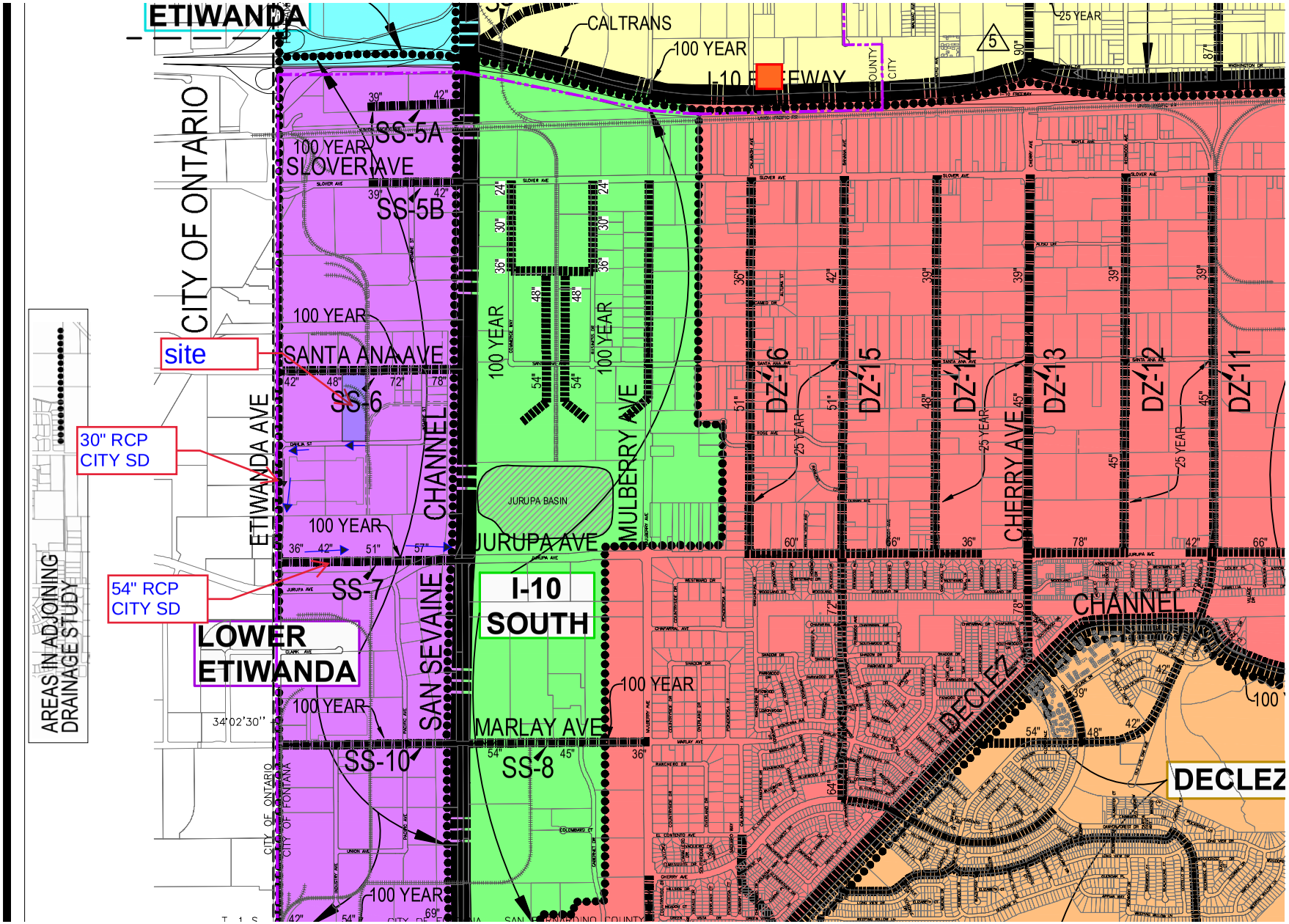

VICINITY MAP

NTS




CONCO
SANTA ANA AVE., FONTANA
Santa Ana Ave
Santa Ana Ave
Santa Ana Ave
Lynam Industries
Fulfillment - Etiwanda
34.054199, -117.520694
SITE IN EXISTING CONDITION
The Conco Companies
Statco-DSI
Dahlia St
Dahlia St
Dahlia St
Google Earth
400 ft
N


ement Plans
Sewer
Storm Drain
SITE
EX. CB
CITY SD
30" RCP
CITY SD
54" RCP
CITY SD
SAN
SAVAINE
CHANNEL
Santa Ana St
Santa Ana Ave
Dahlia St
Jurupa St
Jurupa Ave
Mulberry Ave
Fontana
Gateway
952 ft
948 ft
943 ft
911 ft


ETIWANDA
CALTRANS
100 YEAR
I-10 FREEWAY
25 YEAR
CITY OF ONTARIO
SS-5A
SS-5B
100 YEAR
SLOVER AVE
site
SANTA ANA AVE
SS-6
ETIWANDA AVE
CHANNEL
30" RCP
CITY SD
54" RCP
CITY SD
AREAS IN ADJOINING
DRAINAGE STUDY
JURUPA BASIN
JURUPA AVE
SS-7
LOWER
ETIWANDA
SAN SEVAINE
I-10
SOUTH
MULBERRY AVE
DZ-16
DZ-15
DZ-14
DZ-13
DZ-12
DZ-11
CHERRY AVE
CHANNEL
DECLEZ
MARLAY AVE
SS-8
SS-10
CITY OF FONTANA
34°02'30"

930 CL

930 RT

PROPOSED FINISH SURFACE @ CENTERLINE

TAN= 2.56%

VC 50.00'
VPI=927.01

SEE SHEET 2 FOR CURB RETURN

TOP OF EXISTING 8" CURB @ 22' RT

12+92.25 BOR (928.68'TC) (928.02'FL) JOIN EXIST.

13+42.25 C/L 40' D/W 928.27'FL

13+92.26 EOR (929.18'TC) (928.52'FL) JOIN EXIST.

12+84.21 (928.70')TC

13+22.24 PI 928.17'FL

13+62.26 PI 928.37'FL

11+03.05 EOR 927.45'TC 926.78'FL

11+00.72 (927.43')TC

11+97.23 (928.25')TC

10+93.97 BOR 927.79'TC, 927.12'FL JOIN EXISTING

10+34.50 (927.15')FS JOIN EXISTING

10+00.00 DAHLIA STREET = 69+16.62 ETIWANDA AVENUE

10+14.17 (928.11')FS

10+47.66 (926.70')FS

10+58.00 BVC 926.39'FS

10+83.00 MVC 926.91'FS

11+08.00 EVC (927.22')FS

12+00.00 (938.02')FS

12+00.00 (939.50')FS

12+00.00 (939.00')FS

12+00.00 (939.46')FS

12+00.00 (940.46')FS

12+00.00 (940.95')FS

12+00.00 (941.43')FS

12+00.00 (941.92')FS

12+00.00 (942.41')FS

12+00.00 (943.24')FS

12+00.00 (943.40')FS

22+49.74 END PAVEMENT MATCH EXIST.

22+50.25 (934.56')FS

22+70.25 (934.65')FS

PROPOSED PAVEMENT TO MATCH EXISTING FS @ C/L

150' EXIST. C.F. TRANSITION 8" - 0" C.F.

14+83.14 (925.35')TC

15+82.13 (930.08')TC

16+78.95 (930.97')TC

17+75.53 (931.04')TC

18+67.43 (931.45')TC

19+62.16 (931.89')TC

20+59.17 (932.37')TC

21+55.61 (932.82')TC

21+60.71 BOR (932.28'TC) (932.34'FL) JOIN EXIST.

21+99.74 C/L 40' D/W 932.79'FL

22+49.74 EOR (933.32'TC) (933.24'FL) JOIN EXIST.

22+69.67 (933.33')TC

22+70.17 (933.32')TC

21+60.02 PI 932.59'FL

22+20.04 PI 932.99'FL

TOP OF EXISTING 8" CURB @ 22' RT

EXISTING FL 8" C.F.

PROFILE SCALES
HORIZ: 1" = 40'
VERT: 1" = 4'

11 12 13 14 15 16 17 18 19 20 21 22 23

SCALE: 1"= 40'

SITE

APN: 0238-112-17

APN: 0238-112-16

APN: 0238-112-07

APN: 0238-112-32

FUTURE ST. LT.

LINE OF SIGHT L=300', MPH=40

LIMITED USE AREA (NOTHING HIGHER THAN 30" ALLOWED)

N89°27'25"E

℄ DAHLIA STREET

EXIST. STREET LIGHT

EXIST. SEWER

EXIST. CURB & GUTTER

EXIST. R/W

PROPOSED R/W

GUY WIRE

PP

FH

WV

EXIST. UTILITY EASEMENT

UTILITY EASEMENT

CAUTION! EXISTING WATER

68+46.00 BCR 926.10'TC, 925.43'FL

11+03.05 EOR 927.45'TC, 926.78'FL MEET EXISTING

12+92.25 MEET EXISTING

13+42.25 C/L 40' DRIVEWAY

13+92.26 MEET EXISTING

16+32

19+71

21+49.73 JOIN EXISTING

21+99.74 C/L 40' DRIVEWAY

22+49.74 ANG. PT

22+49.74 MEET EXISTING

933.05'TC 0'CF

933.15'FL

933.22'TC 6'CF

933.45'TC 6'CF

933.32'TC (933.32'TC) (933.24'FL) 1'C.F.

933.34'TC 0'CF

934.48'FL

934.58'FS

5.4'C.F. (932.79'TC) (932.34'FL)

R.R. SIGNAL

ELEC. BOX

ELEC. METER

50'

EXIST. RAILROAD EASEMENT

SEE DETAIL ON SHEET 4.

ETIWANDA AVENUE
SEE SHEET 2

EX. CB

EX. 30" RCP CITY SD

## CONSTRUCTION NOTES:

(2) CONSTRUCT 5.5" MIN. ASPHALT CONCRETE PAVEMENT OVER 95% COMPACTED SUBGRADE

(4) ADJUST TO GRADE AS NEEDED PER CITY OF FONTANA STD. PLAN NO. 130.

(6) CONSTRUCT CONC. DRIVEWAY (WIDTH PER PLAN) PER CITY OF FONTANA STD. PLAN NO. 1005A.

(7) CONSTRUCT 6' CONCRETE SIDEWALK PER CITY OF FONTANA STD. PLAN NO. 1015.

(12) SAW CUT EXISTING CONCRETE CURB, GUTTER, AND/OR AC PAVEMENT.

(13) REMOVE EXISTING CONCRETE CURB, GUTTER AND/OR AC PAVEMENT.

(16) PROTECT IN PLACE; ITEM SPECIFIED ON PLAN.

(17) EXISTING POLE TO BE REMOVED AND LINES UNDERGROUNDED AS REQUIRED BY UTILITY.

(18) PROPOSED STREET LIGHT; SEE STREET LIGHT IMPROVEMENT PLANS FOR DETAILS

### CURVE DATA

| CURVE | RADIUS | DELTA | LENGTH | TANGENT |
|---|---|---|---|---|
| 1 | 50.00 | 89°14'00" | 77.87 | 49.34 |
| 2 | 30.00 | 90°46'00" | 47.53 | 30.40 |
| 3 | 30.00 | 89°14'00" | 46.72 | 29.60 |
| 4 | 25.00 | 89°14'00" | 38.94 | 24.67 |

### EXISTING PLAN REFERENCE

| PLAN | DRAWING NO. |
|---|---|
| STREET | CO. STD. ACP-90 |
| STORM DRAIN | CITY STD. 3096 |
| SEWER | CITY STDS. 1545 & 1678 |
| WATER | FONTANA WATER CO. ATLAS |
| GAS | GAS CO. ATLAS |

### PAVING LEGEND

(1) OR (2)

(3) NOT USED 1

(13)

# DAHLIA STREET

STA10+00 TO STA 23+00

0 20 40 80 120 160

SCALE: 1 INCH = 40 FEET

REGISTERED PROFESSIONAL ENGINEER — TERESITO N. TABIOLO No. 38826 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

RECORD DRAWING 2

Teresito Tabiolo 2-22-08
TERESITO TABIOLO DATE
RCE 38826, EXP. 3-31-09

**NOTE:**
RAILROAD APPROVAL REQUIRED PRIOR TO CONSTRUCTION WITHIN THE RAILROAD EASEMENT.

BENCH MARK:
TOP OF 3/4" I.P. WEST 1/4 COR. SECTION 28 T.1S, R.6W. AT THE INTERSECTION OF ETIWANDA AVE. AND SANTA ANA STREET.
ELEVATION 941.95

BASIS OF BEARINGS:
BASIS OF BEARING IS THE CENTERLINE OF DAHLIA STREET AS SHOWN BY TRACT MAP NO. 8554, ON FILE IN BOOK 123 OF MAPS, PAGES 13 THROUGH 17, THEREOF, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, BEING N89°27'25"E.

Underground Service Alert
Call: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG

| REV. | REVISION DESCRIPTION | DATE | ENGR. | CITY | DATE |
|---|---|---|---|---|---|
| 2 | RECORD DRAWING | 2-22-08 | JJ | PW | 2/3/08 |
| 1 | DELETED OVERLAY; REVISED DRIVEWAY AT 21+99.74 | 10/25/06 | JJ | PW | 11-9-06 |

SHOULD CONSTRUCTION OF THE REQUIRED IMPROVEMENTS NOT COMMENCE WITHIN TWO YEARS OF THE DATE OF APPROVAL SHOWN HEREON AND CARRIED FORTH IN A DILIGENT MANNER, THE CITY ENGINEER MAY REQUIRE REVISIONS TO THE PLANS TO BRING THEM INTO CONFORMANCE WITH CONDITIONS AND STANDARDS IN EFFECT.

REGISTERED PROFESSIONAL ENGINEER — TERESITO N. TABIOLO RCE No. 38826 Exp. 3-31-07 CIVIL STATE OF CALIFORNIA


KCT CONSULTANTS, INC.
Civil Engineers - Surveyors - Planners
P.O. Box 5705 Riverside, CA 92517-5705
4344 Latham St., Suite 200, Riverside, CA 92501
Phone: 951-341-8940 Fax: 951-341-8945
e-mail: kctinc@kctconsultants.com


Prepared Under The Supervision Of : Date 10-25-06

TERESITO N. TABIOLO R.C.E. 38826 EXP. 03-31-07

W.O.: 1335-02

CITY OF FONTANA, CALIFORNIA
STREET IMPROVEMENT PLANS

DAHLIA STREET
FROM ETIWANDA AVENUE TO ±1300' EAST OF ETIWANDA AVENUE

| DRAWN BY: | ND | SCALE: | 1"=40' |
|---|---|---|---|
| DESIGNED BY: | RC | DATE: | 04/12/06 |
| CHECKED BY: | TT | DWG. NO.: | 4066 |
| APPROVED BY: | CITY ENGINEER | R.C.E. 51152 | DATE 11-9-06 | SHEET | 3/4 |

ETIWANDA AVE.

56+25.66 C/L M.H.=
10+00.00 LAT A-12
RIM=925.5

68+24.50 C/L CB
925.88TC
W=21'; V=5.68'

HGL100

WS ELEV.
=924.5

920 LAT

S=0.0100

HYD. DATA
Q100=26.3CFS
V100=5.4FPS

10+02.95
920.05 INV
30" RCP

10+17.68
920.05 INV
30" RCP

INSTALL 14.73 L.F.
OF 30" R.C.P. (D-1500)

LATERAL A-12

920

910

EXISTING FINISHED
SURFACE

EXIST. LAT. A-10- 36" RCP
(307.32INV)

47+32.73 EXISTING
JUNCTION STRUCTURE

47+43.54 C/L M.H.
RIM=915.4

CAUTION!!!
SEWER CROSSING

1

47+60
10" WAT.
911.3 BOT.

18"

HGL100

S=0.0412

47+43.54
906.09INV

47+38.87
906.59INV

EXISTING 54" RCP
PER DWG. NO. 3096

JOIN EXISTING

48+50.00 GRADE BREAK
911.08INV
CONCRETE COLLAR
PER APWA 380-3

1.0'
CLR

S=0.0050

929.88
TOP

PROP. 6" SEWER
LATERAL

HYD. DATA
Q100=43.9CFS
V100=13.2FPS

INSTALL 203.63 L.F. OF 30" R.C.P. (D-1500)

49+50.00 C/L M.H.
RIM=918.1

49+47.17
911.57INV

48+51.83 GB
911.59INV

PROPOSED FINISHED
SURFACE @ C/L OF S.D.

HGL100

S=0.0105

HYD. DATA
Q100=43.9CFS
V100=8.9FPS

EXISTING 24" VCP SEWER
PER DWG. NO. 1678

INSTALL 345.34 L.F. OF 30" R.C.P. (D-1500)

53+00.00 C/L M.H.
RIM=922.0

52+97.17
915.22INV

53+01.83 GB
915.27INV

HGL100

S=0.0110

HYD. DATA
Q100=43.9CFS
V100=8.9FPS

EXISTING 24" VCP SEWER
PER DWG. NO. 1678

INSTALL 305.57 L.F. OF 30" R.C.P. (D-1500)

LAT. A-11- 24" RCP
919.88 INV

LAT. A-12- 30" RCP
920.05 INV

56+10.23 C/L M.H.
RIM=925.3

56+25.68 C/L M.H.
RIM=925.5

56+07.40
916.63INV

56+12.06
916.68INV

56+22.82
916.80INV

930

EXISTING FINISHED
SURFACE

920

HYD. DATA
Q100=26.3CFS
V100=5.4FPS

INSTALL 10.76 L.F.
OF 30" R.C.P. (D-1500)

INSTALL 14.73 L.F.
OF 24" R.C.P. (D-1500)

56+10.23 C/L M.H.=
10+00.00 LAT A-11
RIM=930.0

56+25.68 C/L CB
925.68TC
W=14'; V=5.65'

WS ELEV.
=924.1

HGL100

920 LAT

S=0.0100

HYD. DATA
Q100=17.6CFS
V100=5.6FPS

10+02.95
919.98 INV
24" RCP

10+17.68
919.98 INV
24" RCP

LATERAL A-11

PROFILE SCALES
HORIZ: 1" = 40'
VERT: 1" = 4'

LINE "A" STORM DRAIN

46 47 48 49 50 51 52 53 54 55 56 57

SCALE: 1" = 40'

APN: 0238-101-65

APN: 0238-101-64

APN: 0238-081-51

SECTION LINE

SECTION 29
SECTION 28

CAUTION!!!
GTE MO
PROTECT IN PLACE

CITY OF ONTARIO
CITY OF FONTANA

℄ ETIWANDA AVENUE

LATERAL A-12 30"SD
N45°13'25"E 14.73'
PROFILE THIS SHEET

69+16.62 ETIWANDA AVENUE
=10+00.00 DAHLIA STREET

EXIST LINE 'A' 54" SD
REFER TO STORM DRAIN
DRAWING NO. 3096

EXIST. 14' CB

EXIST. 28' CB

EXIST. 42" INLET
TO BE REMOVED

(47+32.73) EXISTING JUNCTION STRUCTURE
REFER TO STORM DRAIN DRAWING NO. 3096

47+43.54 C/L M.H.
REMOVE 5' CENTRAL BULKHEAD
CONNECT TO EXISTING 54" PIPE

PROPOSED 6" SEWER

CAUTION!!!
SEWER CROSSING

EXIST CURB
& GUTTER

208.80'

N00°13'25"E

350.00'

EXIST SEWER

EXIST GAS

EXIST WATER

310.23'

15.43'

EXIST PP TO BE REMOVED

PROPOSED CURB & GUTTER

PROPOSED STORM DRAIN
SEE ONSITE STORM DRAIN
PLANS FOR CONSTRUCTION

PROPOSED R/W

C/L LINE "A"
STORM DRAIN

LATERAL A-11 24"SD
N45°13'25"E 14.73'
PROFILE THIS SHEET

EXIST PP AND GUY
TO BE REMOVED

EXIST F.H.

APN: 0238-112-49

APN: 0238-111-30

APN: 0238-112-17

EXIST P/L

DAHLIA STREET

SITE

* CONTRACTOR TO VERIFY LOCATION AND ELEVATION PRIOR TO CONSTRUCTION.

## STORM DRAIN CONSTRUCTION NOTES:

1. CONSTRUCT 30" RCP D-1500; INSTALLATION & BEDDING PER DETAIL ON SHT. 1.
2. CONSTRUCT 24" RCP D-1500; INSTALLATION & BEDDING PER DETAIL ON SHT. 1.
3. CONSTRUCT CONCRETE CATCH BASIN PER APWA STD. PLAN NO. 300-2; W & V PER PLAN.
4. CONSTRUCT STORM DRAIN MANHOLE PER APWA STANDARD DRAWING NO. 320-1. MODIFIED PER DETAIL ON SHT. 2.
5. CONSTRUCT STORM DRAIN MANHOLE PER APWA STANDARD DRAWING NO. 321-1.

EXIST 54" S.D.

PROP. 30" RCP
STORM DRAIN

36" M.H. SHAFT

47+38.87
906.59INV
JOIN EXIST.

47+43.54
906.09INV

SECTION VIEW

M.H. SHAFT

PROP. 30" RCP
STORM DRAIN

NORTH ELEVATION

# LINE "A" STORM DRAIN

STA 47+38.87 TO STA 56+27.83

0 20 40 80 120 160

SCALE: 1 INCH = 40 FEET

## 1 STA. 47+43.54

MODIFIED APWA M.H. STANDARD DETAIL NO. 320-1
1" = 4'

REGISTERED PROFESSIONAL ENGINEER
TERESITO N. TABIOLO
No. 38826
Exp. 3-31-09
CIVIL
STATE OF CALIFORNIA

RECORD DRAWING 2

Teresito Tabiolo 2-28-08
TERESITO TABIOLO DATE
RCE 38826, EXP. 3-31-09

BENCH MARK:
TOP OF 3/4" I.P. WEST 1/4 COR. SECTION 28 T1S, R.6W. AT THE INTERSECTION OF ETIWANDA AVE. AND SANTA ANA STREET.
ELEVATION 941.95

BASIS OF BEARINGS:
BASIS OF BEARING IS THE CENTERLINE OF DAHLIA STREET AS SHOWN BY TRACT MAP NO. 8554, ON FILE IN BOOK 123 OF MAPS, PAGES 13 THROUGH 17, THEREOF, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, BEING N89°27'25"E.

Underground Service Alert
Call: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG

| REV. | REVISION DESCRIPTION | DATE | ENGR. | CITY | DATE |
|---|---|---|---|---|---|
| 2 | RECORD DRAWING | 2-22-08 | TT | RG | 3/3/08 |
| 1 | REVISED STORM DRAIN TO GO UNDER FIRE LINE; REVISED MANHOLE DETAIL | 10/29/07 | TT | RG | 11-9-07 |

SHOULD CONSTRUCTION OF THE REQUIRED IMPROVEMENTS NOT COMMENCE WITHIN TWO YEARS OF THE DATE OF APPROVAL SHOWN HEREON AND CARRIED FORTH IN A DILIGENT MANNER, THE CITY ENGINEER MAY REQUIRE REVISIONS TO THE PLANS TO BRING THEM INTO CONFORMANCE WITH CONDITIONS AND STANDARDS IN EFFECT.

REGISTERED PROFESSIONAL ENGINEER
TERESITO N. TABIOLO
RCE No. 38826
Exp. 3-31-07
CIVIL
STATE OF CALIFORNIA

TERESITO N. TABIOLO R.C.E. 38826 EXP. 03-31-07


KCT CONSULTANTS, INC.
Civil Engineers - Surveyors - Planners
P.O. Box 5705 Riverside, CA 92517-5705
4344 Latham St., Suite 200, Riverside, CA 92501
Phone: 951-341-8940 Fax: 951-341-8945
e-mail: kctinc@kctconsultants.com


Prepared Under The Supervision Of :

Date 10-25-06

W.O.: 1335-02

# CITY OF FONTANA, CALIFORNIA

## STORM DRAIN IMPROVEMENT PLANS

ETIWANDA AVENUE
LINE A STORM DRAIN
STA 47+38.87 TO STA 56+27.83

| | | | |
|---|---|---|---|
| DRAWN BY: | NO | SCALE: | 1"=40' |
| DESIGNED BY: | RC | DATE: | 04/12/06 |
| CHECKED BY: | RG / TT | APPROVED BY: | CITY ENGINEER R.C.E. 51152 DATE 11-9-07 |
| | | DWG. NO.: | 4067 |
| | | | 2/3 |

www.nws.noaa.gov

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



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# NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

## Data description

Data type: Precipitation depth | Units: English | Time series type: Partial duration

## Select location

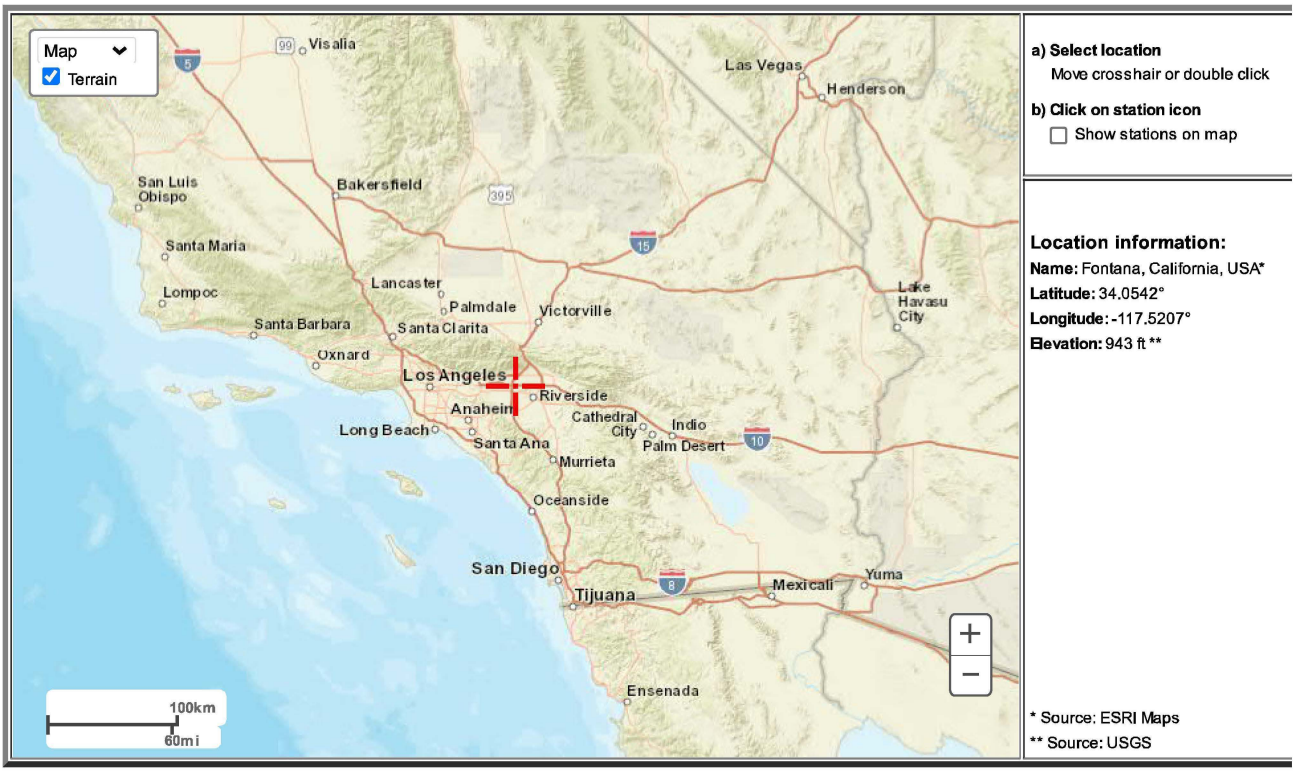
**1) Manually:**

a) **By location** (decimal degrees, use "-" for S and W): Latitude: 34.05419 Longitude: -117.52069 Submit

b) **By station** (list of CA stations): Select station

c) **By address** Search

**2) Use map:**




## POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

**WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION**
**NOAA Atlas 14, Volume 6, Version 2**

PF tabular | PF graphical | Supplementary information | Print page

**PDS-based 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 | **0.102** (0.085-0.123) | **0.134** (0.112-0.163) | **0.176** (0.147-0.215) | **0.211** (0.174-0.259) | **0.258** (0.205-0.328) | **0.295** (0.229-0.383) | **0.332** (0.252-0.442) | **0.371** (0.274-0.509) | **0.425** (0.300-0.608) | **0.467** (0.318-0.692) |
| 10-min | **0.146** (0.122-0.177) | **0.192** (0.160-0.233) | **0.253** (0.210-0.308) | **0.302** (0.249-0.371) | **0.370** (0.294-0.470) | **0.423** (0.329-0.549) | **0.476** (0.361-0.634) | **0.532** (0.392-0.729) | **0.609** (0.430-0.871) | **0.669** (0.456-0.992) |
| 15-min | **0.177** (0.147-0.214) | **0.232** (0.194-0.282) | **0.306** (0.254-0.372) | **0.366** (0.301-0.449) | **0.448** (0.356-0.569) | **0.511** (0.398-0.663) | **0.576** (0.437-0.767) | **0.644** (0.474-0.882) | **0.736** (0.520-1.05) | **0.809** (0.551-1.20) |
| 30-min | **0.266** (0.222-0.322) | **0.350** (0.292-0.425) | **0.461** (0.383-0.560) | **0.551** (0.454-0.676) | **0.674** (0.536-0.856) | **0.770** (0.599-0.999) | **0.868** (0.658-1.16) | **0.969** (0.714-1.33) | **1.11** (0.783-1.59) | **1.22** (0.830-1.81) |
| 60-min | **0.393** (0.328-0.476) | **0.518** (0.431-0.628) | **0.681** (0.566-0.829) | **0.815** (0.671-0.999) | **0.997** (0.793-1.27) | **1.14** (0.886-1.48) | **1.28** (0.973-1.71) | **1.43** (1.06-1.96) | **1.64** (1.16-2.35) | **1.80** (1.23-2.67) |
| 2-hr | **0.587** (0.489-0.711) | **0.763** (0.635-0.925) | **0.990** (0.822-1.20) | **1.17** (0.966-1.44) | **1.42** (1.13-1.80) | **1.61** (1.25-2.09) | **1.80** (1.37-2.40) | **2.00** (1.47-2.74) | **2.27** (1.60-3.24) | **2.47** (1.68-3.67) |
| 3-hr | **0.742** | **0.960** | **1.24** | **1.46** | **1.76** | **1.99** | **2.22** | **2.46** | **2.77** | **3.02** |

| | (0.619-0.899) | (0.800-1.16) | (1.03-1.51) | (1.21-1.80) | (1.40-2.24) | (1.55-2.59) | (1.69-2.96) | (1.81-3.37) | (1.96-3.97) | (2.05-4.47) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6-hr | **1.05** (0.878-1.28) | **1.36** (1.13-1.65) | **1.75** (1.45-2.13) | **2.06** (1.70-2.53) | **2.47** (1.96-3.14) | **2.77** (2.16-3.60) | **3.08** (2.33-4.10) | **3.38** (2.49-4.64) | **3.79** (2.68-5.42) | **4.10** (2.79-6.08) |
| 12-hr | **1.38** (1.15-1.68) | **1.80** (1.50-2.19) | **2.33** (1.94-2.84) | **2.74** (2.26-3.36) | **3.28** (2.61-4.16) | **3.67** (2.86-4.76) | **4.05** (3.08-5.40) | **4.44** (3.27-6.08) | **4.93** (3.48-7.06) | **5.30** (3.61-7.86) |
| 24-hr | **1.85** (1.64-2.13) | **2.45** (2.16-2.82) | **3.19** (2.82-3.69) | **3.77** (3.30-4.40) | **4.52** (3.83-5.45) | **5.06** (4.20-6.23) | **5.60** (4.53-7.05) | **6.12** (4.82-7.92) | **6.79** (5.14-9.16) | **7.29** (5.33-10.2) |
| 2-day | **2.26** (2.00-2.60) | **3.05** (2.70-3.52) | **4.06** (3.58-4.70) | **4.85** (4.25-5.66) | **5.90** (4.99-7.10) | **6.67** (5.53-8.20) | **7.43** (6.02-9.36) | **8.20** (6.46-10.6) | **9.20** (6.96-12.4) | **9.94** (7.27-13.9) |
| 3-day | **2.47** (2.18-2.85) | **3.39** (3.00-3.92) | **4.58** (4.04-5.30) | **5.53** (4.84-6.45) | **6.79** (5.75-8.19) | **7.75** (6.43-9.53) | **8.70** (7.05-11.0) | **9.67** (7.62-12.5) | **11.0** (8.29-14.8) | **11.9** (8.73-16.7) |
| 4-day | **2.70** (2.39-3.11) | **3.74** (3.31-4.32) | **5.10** (4.50-5.90) | **6.19** (5.42-7.22) | **7.66** (6.49-9.23) | **8.78** (7.28-10.8) | **9.91** (8.03-12.5) | **11.1** (8.72-14.3) | **12.6** (9.54-17.0) | **13.8** (10.1-19.3) |
| 7-day | **3.16** (2.80-3.64) | **4.42** (3.91-5.10) | **6.08** (5.36-7.04) | **7.44** (6.51-8.68) | **9.29** (7.86-11.2) | **10.7** (8.89-13.2) | **12.2** (9.86-15.3) | **13.7** (10.8-17.7) | **15.7** (11.9-21.2) | **17.3** (12.7-24.2) |
| 10-day | **3.41** (3.02-3.93) | **4.80** (4.24-5.54) | **6.64** (5.86-7.68) | **8.16** (7.14-9.52) | **10.2** (8.68-12.4) | **11.9** (9.85-14.6) | **13.5** (11.0-17.1) | **15.3** (12.0-19.8) | **17.7** (13.4-23.8) | **19.5** (14.3-27.3) |
| 20-day | **3.98** (3.52-4.58) | **5.67** (5.01-6.54) | **7.96** (7.02-9.21) | **9.88** (8.64-11.5) | **12.6** (10.6-15.2) | **14.7** (12.2-18.1) | **16.9** (13.7-21.3) | **19.3** (15.2-25.0) | **22.6** (17.1-30.5) | **25.2** (18.5-35.2) |
| 30-day | **4.69** (4.15-5.40) | **6.71** (5.93-7.75) | **9.48** (8.36-11.0) | **11.8** (10.3-13.8) | **15.1** (12.8-18.3) | **17.8** (14.8-21.9) | **20.6** (16.7-26.0) | **23.6** (18.6-30.6) | **27.8** (21.0-37.5) | **31.2** (22.8-43.6) |
| 45-day | **5.55** (4.92-6.40) | **7.93** (7.01-9.15) | **11.2** (9.89-13.0) | **14.0** (12.3-16.4) | **18.0** (15.3-21.7) | **21.3** (17.7-26.2) | **24.8** (20.0-31.2) | **28.5** (22.4-36.9) | **33.8** (25.5-45.5) | **38.1** (27.8-53.1) |
| 60-day | **6.46** (5.72-7.45) | **9.16** (8.10-10.6) | **12.9** (11.4-14.9) | **16.1** (14.1-18.8) | **20.8** (17.6-25.0) | **24.6** (20.4-30.2) | **28.6** (23.2-36.0) | **33.0** (26.0-42.7) | **39.2** (29.7-52.9) | **44.4** (32.5-61.9) |

[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.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

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National Oceanic and Atmospheric Administration
National Weather Service
Office of Water Prediction (OWP)
1325 East West Highway
Silver Spring, MD 20910
Page Author: HDSC webmaster
Page last modified: April 21, 2017

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Map Unit Legend

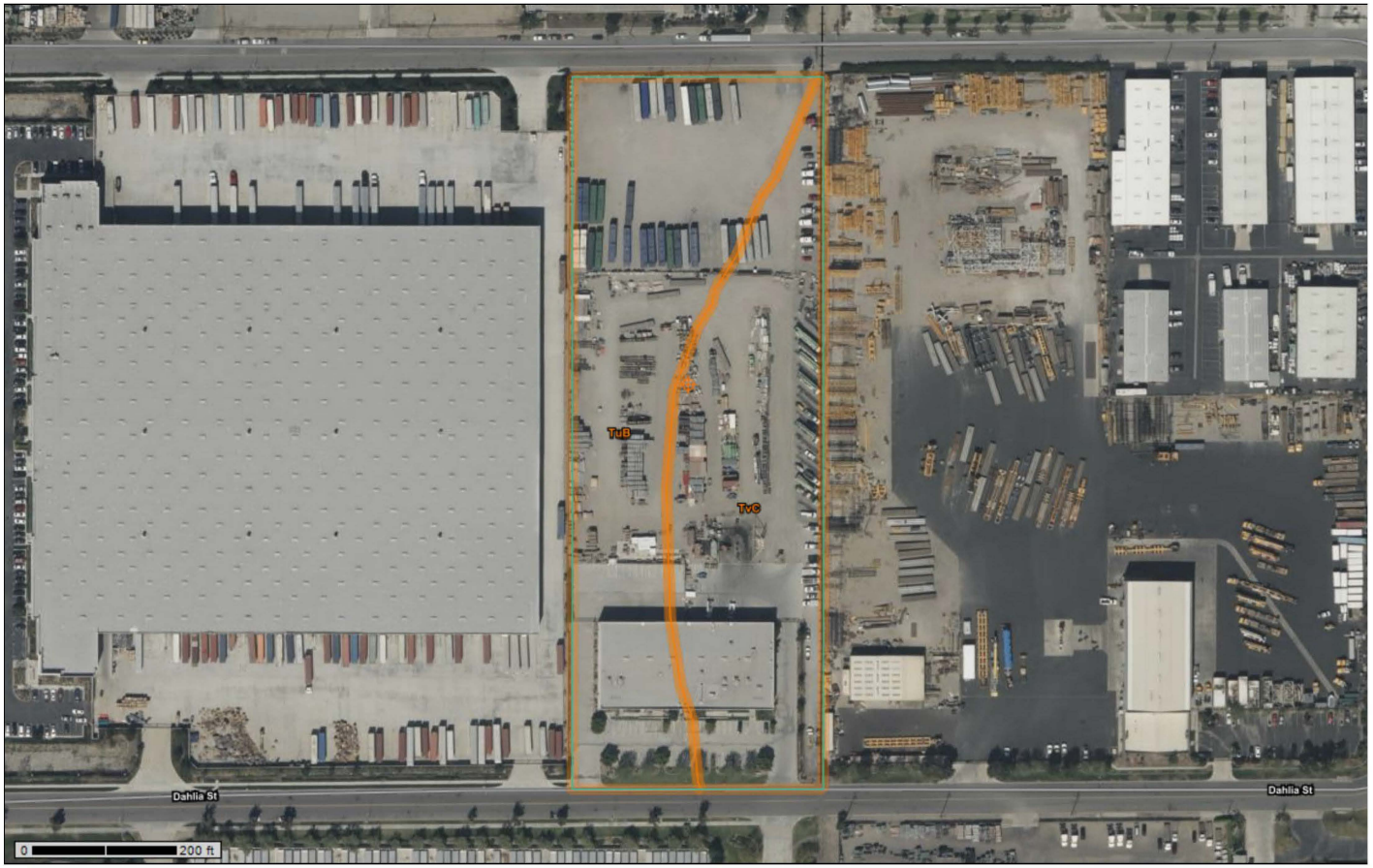
**San Bernardino County Southwestern Part, California (CA677)**

San Bernardino County Southwestern Part, California (CA677)

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| TuB | Tujunga loamy sand, 0 to 5 percent slopes | 4.2 | 53.5% |
| TvC | Tujunga gravelly loamy sand, 0 to 9 percent slopes | 3.6 | 46.5% |
| **Totals for Area of Interest** | | **7.8** | **100.0%** |

Soil Map

Scale (not to scale)




**Warning: Soil Map may not be valid at this scale.**

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:24,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

# San Bernardino County Southwestern Part, California

## TvC—Tujunga gravelly loamy sand, 0 to 9 percent slopes

### Map Unit Setting

*National map unit symbol:* hcl2
*Elevation:* 10 to 1,500 feet
*Mean annual precipitation:* 10 to 25 inches
*Mean annual air temperature:* 59 to 64 degrees F
*Frost-free period:* 250 to 350 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Tujunga and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Tujunga

#### Setting

*Landform:* Alluvial fans
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium derived from granite

#### Typical profile

*H1 - 0 to 36 inches:* gravelly loamy sand
*H2 - 36 to 60 inches:* gravelly sand

#### Properties and qualities

*Slope:* 0 to 9 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat excessively drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Low (about 3.8 inches)

avg. 12.96"/hr

#### Interpretive groups

*Land capability classification (irrigated):* 4s
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* A
*Ecological site:* R019XG912CA - Sandy Fan
*Hydric soil rating:* No

**Minor Components**

**Unnamed**
*Percent of map unit:* 5 percent
*Landform:* Drainageways
*Hydric soil rating:* Yes

**Soboba, gravelly loamy sand**
*Percent of map unit:* 5 percent
*Hydric soil rating:* No

**Delhi, fine sand**
*Percent of map unit:* 5 percent
*Hydric soil rating:* No

# Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 14, Sep 6, 2022

# San Bernardino County Southwestern Part, California

## TuB—Tujunga loamy sand, 0 to 5 percent slopes

### Map Unit Setting

*National map unit symbol:* 2sx6y
*Elevation:* 650 to 3,110 feet
*Mean annual precipitation:* 10 to 25 inches
*Mean annual air temperature:* 62 to 65 degrees F
*Frost-free period:* 325 to 365 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Tujunga, loamy sand, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Tujunga, Loamy Sand

#### Setting

*Landform:* Alluvial fans
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium derived from granite

#### Typical profile

*A - 0 to 6 inches:* loamy sand
*C1 - 6 to 18 inches:* loamy sand
*C2 - 18 to 60 inches:* loamy sand

#### Properties and qualities

*Slope:* 0 to 5 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat excessively drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* A
*Ecological site:* R019XG912CA - Sandy Fan
*Hydric soil rating:* No

**Minor Components**

**Tujunga, gravelly loamy sand**
*Percent of map unit:* 10 percent
*Landform:* Alluvial fans
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Hanford, sandy loam**
*Percent of map unit:* 5 percent
*Landform:* Alluvial fans
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

# Data Source Information

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 14, Sep 6, 2022

### Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

| Factor Category | | Factor Description | Assigned Weight (w) | Factor Value (v) | Product (p) p = w x v |
|---|---|---|---|---|---|
| A | Suitability Assessment | Soil assessment methods | 0.25 | 3 | 0.75 |
| | | Predominant soil texture | 0.25 | 1 | 0.25 |
| | | Site soil variability | 0.25 | 1 | 0.25 |
| | | Depth to groundwater / impervious layer | 0.25 | 1 | 0.25 |
| | | Suitability Assessment Safety Factor, $S_A = \Sigma p$ | | | 1.50 |
| B | Design | Tributary area size | 0.25 | 2 | 0.50 |
| | | Level of pretreatment/ expected sediment loads | 0.25 | 2 | 0.50 |
| | | Redundancy | 0.25 | 3 | 0.75 |
| | | Compaction during construction | 0.25 | 1 | 0.25 |
| | | Design Safety Factor, $S_B = \Sigma p$ | | | 2.00 |
| Combined Safety Factor, $S_{TOT} = S_A \times S_B$ | | | | | 3.00 |
| Measured Infiltration Rate, inch/hr, $K_M$ (corrected for test-specific bias) | | | | | 12.96 |
| Design Infiltration Rate, in/hr, $K_{DESIGN} = S_{TOT} / K_M$ | | | | | 4.3 |

**Supporting Data**

Briefly describe infiltration test and provide reference to test forms:

Average Inf. Rate : 12.96 in/hr from USDA WebSoil Report
Design Inf Rate: 12.96/3.0 = 4.3"/hr

**Note:** The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

# Hydrology Calculation
# Rational Method Hydrology

# Developed Condition (100-yr Storm Event)

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2016 Advanced Engineering Software (aes)
             Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                        *
* DEVELOPED CONDITION                                                   *
* 100-YR STORM EVENT                                                    *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 13:08 06/21/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2800

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   962.00
  ELEVATION DATA: UPSTREAM(FEET) =    948.80  DOWNSTREAM(FEET) =    936.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.345
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.477
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        5.50      0.74     0.100    52   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     16.84
```

```
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =     16.84

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   936.50  DOWNSTREAM(FEET) =   934.80
  FLOW LENGTH(FEET) =   284.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.26
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.84
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   12.10
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1246.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      2.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.10
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.345
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    6.77
  EFFECTIVE AREA(ACRES) =      7.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.8       PEAK FLOW RATE(CFS) =      22.96
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     12.10
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      22.96
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Existing Condition (100-yr Storm Event)

```
**************************************************************************
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                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                         *
* EXISTING CONDITION                                                     *
* 100-YR STORM EVENT                                                     *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 13:47 06/19/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9970

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   752.00
  ELEVATION DATA: UPSTREAM(FEET) =    949.00  DOWNSTREAM(FEET) =    937.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.277
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          A        5.50      0.98     0.800    32   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.800
```

25-yr, 1-hr intensity

```
  SUBAREA RUNOFF(CFS) =      7.41
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      7.41

****************************************************************************
  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) =    937.00  DOWNSTREAM(FEET) =    934.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   296.00   CHANNEL SLOPE =  0.0078
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.210
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.39
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   0.77
  Tc(MIN.) =   15.92
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    4.37
  EFFECTIVE AREA(ACRES) =      7.80     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.97  AREA-AVERAGED Ap =   0.59
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =      11.45

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   7.63

  ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1040.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     15.92
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap = 0.594
  PEAK FLOW RATE(CFS)   =      11.45
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Developed Condition (25-yr Storm Event)

```
******************************************************************************
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                         *
* DEVELOPED CONDITION                                                    *
* 25-YR STORM EVENT                                                      *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 11:55 07/01/2023
==============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9970

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

******************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   962.00
  ELEVATION DATA: UPSTREAM(FEET) =    948.80  DOWNSTREAM(FEET) =    936.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.345
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.708
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        5.50      0.74     0.100    52   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     13.04
```

```
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =     13.04

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   936.50  DOWNSTREAM(FEET) =   934.80
  FLOW LENGTH(FEET) =   284.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.85
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.04
  PIPE TRAVEL TIME(MIN.) =   0.81    Tc(MIN.) =   12.15
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1246.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      2.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.15
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.599
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    5.23
  EFFECTIVE AREA(ACRES) =      7.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.8       PEAK FLOW RATE(CFS) =      17.72
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     12.15
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      17.72
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Existing Condition (25-yr Storm Event)

```
**************************************************************************
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                         *
* EXISTING CONDITION                                                     *
* 28-YR STORM EVENT                                                      *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 12:06 07/01/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8150

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.00
  ELEVATION DATA: UPSTREAM(FEET) =    946.00  DOWNSTREAM(FEET) =    934.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.861
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          A        5.50      0.98     0.800    32   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.800
```

```
  SUBAREA RUNOFF(CFS) =      5.35
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      5.35

****************************************************************************
  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) =    934.30  DOWNSTREAM(FEET) =    932.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   296.00   CHANNEL SLOPE =  0.0078
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.788
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                A        2.30      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.73
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   1.04
  Tc(MIN.) =   16.20
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    3.50
  EFFECTIVE AREA(ACRES) =      7.80     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.97  AREA-AVERAGED Ap =   0.59
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       8.49

         ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
             CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
             ALLOWABLE DEPTH).
             AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
             ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   5.66

  ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1040.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     16.20
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap = 0.594
  PEAK FLOW RATE(CFS)   =       8.49
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Developed Condition (10-yr Storm Event)

```
**************************************************************************
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                         *
* DEVELOPED CONDITION                                                    *
* 10-YR STOR EVENT                                                       *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 11:59 07/01/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8150

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   962.00
  ELEVATION DATA: UPSTREAM(FEET) =    948.80  DOWNSTREAM(FEET) =    936.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.345
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.214
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        5.50      0.74     0.100    52   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.59
```

```
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =     10.59

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   936.50  DOWNSTREAM(FEET) =   934.80
  FLOW LENGTH(FEET) =   284.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.48
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.59
  PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =   12.21
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1246.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      2.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.119
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    4.23
  EFFECTIVE AREA(ACRES) =      7.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.8       PEAK FLOW RATE(CFS) =      14.35
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     12.21
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      14.35
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Existing Condition (10-yr Storm Event)

```
****************************************************************************
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            Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                        *
* EXISTING CONDITION                                                    *
* 10YR STORM EVENT                                                      *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 12:13 07/01/2023
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.6810

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.00
  ELEVATION DATA: UPSTREAM(FEET) =    946.00  DOWNSTREAM(FEET) =    934.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.555
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          A        5.50      0.98     0.800    32   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.800
```

```
  SUBAREA RUNOFF(CFS) =      3.84
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      3.84

****************************************************************************
  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) =    934.30  DOWNSTREAM(FEET) =    932.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   296.00   CHANNEL SLOPE =  0.0078
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.485
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.09
  AVERAGE FLOW DEPTH(FEET) =   0.45   TRAVEL TIME(MIN.) =   1.21
  Tc(MIN.) =   16.36
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    2.87
  EFFECTIVE AREA(ACRES) =      7.80     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.97  AREA-AVERAGED Ap =   0.59
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       6.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.32
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1040.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     16.36
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap = 0.594
  PEAK FLOW RATE(CFS)   =       6.36
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Developed Condition (5-yr Storm Event)

```
****************************************************************************
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                        *
* DEVELOPED CONDITION                                                   *
* 5-YR STORM EVENT                                                      *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 12:02 07/01/2023
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.6810

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   962.00
  ELEVATION DATA: UPSTREAM(FEET) =    948.80  DOWNSTREAM(FEET) =    936.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.345
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.850
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        5.50      0.74     0.100    52   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      8.79
```

```
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      8.79

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   936.50  DOWNSTREAM(FEET) =   934.80
  FLOW LENGTH(FEET) =   284.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.31
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.79
  PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =   12.24
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1246.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      2.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.24
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.768
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    3.51
  EFFECTIVE AREA(ACRES) =      7.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.8       PEAK FLOW RATE(CFS) =      11.89
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     12.24
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      11.89
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Existing Condition (5-yr Storm Event)

```
**************************************************************************
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                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* CONCO, FONTANA                                                         *
* EXISTING CONDITION                                                     *
* 5-STORM EVENT                                                          *
 ************************************************************************

  FILE NAME: CONC.DAT
  TIME/DATE OF STUDY: 12:19 07/01/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5180

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *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.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      1.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.00
  ELEVATION DATA: UPSTREAM(FEET) =    946.00  DOWNSTREAM(FEET) =    934.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.152
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.183
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "1 DWELLING/ACRE"          A        5.50      0.98     0.800    32   15.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.800
```

```
  SUBAREA RUNOFF(CFS) =      1.99
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      1.99

****************************************************************************
  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) =    934.30  DOWNSTREAM(FEET) =    932.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   296.00   CHANNEL SLOPE =  0.0078
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.121
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.30      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.46
  AVERAGE FLOW DEPTH(FEET) =   0.33   TRAVEL TIME(MIN.) =   1.42
  Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    2.12
  EFFECTIVE AREA(ACRES) =      7.80     AREA-AVERAGED Fm(INCH/HR) =   0.58
  AREA-AVERAGED Fp(INCH/HR) =   0.97  AREA-AVERAGED Ap =   0.59
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       3.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   3.74
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE      2.00 =    1040.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        7.8  TC(MIN.) =     16.58
  EFFECTIVE AREA(ACRES) =      7.80  AREA-AVERAGED Fm(INCH/HR)=  0.58
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap = 0.594
  PEAK FLOW RATE(CFS)   =       3.80
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

# Hydrology Calculation
# Unit Hydrograph Analysis

# Unit Hydrograph Analysis: Developed Condition (100 yr, 24 hr Storm Event)

```
        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 - 2018, Version 9.0

                Study date  06/04/23

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

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


Program License Serial Number 6484

------------------------------------------------------------------------
UH ANALYSIS
DEVELOPED CONDITION
100-YR STORM EVENT

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

        Storm Event Year = 100

        Antecedent Moisture Condition = 3

 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        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 100
             7.80            1           1.28
------------------------------------------------------------------------
Rainfall data for year 100
             7.80            6           3.08
------------------------------------------------------------------------
Rainfall data for year 100
             7.80           24           5.60
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      52.0          7.80      1.000     0.785    0.100    0.079

Area-averaged adjusted loss rate Fm (In/Hr) =  0.079

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
     0.78   0.100         32.0      52.0       9.23     0.194
     7.02   0.900         98.0      98.0       0.20     0.958

Area-averaged catchment yield fraction, Y =  0.881
Area-averaged low loss fraction, Yb =  0.119
Direct entry of lag time by user
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Watershed area = 7.80(Ac.)
Catchment Lag time = 0.164 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 50.8130
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.119 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.474(In)
Computed peak 30-minute rainfall = 0.970(In)
Specified peak 1-hour rainfall = 1.280(In)
Computed peak 3-hour rainfall = 2.193(In)
Specified peak 6-hour rainfall = 3.080(In)
Specified peak 24-hour rainfall = 5.600(In)

Rainfall depth area reduction factors:
Using a total area of 7.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.474(In)
30-minute factor = 1.000 Adjusted rainfall = 0.970(In)
1-hour factor = 1.000 Adjusted rainfall = 1.280(In)
3-hour factor = 1.000 Adjusted rainfall = 2.193(In)
6-hour factor = 1.000 Adjusted rainfall = 3.080(In)
24-hour factor = 1.000 Adjusted rainfall = 5.600(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 = 94.33 (CFS)) | |
| 1 | 4.721 | 4.453 |
| 2 | 30.727 | 24.532 |
| 3 | 70.062 | 37.105 |
| 4 | 90.587 | 19.362 |
| 5 | 97.250 | 6.286 |
| 6 | 98.831 | 1.491 |
| 7 | 100.000 | 1.103 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4736 | 0.4736 |
| 2 | 0.6249 | 0.1513 |
| 3 | 0.7349 | 0.1100 |
| 4 | 0.8245 | 0.0896 |
| 5 | 0.9015 | 0.0770 |
| 6 | 0.9697 | 0.0682 |
| 7 | 1.0314 | 0.0617 |
| 8 | 1.0880 | 0.0566 |
| 9 | 1.1404 | 0.0525 |
| 10 | 1.1895 | 0.0491 |
| 11 | 1.2358 | 0.0462 |
| 12 | 1.2795 | 0.0438 |
| 13 | 1.3308 | 0.0512 |
| 14 | 1.3800 | 0.0492 |
| 15 | 1.4275 | 0.0475 |
| 16 | 1.4734 | 0.0459 |
| 17 | 1.5178 | 0.0445 |
| 18 | 1.5610 | 0.0431 |
| 19 | 1.6029 | 0.0419 |
| 20 | 1.6437 | 0.0408 |
| 21 | 1.6835 | 0.0398 |
| 22 | 1.7224 | 0.0388 |
| 23 | 1.7603 | 0.0380 |
| 24 | 1.7975 | 0.0371 |
| 25 | 1.8338 | 0.0363 |
| 26 | 1.8694 | 0.0356 |
| 27 | 1.9043 | 0.0349 |

| | | |
|---|---|---|
| 28 | 1.9386 | 0.0343 |
| 29 | 1.9722 | 0.0336 |
| 30 | 2.0053 | 0.0331 |
| 31 | 2.0378 | 0.0325 |
| 32 | 2.0698 | 0.0320 |
| 33 | 2.1013 | 0.0315 |
| 34 | 2.1322 | 0.0310 |
| 35 | 2.1628 | 0.0305 |
| 36 | 2.1928 | 0.0301 |
| 37 | 2.2225 | 0.0296 |
| 38 | 2.2517 | 0.0292 |
| 39 | 2.2806 | 0.0288 |
| 40 | 2.3090 | 0.0285 |
| 41 | 2.3372 | 0.0281 |
| 42 | 2.3649 | 0.0278 |
| 43 | 2.3924 | 0.0274 |
| 44 | 2.4195 | 0.0271 |
| 45 | 2.4463 | 0.0268 |
| 46 | 2.4728 | 0.0265 |
| 47 | 2.4990 | 0.0262 |
| 48 | 2.5249 | 0.0259 |
| 49 | 2.5505 | 0.0256 |
| 50 | 2.5759 | 0.0254 |
| 51 | 2.6010 | 0.0251 |
| 52 | 2.6259 | 0.0249 |
| 53 | 2.6505 | 0.0246 |
| 54 | 2.6749 | 0.0244 |
| 55 | 2.6991 | 0.0242 |
| 56 | 2.7230 | 0.0239 |
| 57 | 2.7467 | 0.0237 |
| 58 | 2.7702 | 0.0235 |
| 59 | 2.7936 | 0.0233 |
| 60 | 2.8167 | 0.0231 |
| 61 | 2.8396 | 0.0229 |
| 62 | 2.8623 | 0.0227 |
| 63 | 2.8848 | 0.0225 |
| 64 | 2.9072 | 0.0224 |
| 65 | 2.9293 | 0.0222 |
| 66 | 2.9513 | 0.0220 |
| 67 | 2.9732 | 0.0218 |
| 68 | 2.9948 | 0.0217 |
| 69 | 3.0163 | 0.0215 |
| 70 | 3.0377 | 0.0213 |
| 71 | 3.0589 | 0.0212 |
| 72 | 3.0799 | 0.0210 |
| 73 | 3.0983 | 0.0184 |
| 74 | 3.1165 | 0.0182 |
| 75 | 3.1346 | 0.0181 |
| 76 | 3.1526 | 0.0180 |
| 77 | 3.1704 | 0.0178 |
| 78 | 3.1881 | 0.0177 |
| 79 | 3.2057 | 0.0176 |
| 80 | 3.2231 | 0.0174 |
| 81 | 3.2404 | 0.0173 |
| 82 | 3.2576 | 0.0172 |
| 83 | 3.2747 | 0.0171 |
| 84 | 3.2916 | 0.0170 |
| 85 | 3.3085 | 0.0168 |
| 86 | 3.3252 | 0.0167 |
| 87 | 3.3418 | 0.0166 |
| 88 | 3.3583 | 0.0165 |
| 89 | 3.3747 | 0.0164 |
| 90 | 3.3910 | 0.0163 |
| 91 | 3.4072 | 0.0162 |
| 92 | 3.4233 | 0.0161 |
| 93 | 3.4393 | 0.0160 |
| 94 | 3.4552 | 0.0159 |
| 95 | 3.4710 | 0.0158 |
| 96 | 3.4868 | 0.0157 |
| 97 | 3.5024 | 0.0156 |
| 98 | 3.5179 | 0.0155 |

| | | |
|---|---|---|
| 99 | 3.5333 | 0.0154 |
| 100 | 3.5487 | 0.0153 |
| 101 | 3.5639 | 0.0153 |
| 102 | 3.5791 | 0.0152 |
| 103 | 3.5942 | 0.0151 |
| 104 | 3.6092 | 0.0150 |
| 105 | 3.6241 | 0.0149 |
| 106 | 3.6390 | 0.0148 |
| 107 | 3.6537 | 0.0148 |
| 108 | 3.6684 | 0.0147 |
| 109 | 3.6830 | 0.0146 |
| 110 | 3.6976 | 0.0145 |
| 111 | 3.7120 | 0.0145 |
| 112 | 3.7264 | 0.0144 |
| 113 | 3.7407 | 0.0143 |
| 114 | 3.7550 | 0.0142 |
| 115 | 3.7691 | 0.0142 |
| 116 | 3.7832 | 0.0141 |
| 117 | 3.7973 | 0.0140 |
| 118 | 3.8112 | 0.0140 |
| 119 | 3.8251 | 0.0139 |
| 120 | 3.8390 | 0.0138 |
| 121 | 3.8527 | 0.0138 |
| 122 | 3.8664 | 0.0137 |
| 123 | 3.8801 | 0.0136 |
| 124 | 3.8936 | 0.0136 |
| 125 | 3.9071 | 0.0135 |
| 126 | 3.9206 | 0.0134 |
| 127 | 3.9340 | 0.0134 |
| 128 | 3.9473 | 0.0133 |
| 129 | 3.9606 | 0.0133 |
| 130 | 3.9738 | 0.0132 |
| 131 | 3.9870 | 0.0132 |
| 132 | 4.0000 | 0.0131 |
| 133 | 4.0131 | 0.0130 |
| 134 | 4.0261 | 0.0130 |
| 135 | 4.0390 | 0.0129 |
| 136 | 4.0519 | 0.0129 |
| 137 | 4.0647 | 0.0128 |
| 138 | 4.0775 | 0.0128 |
| 139 | 4.0902 | 0.0127 |
| 140 | 4.1029 | 0.0127 |
| 141 | 4.1155 | 0.0126 |
| 142 | 4.1280 | 0.0126 |
| 143 | 4.1405 | 0.0125 |
| 144 | 4.1530 | 0.0125 |
| 145 | 4.1654 | 0.0124 |
| 146 | 4.1778 | 0.0124 |
| 147 | 4.1901 | 0.0123 |
| 148 | 4.2024 | 0.0123 |
| 149 | 4.2146 | 0.0122 |
| 150 | 4.2268 | 0.0122 |
| 151 | 4.2389 | 0.0121 |
| 152 | 4.2510 | 0.0121 |
| 153 | 4.2630 | 0.0120 |
| 154 | 4.2750 | 0.0120 |
| 155 | 4.2870 | 0.0119 |
| 156 | 4.2989 | 0.0119 |
| 157 | 4.3107 | 0.0119 |
| 158 | 4.3225 | 0.0118 |
| 159 | 4.3343 | 0.0118 |
| 160 | 4.3461 | 0.0117 |
| 161 | 4.3577 | 0.0117 |
| 162 | 4.3694 | 0.0117 |
| 163 | 4.3810 | 0.0116 |
| 164 | 4.3926 | 0.0116 |
| 165 | 4.4041 | 0.0115 |
| 166 | 4.4156 | 0.0115 |
| 167 | 4.4271 | 0.0115 |
| 168 | 4.4385 | 0.0114 |
| 169 | 4.4498 | 0.0114 |

| | | |
|---|---|---|
| 170 | 4.4612 | 0.0113 |
| 171 | 4.4725 | 0.0113 |
| 172 | 4.4837 | 0.0113 |
| 173 | 4.4950 | 0.0112 |
| 174 | 4.5062 | 0.0112 |
| 175 | 4.5173 | 0.0112 |
| 176 | 4.5284 | 0.0111 |
| 177 | 4.5395 | 0.0111 |
| 178 | 4.5505 | 0.0110 |
| 179 | 4.5615 | 0.0110 |
| 180 | 4.5725 | 0.0110 |
| 181 | 4.5835 | 0.0109 |
| 182 | 4.5944 | 0.0109 |
| 183 | 4.6052 | 0.0109 |
| 184 | 4.6161 | 0.0108 |
| 185 | 4.6269 | 0.0108 |
| 186 | 4.6376 | 0.0108 |
| 187 | 4.6484 | 0.0107 |
| 188 | 4.6591 | 0.0107 |
| 189 | 4.6697 | 0.0107 |
| 190 | 4.6804 | 0.0106 |
| 191 | 4.6910 | 0.0106 |
| 192 | 4.7016 | 0.0106 |
| 193 | 4.7121 | 0.0105 |
| 194 | 4.7226 | 0.0105 |
| 195 | 4.7331 | 0.0105 |
| 196 | 4.7436 | 0.0105 |
| 197 | 4.7540 | 0.0104 |
| 198 | 4.7644 | 0.0104 |
| 199 | 4.7747 | 0.0104 |
| 200 | 4.7851 | 0.0103 |
| 201 | 4.7954 | 0.0103 |
| 202 | 4.8057 | 0.0103 |
| 203 | 4.8159 | 0.0102 |
| 204 | 4.8261 | 0.0102 |
| 205 | 4.8363 | 0.0102 |
| 206 | 4.8465 | 0.0102 |
| 207 | 4.8566 | 0.0101 |
| 208 | 4.8667 | 0.0101 |
| 209 | 4.8768 | 0.0101 |
| 210 | 4.8868 | 0.0100 |
| 211 | 4.8968 | 0.0100 |
| 212 | 4.9068 | 0.0100 |
| 213 | 4.9168 | 0.0100 |
| 214 | 4.9268 | 0.0099 |
| 215 | 4.9367 | 0.0099 |
| 216 | 4.9466 | 0.0099 |
| 217 | 4.9564 | 0.0099 |
| 218 | 4.9663 | 0.0098 |
| 219 | 4.9761 | 0.0098 |
| 220 | 4.9859 | 0.0098 |
| 221 | 4.9956 | 0.0098 |
| 222 | 5.0054 | 0.0097 |
| 223 | 5.0151 | 0.0097 |
| 224 | 5.0247 | 0.0097 |
| 225 | 5.0344 | 0.0097 |
| 226 | 5.0440 | 0.0096 |
| 227 | 5.0537 | 0.0096 |
| 228 | 5.0632 | 0.0096 |
| 229 | 5.0728 | 0.0096 |
| 230 | 5.0824 | 0.0095 |
| 231 | 5.0919 | 0.0095 |
| 232 | 5.1014 | 0.0095 |
| 233 | 5.1108 | 0.0095 |
| 234 | 5.1203 | 0.0094 |
| 235 | 5.1297 | 0.0094 |
| 236 | 5.1391 | 0.0094 |
| 237 | 5.1485 | 0.0094 |
| 238 | 5.1579 | 0.0094 |
| 239 | 5.1672 | 0.0093 |
| 240 | 5.1765 | 0.0093 |

| | | |
|---|---|---|
| 241 | 5.1858 | 0.0093 |
| 242 | 5.1951 | 0.0093 |
| 243 | 5.2043 | 0.0092 |
| 244 | 5.2135 | 0.0092 |
| 245 | 5.2227 | 0.0092 |
| 246 | 5.2319 | 0.0092 |
| 247 | 5.2411 | 0.0092 |
| 248 | 5.2502 | 0.0091 |
| 249 | 5.2593 | 0.0091 |
| 250 | 5.2684 | 0.0091 |
| 251 | 5.2775 | 0.0091 |
| 252 | 5.2866 | 0.0091 |
| 253 | 5.2956 | 0.0090 |
| 254 | 5.3046 | 0.0090 |
| 255 | 5.3136 | 0.0090 |
| 256 | 5.3226 | 0.0090 |
| 257 | 5.3316 | 0.0090 |
| 258 | 5.3405 | 0.0089 |
| 259 | 5.3494 | 0.0089 |
| 260 | 5.3583 | 0.0089 |
| 261 | 5.3672 | 0.0089 |
| 262 | 5.3760 | 0.0089 |
| 263 | 5.3849 | 0.0088 |
| 264 | 5.3937 | 0.0088 |
| 265 | 5.4025 | 0.0088 |
| 266 | 5.4113 | 0.0088 |
| 267 | 5.4201 | 0.0088 |
| 268 | 5.4288 | 0.0087 |
| 269 | 5.4375 | 0.0087 |
| 270 | 5.4462 | 0.0087 |
| 271 | 5.4549 | 0.0087 |
| 272 | 5.4636 | 0.0087 |
| 273 | 5.4722 | 0.0087 |
| 274 | 5.4809 | 0.0086 |
| 275 | 5.4895 | 0.0086 |
| 276 | 5.4981 | 0.0086 |
| 277 | 5.5067 | 0.0086 |
| 278 | 5.5152 | 0.0086 |
| 279 | 5.5238 | 0.0085 |
| 280 | 5.5323 | 0.0085 |
| 281 | 5.5408 | 0.0085 |
| 282 | 5.5493 | 0.0085 |
| 283 | 5.5578 | 0.0085 |
| 284 | 5.5663 | 0.0085 |
| 285 | 5.5747 | 0.0084 |
| 286 | 5.5831 | 0.0084 |
| 287 | 5.5916 | 0.0084 |
| 288 | 5.5999 | 0.0084 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0084 | 0.0010 | 0.0074 |
| 2 | 0.0084 | 0.0010 | 0.0074 |
| 3 | 0.0084 | 0.0010 | 0.0074 |
| 4 | 0.0085 | 0.0010 | 0.0075 |
| 5 | 0.0085 | 0.0010 | 0.0075 |
| 6 | 0.0085 | 0.0010 | 0.0075 |
| 7 | 0.0085 | 0.0010 | 0.0075 |
| 8 | 0.0086 | 0.0010 | 0.0075 |
| 9 | 0.0086 | 0.0010 | 0.0076 |
| 10 | 0.0086 | 0.0010 | 0.0076 |
| 11 | 0.0087 | 0.0010 | 0.0076 |
| 12 | 0.0087 | 0.0010 | 0.0076 |
| 13 | 0.0087 | 0.0010 | 0.0077 |
| 14 | 0.0087 | 0.0010 | 0.0077 |
| 15 | 0.0088 | 0.0010 | 0.0077 |
| 16 | 0.0088 | 0.0010 | 0.0077 |
| 17 | 0.0088 | 0.0010 | 0.0078 |
| 18 | 0.0088 | 0.0011 | 0.0078 |

| | | | |
|---|---|---|---|
| 19 | 0.0089 | 0.0011 | 0.0078 |
| 20 | 0.0089 | 0.0011 | 0.0078 |
| 21 | 0.0089 | 0.0011 | 0.0079 |
| 22 | 0.0090 | 0.0011 | 0.0079 |
| 23 | 0.0090 | 0.0011 | 0.0079 |
| 24 | 0.0090 | 0.0011 | 0.0079 |
| 25 | 0.0091 | 0.0011 | 0.0080 |
| 26 | 0.0091 | 0.0011 | 0.0080 |
| 27 | 0.0091 | 0.0011 | 0.0080 |
| 28 | 0.0091 | 0.0011 | 0.0081 |
| 29 | 0.0092 | 0.0011 | 0.0081 |
| 30 | 0.0092 | 0.0011 | 0.0081 |
| 31 | 0.0092 | 0.0011 | 0.0081 |
| 32 | 0.0093 | 0.0011 | 0.0082 |
| 33 | 0.0093 | 0.0011 | 0.0082 |
| 34 | 0.0093 | 0.0011 | 0.0082 |
| 35 | 0.0094 | 0.0011 | 0.0083 |
| 36 | 0.0094 | 0.0011 | 0.0083 |
| 37 | 0.0094 | 0.0011 | 0.0083 |
| 38 | 0.0095 | 0.0011 | 0.0083 |
| 39 | 0.0095 | 0.0011 | 0.0084 |
| 40 | 0.0095 | 0.0011 | 0.0084 |
| 41 | 0.0096 | 0.0011 | 0.0084 |
| 42 | 0.0096 | 0.0011 | 0.0085 |
| 43 | 0.0097 | 0.0011 | 0.0085 |
| 44 | 0.0097 | 0.0012 | 0.0085 |
| 45 | 0.0097 | 0.0012 | 0.0086 |
| 46 | 0.0098 | 0.0012 | 0.0086 |
| 47 | 0.0098 | 0.0012 | 0.0086 |
| 48 | 0.0098 | 0.0012 | 0.0087 |
| 49 | 0.0099 | 0.0012 | 0.0087 |
| 50 | 0.0099 | 0.0012 | 0.0087 |
| 51 | 0.0100 | 0.0012 | 0.0088 |
| 52 | 0.0100 | 0.0012 | 0.0088 |
| 53 | 0.0100 | 0.0012 | 0.0089 |
| 54 | 0.0101 | 0.0012 | 0.0089 |
| 55 | 0.0101 | 0.0012 | 0.0089 |
| 56 | 0.0102 | 0.0012 | 0.0090 |
| 57 | 0.0102 | 0.0012 | 0.0090 |
| 58 | 0.0102 | 0.0012 | 0.0090 |
| 59 | 0.0103 | 0.0012 | 0.0091 |
| 60 | 0.0103 | 0.0012 | 0.0091 |
| 61 | 0.0104 | 0.0012 | 0.0092 |
| 62 | 0.0104 | 0.0012 | 0.0092 |
| 63 | 0.0105 | 0.0012 | 0.0092 |
| 64 | 0.0105 | 0.0012 | 0.0093 |
| 65 | 0.0106 | 0.0013 | 0.0093 |
| 66 | 0.0106 | 0.0013 | 0.0093 |
| 67 | 0.0107 | 0.0013 | 0.0094 |
| 68 | 0.0107 | 0.0013 | 0.0094 |
| 69 | 0.0108 | 0.0013 | 0.0095 |
| 70 | 0.0108 | 0.0013 | 0.0095 |
| 71 | 0.0109 | 0.0013 | 0.0096 |
| 72 | 0.0109 | 0.0013 | 0.0096 |
| 73 | 0.0110 | 0.0013 | 0.0097 |
| 74 | 0.0110 | 0.0013 | 0.0097 |
| 75 | 0.0111 | 0.0013 | 0.0098 |
| 76 | 0.0111 | 0.0013 | 0.0098 |
| 77 | 0.0112 | 0.0013 | 0.0099 |
| 78 | 0.0112 | 0.0013 | 0.0099 |
| 79 | 0.0113 | 0.0013 | 0.0100 |
| 80 | 0.0113 | 0.0013 | 0.0100 |
| 81 | 0.0114 | 0.0014 | 0.0101 |
| 82 | 0.0115 | 0.0014 | 0.0101 |
| 83 | 0.0115 | 0.0014 | 0.0102 |
| 84 | 0.0116 | 0.0014 | 0.0102 |
| 85 | 0.0117 | 0.0014 | 0.0103 |
| 86 | 0.0117 | 0.0014 | 0.0103 |
| 87 | 0.0118 | 0.0014 | 0.0104 |
| 88 | 0.0118 | 0.0014 | 0.0104 |
| 89 | 0.0119 | 0.0014 | 0.0105 |

| | | | |
|---|---|---|---|
| 90 | 0.0119 | 0.0014 | 0.0105 |
| 91 | 0.0120 | 0.0014 | 0.0106 |
| 92 | 0.0121 | 0.0014 | 0.0106 |
| 93 | 0.0122 | 0.0014 | 0.0107 |
| 94 | 0.0122 | 0.0015 | 0.0108 |
| 95 | 0.0123 | 0.0015 | 0.0109 |
| 96 | 0.0124 | 0.0015 | 0.0109 |
| 97 | 0.0125 | 0.0015 | 0.0110 |
| 98 | 0.0125 | 0.0015 | 0.0110 |
| 99 | 0.0126 | 0.0015 | 0.0111 |
| 100 | 0.0127 | 0.0015 | 0.0112 |
| 101 | 0.0128 | 0.0015 | 0.0113 |
| 102 | 0.0128 | 0.0015 | 0.0113 |
| 103 | 0.0129 | 0.0015 | 0.0114 |
| 104 | 0.0130 | 0.0015 | 0.0114 |
| 105 | 0.0131 | 0.0016 | 0.0115 |
| 106 | 0.0132 | 0.0016 | 0.0116 |
| 107 | 0.0133 | 0.0016 | 0.0117 |
| 108 | 0.0133 | 0.0016 | 0.0117 |
| 109 | 0.0134 | 0.0016 | 0.0119 |
| 110 | 0.0135 | 0.0016 | 0.0119 |
| 111 | 0.0136 | 0.0016 | 0.0120 |
| 112 | 0.0137 | 0.0016 | 0.0121 |
| 113 | 0.0138 | 0.0016 | 0.0122 |
| 114 | 0.0139 | 0.0017 | 0.0122 |
| 115 | 0.0140 | 0.0017 | 0.0124 |
| 116 | 0.0141 | 0.0017 | 0.0124 |
| 117 | 0.0142 | 0.0017 | 0.0125 |
| 118 | 0.0143 | 0.0017 | 0.0126 |
| 119 | 0.0145 | 0.0017 | 0.0127 |
| 120 | 0.0145 | 0.0017 | 0.0128 |
| 121 | 0.0147 | 0.0017 | 0.0129 |
| 122 | 0.0148 | 0.0018 | 0.0130 |
| 123 | 0.0149 | 0.0018 | 0.0132 |
| 124 | 0.0150 | 0.0018 | 0.0132 |
| 125 | 0.0152 | 0.0018 | 0.0134 |
| 126 | 0.0153 | 0.0018 | 0.0134 |
| 127 | 0.0154 | 0.0018 | 0.0136 |
| 128 | 0.0155 | 0.0018 | 0.0137 |
| 129 | 0.0157 | 0.0019 | 0.0138 |
| 130 | 0.0158 | 0.0019 | 0.0139 |
| 131 | 0.0160 | 0.0019 | 0.0141 |
| 132 | 0.0161 | 0.0019 | 0.0142 |
| 133 | 0.0163 | 0.0019 | 0.0144 |
| 134 | 0.0164 | 0.0019 | 0.0145 |
| 135 | 0.0166 | 0.0020 | 0.0146 |
| 136 | 0.0167 | 0.0020 | 0.0147 |
| 137 | 0.0170 | 0.0020 | 0.0149 |
| 138 | 0.0171 | 0.0020 | 0.0150 |
| 139 | 0.0173 | 0.0021 | 0.0153 |
| 140 | 0.0174 | 0.0021 | 0.0154 |
| 141 | 0.0177 | 0.0021 | 0.0156 |
| 142 | 0.0178 | 0.0021 | 0.0157 |
| 143 | 0.0181 | 0.0021 | 0.0159 |
| 144 | 0.0182 | 0.0022 | 0.0161 |
| 145 | 0.0210 | 0.0025 | 0.0185 |
| 146 | 0.0212 | 0.0025 | 0.0187 |
| 147 | 0.0215 | 0.0026 | 0.0189 |
| 148 | 0.0217 | 0.0026 | 0.0191 |
| 149 | 0.0220 | 0.0026 | 0.0194 |
| 150 | 0.0222 | 0.0026 | 0.0195 |
| 151 | 0.0225 | 0.0027 | 0.0199 |
| 152 | 0.0227 | 0.0027 | 0.0200 |
| 153 | 0.0231 | 0.0027 | 0.0204 |
| 154 | 0.0233 | 0.0028 | 0.0205 |
| 155 | 0.0237 | 0.0028 | 0.0209 |
| 156 | 0.0239 | 0.0028 | 0.0211 |
| 157 | 0.0244 | 0.0029 | 0.0215 |
| 158 | 0.0246 | 0.0029 | 0.0217 |
| 159 | 0.0251 | 0.0030 | 0.0221 |
| 160 | 0.0254 | 0.0030 | 0.0224 |

| | | | |
|---|---|---|---|
| 161 | 0.0259 | 0.0031 | 0.0228 |
| 162 | 0.0262 | 0.0031 | 0.0231 |
| 163 | 0.0268 | 0.0032 | 0.0236 |
| 164 | 0.0271 | 0.0032 | 0.0239 |
| 165 | 0.0278 | 0.0033 | 0.0245 |
| 166 | 0.0281 | 0.0033 | 0.0248 |
| 167 | 0.0288 | 0.0034 | 0.0254 |
| 168 | 0.0292 | 0.0035 | 0.0258 |
| 169 | 0.0301 | 0.0036 | 0.0265 |
| 170 | 0.0305 | 0.0036 | 0.0269 |
| 171 | 0.0315 | 0.0037 | 0.0277 |
| 172 | 0.0320 | 0.0038 | 0.0282 |
| 173 | 0.0331 | 0.0039 | 0.0291 |
| 174 | 0.0336 | 0.0040 | 0.0296 |
| 175 | 0.0349 | 0.0041 | 0.0308 |
| 176 | 0.0356 | 0.0042 | 0.0314 |
| 177 | 0.0371 | 0.0044 | 0.0327 |
| 178 | 0.0380 | 0.0045 | 0.0334 |
| 179 | 0.0398 | 0.0047 | 0.0351 |
| 180 | 0.0408 | 0.0049 | 0.0360 |
| 181 | 0.0431 | 0.0051 | 0.0380 |
| 182 | 0.0445 | 0.0053 | 0.0392 |
| 183 | 0.0475 | 0.0056 | 0.0418 |
| 184 | 0.0492 | 0.0059 | 0.0434 |
| 185 | 0.0438 | 0.0052 | 0.0386 |
| 186 | 0.0462 | 0.0055 | 0.0407 |
| 187 | 0.0525 | 0.0062 | 0.0462 |
| 188 | 0.0566 | 0.0065 | 0.0500 |
| 189 | 0.0682 | 0.0065 | 0.0617 |
| 190 | 0.0770 | 0.0065 | 0.0704 |
| 191 | 0.1100 | 0.0065 | 0.1035 |
| 192 | 0.1513 | 0.0065 | 0.1448 |
| 193 | 0.4736 | 0.0065 | 0.4670 |
| 194 | 0.0896 | 0.0065 | 0.0831 |
| 195 | 0.0617 | 0.0065 | 0.0551 |
| 196 | 0.0491 | 0.0058 | 0.0433 |
| 197 | 0.0512 | 0.0061 | 0.0451 |
| 198 | 0.0459 | 0.0055 | 0.0404 |
| 199 | 0.0419 | 0.0050 | 0.0370 |
| 200 | 0.0388 | 0.0046 | 0.0342 |
| 201 | 0.0363 | 0.0043 | 0.0320 |
| 202 | 0.0343 | 0.0041 | 0.0302 |
| 203 | 0.0325 | 0.0039 | 0.0286 |
| 204 | 0.0310 | 0.0037 | 0.0273 |
| 205 | 0.0296 | 0.0035 | 0.0261 |
| 206 | 0.0285 | 0.0034 | 0.0251 |
| 207 | 0.0274 | 0.0033 | 0.0242 |
| 208 | 0.0265 | 0.0031 | 0.0233 |
| 209 | 0.0256 | 0.0030 | 0.0226 |
| 210 | 0.0249 | 0.0030 | 0.0219 |
| 211 | 0.0242 | 0.0029 | 0.0213 |
| 212 | 0.0235 | 0.0028 | 0.0207 |
| 213 | 0.0229 | 0.0027 | 0.0202 |
| 214 | 0.0224 | 0.0027 | 0.0197 |
| 215 | 0.0218 | 0.0026 | 0.0192 |
| 216 | 0.0213 | 0.0025 | 0.0188 |
| 217 | 0.0184 | 0.0022 | 0.0162 |
| 218 | 0.0180 | 0.0021 | 0.0158 |
| 219 | 0.0176 | 0.0021 | 0.0155 |
| 220 | 0.0172 | 0.0020 | 0.0151 |
| 221 | 0.0168 | 0.0020 | 0.0148 |
| 222 | 0.0165 | 0.0020 | 0.0145 |
| 223 | 0.0162 | 0.0019 | 0.0143 |
| 224 | 0.0159 | 0.0019 | 0.0140 |
| 225 | 0.0156 | 0.0019 | 0.0138 |
| 226 | 0.0153 | 0.0018 | 0.0135 |
| 227 | 0.0151 | 0.0018 | 0.0133 |
| 228 | 0.0148 | 0.0018 | 0.0131 |
| 229 | 0.0146 | 0.0017 | 0.0129 |
| 230 | 0.0144 | 0.0017 | 0.0127 |
| 231 | 0.0142 | 0.0017 | 0.0125 |

| | | | |
|---|---|---|---|
| 232 | 0.0140 | 0.0017 | 0.0123 |
| 233 | 0.0138 | 0.0016 | 0.0121 |
| 234 | 0.0136 | 0.0016 | 0.0120 |
| 235 | 0.0134 | 0.0016 | 0.0118 |
| 236 | 0.0132 | 0.0016 | 0.0116 |
| 237 | 0.0130 | 0.0015 | 0.0115 |
| 238 | 0.0129 | 0.0015 | 0.0113 |
| 239 | 0.0127 | 0.0015 | 0.0112 |
| 240 | 0.0126 | 0.0015 | 0.0111 |
| 241 | 0.0124 | 0.0015 | 0.0109 |
| 242 | 0.0123 | 0.0015 | 0.0108 |
| 243 | 0.0121 | 0.0014 | 0.0107 |
| 244 | 0.0120 | 0.0014 | 0.0106 |
| 245 | 0.0119 | 0.0014 | 0.0105 |
| 246 | 0.0117 | 0.0014 | 0.0103 |
| 247 | 0.0116 | 0.0014 | 0.0102 |
| 248 | 0.0115 | 0.0014 | 0.0101 |
| 249 | 0.0114 | 0.0014 | 0.0100 |
| 250 | 0.0113 | 0.0013 | 0.0099 |
| 251 | 0.0112 | 0.0013 | 0.0098 |
| 252 | 0.0110 | 0.0013 | 0.0097 |
| 253 | 0.0109 | 0.0013 | 0.0096 |
| 254 | 0.0108 | 0.0013 | 0.0095 |
| 255 | 0.0107 | 0.0013 | 0.0095 |
| 256 | 0.0106 | 0.0013 | 0.0094 |
| 257 | 0.0105 | 0.0013 | 0.0093 |
| 258 | 0.0105 | 0.0012 | 0.0092 |
| 259 | 0.0104 | 0.0012 | 0.0091 |
| 260 | 0.0103 | 0.0012 | 0.0091 |
| 261 | 0.0102 | 0.0012 | 0.0090 |
| 262 | 0.0101 | 0.0012 | 0.0089 |
| 263 | 0.0100 | 0.0012 | 0.0088 |
| 264 | 0.0099 | 0.0012 | 0.0088 |
| 265 | 0.0099 | 0.0012 | 0.0087 |
| 266 | 0.0098 | 0.0012 | 0.0086 |
| 267 | 0.0097 | 0.0012 | 0.0086 |
| 268 | 0.0096 | 0.0011 | 0.0085 |
| 269 | 0.0096 | 0.0011 | 0.0084 |
| 270 | 0.0095 | 0.0011 | 0.0084 |
| 271 | 0.0094 | 0.0011 | 0.0083 |
| 272 | 0.0094 | 0.0011 | 0.0082 |
| 273 | 0.0093 | 0.0011 | 0.0082 |
| 274 | 0.0092 | 0.0011 | 0.0081 |
| 275 | 0.0092 | 0.0011 | 0.0081 |
| 276 | 0.0091 | 0.0011 | 0.0080 |
| 277 | 0.0090 | 0.0011 | 0.0080 |
| 278 | 0.0090 | 0.0011 | 0.0079 |
| 279 | 0.0089 | 0.0011 | 0.0079 |
| 280 | 0.0089 | 0.0011 | 0.0078 |
| 281 | 0.0088 | 0.0010 | 0.0078 |
| 282 | 0.0087 | 0.0010 | 0.0077 |
| 283 | 0.0087 | 0.0010 | 0.0077 |
| 284 | 0.0086 | 0.0010 | 0.0076 |
| 285 | 0.0086 | 0.0010 | 0.0076 |
| 286 | 0.0085 | 0.0010 | 0.0075 |
| 287 | 0.0085 | 0.0010 | 0.0075 |
| 288 | 0.0084 | 0.0010 | 0.0074 |

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Total soil rain loss = 0.59(In)
Total effective rainfall = 5.01(In)
Peak flow rate in flood hydrograph = 23.24(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

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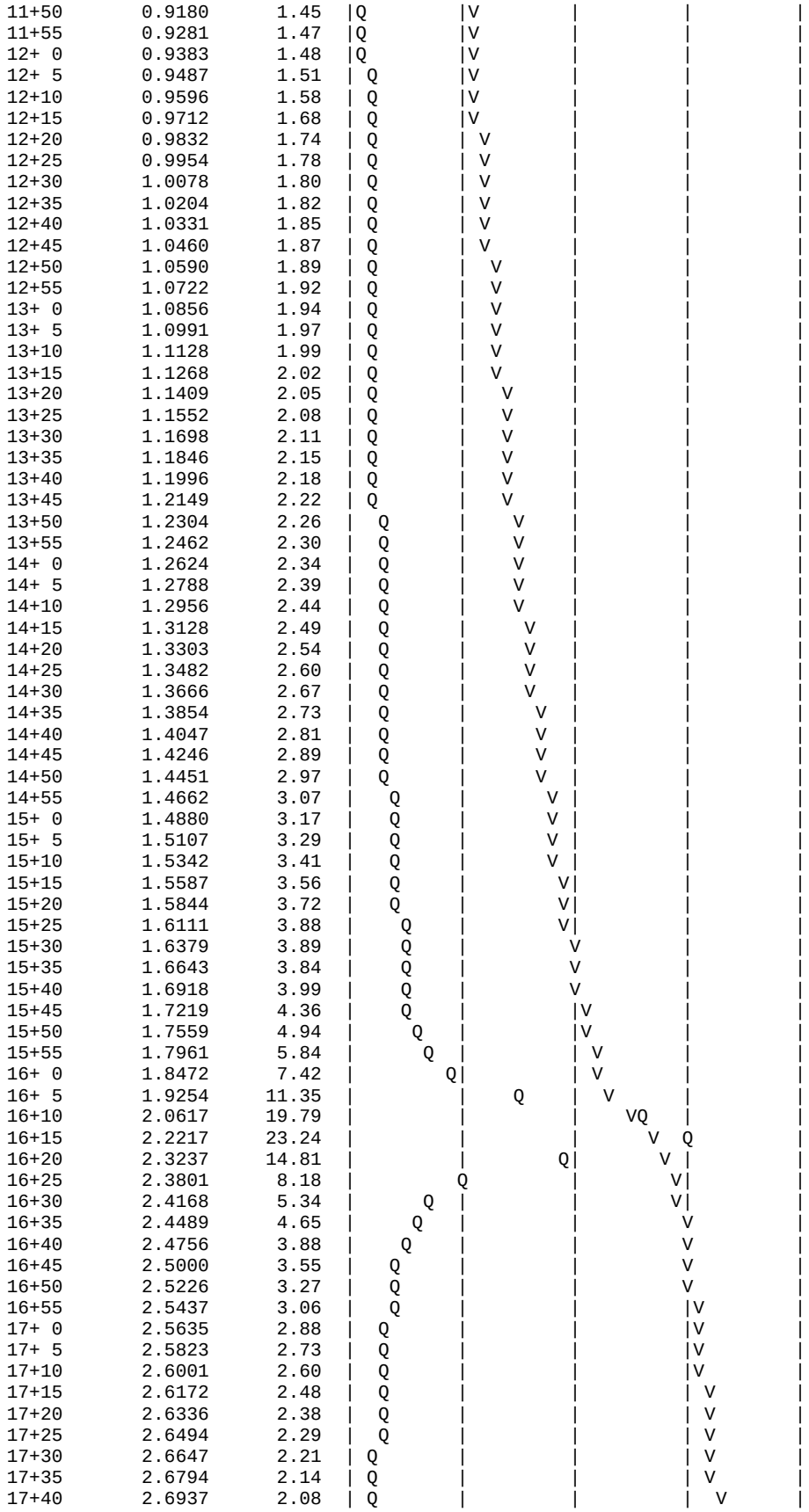
Hydrograph in 5 Minute intervals ((CFS))

---

Time(h+m) Volume Ac.Ft Q(CFS) 0 7.5 15.0 22.5 30.0

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0002 | 0.03 | Q | | | | |
| 0+10 | 0.0017 | 0.21 | Q | | | | |
| 0+15 | 0.0051 | 0.49 | Q | | | | |
| 0+20 | 0.0094 | 0.63 | Q | | | | |
| 0+25 | 0.0141 | 0.68 | Q | | | | |
| 0+30 | 0.0189 | 0.70 | Q | | | | |
| 0+35 | 0.0238 | 0.71 | Q | | | | |
| 0+40 | 0.0287 | 0.71 | Q | | | | |
| 0+45 | 0.0336 | 0.71 | Q | | | | |
| 0+50 | 0.0385 | 0.71 | Q | | | | |
| 0+55 | 0.0434 | 0.71 | Q | | | | |
| 1+ 0 | 0.0483 | 0.72 | Q | | | | |
| 1+ 5 | 0.0533 | 0.72 | Q | | | | |
| 1+10 | 0.0582 | 0.72 | Q | | | | |
| 1+15 | 0.0632 | 0.72 | Q | | | | |
| 1+20 | 0.0682 | 0.73 | Q | | | | |
| 1+25 | 0.0732 | 0.73 | Q | | | | |
| 1+30 | 0.0782 | 0.73 | Q | | | | |
| 1+35 | 0.0833 | 0.73 | QV | | | | |
| 1+40 | 0.0884 | 0.73 | QV | | | | |
| 1+45 | 0.0934 | 0.74 | QV | | | | |
| 1+50 | 0.0985 | 0.74 | QV | | | | |
| 1+55 | 0.1036 | 0.74 | QV | | | | |
| 2+ 0 | 0.1088 | 0.74 | QV | | | | |
| 2+ 5 | 0.1139 | 0.75 | QV | | | | |
| 2+10 | 0.1191 | 0.75 | QV | | | | |
| 2+15 | 0.1243 | 0.75 | \|Q | | | | |
| 2+20 | 0.1295 | 0.75 | \|Q | | | | |
| 2+25 | 0.1347 | 0.76 | \|Q | | | | |
| 2+30 | 0.1399 | 0.76 | \|Q | | | | |
| 2+35 | 0.1452 | 0.76 | \|Q | | | | |
| 2+40 | 0.1504 | 0.77 | \|Q | | | | |
| 2+45 | 0.1557 | 0.77 | \|Q | | | | |
| 2+50 | 0.1610 | 0.77 | \|Q | | | | |
| 2+55 | 0.1664 | 0.77 | \|QV | | | | |
| 3+ 0 | 0.1717 | 0.78 | \|QV | | | | |
| 3+ 5 | 0.1771 | 0.78 | \|QV | | | | |
| 3+10 | 0.1825 | 0.78 | \|QV | | | | |
| 3+15 | 0.1879 | 0.78 | \|QV | | | | |
| 3+20 | 0.1933 | 0.79 | \|QV | | | | |
| 3+25 | 0.1987 | 0.79 | \|QV | | | | |
| 3+30 | 0.2042 | 0.79 | \|QV | | | | |
| 3+35 | 0.2097 | 0.80 | \|QV | | | | |
| 3+40 | 0.2152 | 0.80 | \|QV | | | | |
| 3+45 | 0.2207 | 0.80 | \|QV | | | | |
| 3+50 | 0.2263 | 0.81 | \|QV | | | | |
| 3+55 | 0.2318 | 0.81 | \|QV | | | | |
| 4+ 0 | 0.2374 | 0.81 | \|QV | | | | |
| 4+ 5 | 0.2430 | 0.81 | \|QV | | | | |
| 4+10 | 0.2487 | 0.82 | \|Q V | | | | |
| 4+15 | 0.2543 | 0.82 | \|Q V | | | | |
| 4+20 | 0.2600 | 0.82 | \|Q V | | | | |
| 4+25 | 0.2657 | 0.83 | \|Q V | | | | |
| 4+30 | 0.2714 | 0.83 | \|Q V | | | | |
| 4+35 | 0.2772 | 0.83 | \|Q V | | | | |
| 4+40 | 0.2829 | 0.84 | \|Q V | | | | |
| 4+45 | 0.2887 | 0.84 | \|Q V | | | | |
| 4+50 | 0.2945 | 0.84 | \|Q V | | | | |
| 4+55 | 0.3004 | 0.85 | \|Q V | | | | |
| 5+ 0 | 0.3063 | 0.85 | \|Q V | | | | |
| 5+ 5 | 0.3121 | 0.86 | \|Q V | | | | |
| 5+10 | 0.3181 | 0.86 | \|Q V | | | | |
| 5+15 | 0.3240 | 0.86 | \|Q V | | | | |
| 5+20 | 0.3300 | 0.87 | \|Q  V | | | | |
| 5+25 | 0.3360 | 0.87 | \|Q  V | | | | |
| 5+30 | 0.3420 | 0.87 | \|Q  V | | | | |
| 5+35 | 0.3480 | 0.88 | \|Q  V | | | | |
| 5+40 | 0.3541 | 0.88 | \|Q  V | | | | |
| 5+45 | 0.3602 | 0.89 | \|Q  V | | | | |
| 5+50 | 0.3664 | 0.89 | \|Q  V | | | | |

```
 5+55       0.3725      0.89  |Q  V     |         |         |         |
 6+ 0       0.3787      0.90  |Q  V     |         |         |         |
 6+ 5       0.3849      0.90  |Q  V     |         |         |         |
 6+10       0.3912      0.91  |Q  V     |         |         |         |
 6+15       0.3974      0.91  |Q  V     |         |         |         |
 6+20       0.4037      0.92  |Q  V     |         |         |         |
 6+25       0.4101      0.92  |Q   V    |         |         |         |
 6+30       0.4164      0.92  |Q   V    |         |         |         |
 6+35       0.4228      0.93  |Q   V    |         |         |         |
 6+40       0.4293      0.93  |Q   V    |         |         |         |
 6+45       0.4357      0.94  |Q   V    |         |         |         |
 6+50       0.4422      0.94  |Q   V    |         |         |         |
 6+55       0.4487      0.95  |Q   V    |         |         |         |
 7+ 0       0.4553      0.95  |Q   V    |         |         |         |
 7+ 5       0.4619      0.96  |Q   V    |         |         |         |
 7+10       0.4685      0.96  |Q   V    |         |         |         |
 7+15       0.4752      0.97  |Q   V    |         |         |         |
 7+20       0.4819      0.97  |Q   V    |         |         |         |
 7+25       0.4886      0.98  |Q    V   |         |         |         |
 7+30       0.4954      0.98  |Q    V   |         |         |         |
 7+35       0.5022      0.99  |Q    V   |         |         |         |
 7+40       0.5090      0.99  |Q    V   |         |         |         |
 7+45       0.5159      1.00  |Q    V   |         |         |         |
 7+50       0.5228      1.00  |Q    V   |         |         |         |
 7+55       0.5298      1.01  |Q    V   |         |         |         |
 8+ 0       0.5368      1.02  |Q    V   |         |         |         |
 8+ 5       0.5438      1.02  |Q    V   |         |         |         |
 8+10       0.5509      1.03  |Q    V   |         |         |         |
 8+15       0.5580      1.03  |Q    V   |         |         |         |
 8+20       0.5652      1.04  |Q    V   |         |         |         |
 8+25       0.5724      1.05  |Q     V  |         |         |         |
 8+30       0.5797      1.05  |Q     V  |         |         |         |
 8+35       0.5870      1.06  |Q     V  |         |         |         |
 8+40       0.5943      1.07  |Q     V  |         |         |         |
 8+45       0.6017      1.07  |Q     V  |         |         |         |
 8+50       0.6092      1.08  |Q     V  |         |         |         |
 8+55       0.6166      1.09  |Q     V  |         |         |         |
 9+ 0       0.6242      1.09  |Q     V  |         |         |         |
 9+ 5       0.6318      1.10  |Q     V  |         |         |         |
 9+10       0.6394      1.11  |Q     V  |         |         |         |
 9+15       0.6471      1.12  |Q     V  |         |         |         |
 9+20       0.6548      1.12  |Q      V |         |         |         |
 9+25       0.6626      1.13  |Q      V |         |         |         |
 9+30       0.6705      1.14  |Q      V |         |         |         |
 9+35       0.6784      1.15  |Q      V |         |         |         |
 9+40       0.6863      1.16  |Q      V |         |         |         |
 9+45       0.6943      1.16  |Q      V |         |         |         |
 9+50       0.7024      1.17  |Q      V |         |         |         |
 9+55       0.7106      1.18  |Q      V |         |         |         |
10+ 0       0.7188      1.19  |Q      V |         |         |         |
10+ 5       0.7270      1.20  |Q      V |         |         |         |
10+10       0.7354      1.21  |Q       V|         |         |         |
10+15       0.7437      1.22  |Q       V|         |         |         |
10+20       0.7522      1.23  |Q       V|         |         |         |
10+25       0.7607      1.24  |Q       V|         |         |         |
10+30       0.7693      1.25  |Q       V|         |         |         |
10+35       0.7780      1.26  |Q       V|         |         |         |
10+40       0.7867      1.27  |Q       V|         |         |         |
10+45       0.7956      1.28  |Q       V|         |         |         |
10+50       0.8045      1.29  |Q       V|         |         |         |
10+55       0.8134      1.30  |Q       V|         |         |         |
11+ 0       0.8225      1.31  |Q        V         |         |         |
11+ 5       0.8316      1.33  |Q        V         |         |         |
11+10       0.8409      1.34  |Q        V         |         |         |
11+15       0.8502      1.35  |Q        V         |         |         |
11+20       0.8596      1.36  |Q        V         |         |         |
11+25       0.8691      1.38  |Q        V         |         |         |
11+30       0.8786      1.39  |Q        V         |         |         |
11+35       0.8883      1.41  |Q        V         |         |         |
11+40       0.8981      1.42  |Q        |V        |         |         |
11+45       0.9080      1.44  |Q        |V        |         |         |
```



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17+45 | 2.7076 | 2.02 | Q | | | V | |
| 17+50 | 2.7211 | 1.96 | Q | | | V | |
| 17+55 | 2.7343 | 1.91 | Q | | | V | |
| 18+ 0 | 2.7471 | 1.86 | Q | | | V | |
| 18+ 5 | 2.7596 | 1.81 | Q | | | V | |
| 18+10 | 2.7714 | 1.71 | Q | | | V | |
| 18+15 | 2.7823 | 1.59 | Q | | | V | |
| 18+20 | 2.7928 | 1.52 | Q | | | V | |
| 18+25 | 2.8029 | 1.47 | Q | | | V | |
| 18+30 | 2.8128 | 1.43 | Q | | | V | |
| 18+35 | 2.8225 | 1.40 | Q | | | V | |
| 18+40 | 2.8319 | 1.38 | Q | | | V | |
| 18+45 | 2.8412 | 1.35 | Q | | | V | |
| 18+50 | 2.8503 | 1.32 | Q | | | V | |
| 18+55 | 2.8593 | 1.30 | Q | | | V | |
| 19+ 0 | 2.8681 | 1.28 | Q | | | V | |
| 19+ 5 | 2.8768 | 1.26 | Q | | | V | |
| 19+10 | 2.8853 | 1.24 | Q | | | V | |
| 19+15 | 2.8936 | 1.22 | Q | | | V | |
| 19+20 | 2.9019 | 1.20 | Q | | | V | |
| 19+25 | 2.9100 | 1.18 | Q | | | V | |
| 19+30 | 2.9180 | 1.16 | Q | | | V | |
| 19+35 | 2.9259 | 1.15 | Q | | | V | |
| 19+40 | 2.9337 | 1.13 | Q | | | V | |
| 19+45 | 2.9414 | 1.11 | Q | | | V | |
| 19+50 | 2.9489 | 1.10 | Q | | | V | |
| 19+55 | 2.9564 | 1.09 | Q | | | V | |
| 20+ 0 | 2.9638 | 1.07 | Q | | | V | |
| 20+ 5 | 2.9711 | 1.06 | Q | | | V | |
| 20+10 | 2.9783 | 1.05 | Q | | | V | |
| 20+15 | 2.9854 | 1.03 | Q | | | V | |
| 20+20 | 2.9924 | 1.02 | Q | | | V | |
| 20+25 | 2.9994 | 1.01 | Q | | | V | |
| 20+30 | 3.0063 | 1.00 | Q | | | V | |
| 20+35 | 3.0131 | 0.99 | Q | | | V | |
| 20+40 | 3.0198 | 0.98 | Q | | | V | |
| 20+45 | 3.0264 | 0.97 | Q | | | V | |
| 20+50 | 3.0330 | 0.96 | Q | | | V | |
| 20+55 | 3.0395 | 0.95 | Q | | | V | |
| 21+ 0 | 3.0460 | 0.94 | Q | | | V | |
| 21+ 5 | 3.0524 | 0.93 | Q | | | V | |
| 21+10 | 3.0587 | 0.92 | Q | | | V | |
| 21+15 | 3.0650 | 0.91 | Q | | | V | |
| 21+20 | 3.0712 | 0.90 | Q | | | V | |
| 21+25 | 3.0773 | 0.89 | Q | | | V | |
| 21+30 | 3.0834 | 0.89 | Q | | | V | |
| 21+35 | 3.0895 | 0.88 | Q | | | V | |
| 21+40 | 3.0955 | 0.87 | Q | | | V | |
| 21+45 | 3.1014 | 0.86 | Q | | | V | |
| 21+50 | 3.1073 | 0.85 | Q | | | V | |
| 21+55 | 3.1131 | 0.85 | Q | | | V | |
| 22+ 0 | 3.1189 | 0.84 | Q | | | V | |
| 22+ 5 | 3.1247 | 0.83 | Q | | | V | |
| 22+10 | 3.1304 | 0.83 | Q | | | V | |
| 22+15 | 3.1360 | 0.82 | Q | | | V | |
| 22+20 | 3.1416 | 0.81 | Q | | | V | |
| 22+25 | 3.1472 | 0.81 | Q | | | V | |
| 22+30 | 3.1527 | 0.80 | Q | | | V | |
| 22+35 | 3.1582 | 0.80 | Q | | | V | |
| 22+40 | 3.1636 | 0.79 | Q | | | V | |
| 22+45 | 3.1690 | 0.78 | Q | | | V | |
| 22+50 | 3.1744 | 0.78 | Q | | | V | |
| 22+55 | 3.1797 | 0.77 | Q | | | V | |
| 23+ 0 | 3.1850 | 0.77 | Q | | | V | |
| 23+ 5 | 3.1902 | 0.76 | Q | | | V | |
| 23+10 | 3.1954 | 0.76 | Q | | | V | |
| 23+15 | 3.2006 | 0.75 | Q | | | V | |
| 23+20 | 3.2058 | 0.75 | Q | | | V | |
| 23+25 | 3.2109 | 0.74 | Q | | | V | |
| 23+30 | 3.2159 | 0.74 | Q | | | V | |
| 23+35 | 3.2210 | 0.73 | Q | | | V | |

```
   23+40       3.2260      0.73  Q         |         |         |        V|
   23+45       3.2310      0.72  Q         |         |         |        V|
   23+50       3.2359      0.72  Q         |         |         |        V|
   23+55       3.2408      0.71  Q         |         |         |        V|
   24+ 0       3.2457      0.71  Q         |         |         |        V|
   24+ 5       3.2503      0.67  Q         |         |         |        V|
   24+10       3.2537      0.49  Q         |         |         |        V|
   24+15       3.2551      0.21  Q         |         |         |        V|
   24+20       3.2556      0.07  Q         |         |         |        V|
   24+25       3.2557      0.02  Q         |         |         |        V|
   24+30       3.2558      0.01  Q         |         |         |         V
-------------------------------------------------------------------------
```

# Unit Hydrograph Analysis: Existing Condition (100 yr, 24 hr Storm Event)

```
       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 - 2018, Version 9.0

              Study date  06/19/23

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

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


Program License Serial Number 6484

------------------------------------------------------------------------
UH ANALYSIS
EXISTING CONDITION
100-YR STORM EVENT

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

       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        Duration        Isohyetal
       (Ac.)            (hours)         (In)
Rainfall data for year 100
            7.80            1           1.00
------------------------------------------------------------------------
Rainfall data for year 100
            7.80            6           2.47
------------------------------------------------------------------------
Rainfall data for year 100
            7.80           24           4.52
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      32.0          7.80      1.000     0.978    0.594    0.581

Area-averaged adjusted loss rate Fm (In/Hr) =  0.581

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     4.63   0.594         32.0      32.0      21.25     0.001
     3.17   0.406         98.0      98.0       0.20     0.948

Area-averaged catchment yield fraction, Y =  0.385
Area-averaged low loss fraction, Yb =  0.615
Direct entry of lag time by user
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Watershed area = 7.80(Ac.)
Catchment Lag time = 0.212 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 39.2711
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.581(In/Hr)
Average low loss rate fraction (Yb) = 0.615 (decimal)
VALLEY DEVELOPED S-Graph proportion = 0.300
VALLEY UNDEVELOPED S-Graph proportion = 0.700
FOOTHILL S-Graph proportion = 0.000
MOUNTAIN S-Graph proportion = 0.000
DESERT S-Graph proportion = 0.000

Computed peak 5-minute rainfall = 0.369(In)
Computed peak 30-minute rainfall = 0.756(In)
Specified peak 1-hour rainfall = 0.997(In)
Computed peak 3-hour rainfall = 1.739(In)
Specified peak 6-hour rainfall = 2.470(In)
Specified peak 24-hour rainfall = 4.520(In)

Rainfall depth area reduction factors:
Using a total area of 7.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.369(In)
30-minute factor = 1.000 Adjusted rainfall = 0.755(In)
1-hour factor = 1.000 Adjusted rainfall = 0.997(In)
3-hour factor = 1.000 Adjusted rainfall = 1.739(In)
6-hour factor = 1.000 Adjusted rainfall = 2.470(In)
24-hour factor = 1.000 Adjusted rainfall = 4.520(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 = 94.33 (CFS)) | |
| 1 | 3.850 | 3.632 |
| 2 | 20.757 | 15.948 |
| 3 | 47.935 | 25.638 |
| 4 | 68.988 | 19.860 |
| 5 | 79.273 | 9.702 |
| 6 | 84.829 | 5.241 |
| 7 | 88.269 | 3.245 |
| 8 | 90.683 | 2.278 |
| 9 | 92.668 | 1.872 |
| 10 | 94.061 | 1.314 |
| 11 | 95.161 | 1.038 |
| 12 | 96.038 | 0.828 |
| 13 | 96.861 | 0.776 |
| 14 | 97.524 | 0.626 |
| 15 | 98.075 | 0.519 |
| 16 | 98.541 | 0.440 |
| 17 | 98.919 | 0.357 |
| 18 | 99.211 | 0.275 |
| 19 | 99.486 | 0.259 |
| 20 | 99.761 | 0.259 |
| 21 | 100.000 | 0.226 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3689 | 0.3689 |
| 2 | 0.4867 | 0.1179 |
| 3 | 0.5724 | 0.0857 |
| 4 | 0.6422 | 0.0698 |
| 5 | 0.7022 | 0.0600 |
| 6 | 0.7553 | 0.0531 |
| 7 | 0.8033 | 0.0480 |
| 8 | 0.8474 | 0.0441 |

| | | |
|---|---|---|
| 9 | 0.8883 | 0.0409 |
| 10 | 0.9265 | 0.0382 |
| 11 | 0.9625 | 0.0360 |
| 12 | 0.9966 | 0.0341 |
| 13 | 1.0379 | 0.0412 |
| 14 | 1.0776 | 0.0397 |
| 15 | 1.1159 | 0.0383 |
| 16 | 1.1530 | 0.0371 |
| 17 | 1.1890 | 0.0360 |
| 18 | 1.2239 | 0.0349 |
| 19 | 1.2579 | 0.0340 |
| 20 | 1.2910 | 0.0331 |
| 21 | 1.3233 | 0.0323 |
| 22 | 1.3549 | 0.0316 |
| 23 | 1.3857 | 0.0309 |
| 24 | 1.4159 | 0.0302 |
| 25 | 1.4455 | 0.0296 |
| 26 | 1.4745 | 0.0290 |
| 27 | 1.5030 | 0.0285 |
| 28 | 1.5310 | 0.0279 |
| 29 | 1.5584 | 0.0275 |
| 30 | 1.5854 | 0.0270 |
| 31 | 1.6120 | 0.0266 |
| 32 | 1.6381 | 0.0261 |
| 33 | 1.6638 | 0.0257 |
| 34 | 1.6892 | 0.0254 |
| 35 | 1.7142 | 0.0250 |
| 36 | 1.7388 | 0.0246 |
| 37 | 1.7631 | 0.0243 |
| 38 | 1.7871 | 0.0240 |
| 39 | 1.8107 | 0.0237 |
| 40 | 1.8341 | 0.0234 |
| 41 | 1.8572 | 0.0231 |
| 42 | 1.8800 | 0.0228 |
| 43 | 1.9025 | 0.0225 |
| 44 | 1.9248 | 0.0223 |
| 45 | 1.9468 | 0.0220 |
| 46 | 1.9686 | 0.0218 |
| 47 | 1.9902 | 0.0216 |
| 48 | 2.0115 | 0.0213 |
| 49 | 2.0326 | 0.0211 |
| 50 | 2.0535 | 0.0209 |
| 51 | 2.0742 | 0.0207 |
| 52 | 2.0947 | 0.0205 |
| 53 | 2.1150 | 0.0203 |
| 54 | 2.1351 | 0.0201 |
| 55 | 2.1550 | 0.0199 |
| 56 | 2.1748 | 0.0198 |
| 57 | 2.1944 | 0.0196 |
| 58 | 2.2138 | 0.0194 |
| 59 | 2.2330 | 0.0192 |
| 60 | 2.2521 | 0.0191 |
| 61 | 2.2711 | 0.0189 |
| 62 | 2.2898 | 0.0188 |
| 63 | 2.3085 | 0.0186 |
| 64 | 2.3269 | 0.0185 |
| 65 | 2.3453 | 0.0183 |
| 66 | 2.3635 | 0.0182 |
| 67 | 2.3815 | 0.0181 |
| 68 | 2.3995 | 0.0179 |
| 69 | 2.4173 | 0.0178 |
| 70 | 2.4350 | 0.0177 |
| 71 | 2.4525 | 0.0176 |
| 72 | 2.4699 | 0.0174 |
| 73 | 2.4848 | 0.0149 |
| 74 | 2.4996 | 0.0148 |
| 75 | 2.5143 | 0.0147 |
| 76 | 2.5288 | 0.0146 |
| 77 | 2.5433 | 0.0145 |
| 78 | 2.5576 | 0.0143 |
| 79 | 2.5719 | 0.0142 |

| | | |
|---|---|---|
| 80 | 2.5860 | 0.0141 |
| 81 | 2.6001 | 0.0140 |
| 82 | 2.6140 | 0.0139 |
| 83 | 2.6279 | 0.0138 |
| 84 | 2.6416 | 0.0138 |
| 85 | 2.6553 | 0.0137 |
| 86 | 2.6689 | 0.0136 |
| 87 | 2.6823 | 0.0135 |
| 88 | 2.6957 | 0.0134 |
| 89 | 2.7090 | 0.0133 |
| 90 | 2.7223 | 0.0132 |
| 91 | 2.7354 | 0.0131 |
| 92 | 2.7485 | 0.0131 |
| 93 | 2.7615 | 0.0130 |
| 94 | 2.7744 | 0.0129 |
| 95 | 2.7872 | 0.0128 |
| 96 | 2.7999 | 0.0128 |
| 97 | 2.8126 | 0.0127 |
| 98 | 2.8252 | 0.0126 |
| 99 | 2.8378 | 0.0125 |
| 100 | 2.8502 | 0.0125 |
| 101 | 2.8626 | 0.0124 |
| 102 | 2.8749 | 0.0123 |
| 103 | 2.8872 | 0.0123 |
| 104 | 2.8994 | 0.0122 |
| 105 | 2.9115 | 0.0121 |
| 106 | 2.9235 | 0.0121 |
| 107 | 2.9355 | 0.0120 |
| 108 | 2.9475 | 0.0119 |
| 109 | 2.9593 | 0.0119 |
| 110 | 2.9711 | 0.0118 |
| 111 | 2.9829 | 0.0117 |
| 112 | 2.9946 | 0.0117 |
| 113 | 3.0062 | 0.0116 |
| 114 | 3.0177 | 0.0116 |
| 115 | 3.0293 | 0.0115 |
| 116 | 3.0407 | 0.0115 |
| 117 | 3.0521 | 0.0114 |
| 118 | 3.0635 | 0.0113 |
| 119 | 3.0747 | 0.0113 |
| 120 | 3.0860 | 0.0112 |
| 121 | 3.0972 | 0.0112 |
| 122 | 3.1083 | 0.0111 |
| 123 | 3.1194 | 0.0111 |
| 124 | 3.1304 | 0.0110 |
| 125 | 3.1414 | 0.0110 |
| 126 | 3.1523 | 0.0109 |
| 127 | 3.1632 | 0.0109 |
| 128 | 3.1740 | 0.0108 |
| 129 | 3.1848 | 0.0108 |
| 130 | 3.1956 | 0.0107 |
| 131 | 3.2063 | 0.0107 |
| 132 | 3.2169 | 0.0106 |
| 133 | 3.2275 | 0.0106 |
| 134 | 3.2381 | 0.0106 |
| 135 | 3.2486 | 0.0105 |
| 136 | 3.2590 | 0.0105 |
| 137 | 3.2695 | 0.0104 |
| 138 | 3.2798 | 0.0104 |
| 139 | 3.2902 | 0.0103 |
| 140 | 3.3005 | 0.0103 |
| 141 | 3.3107 | 0.0103 |
| 142 | 3.3210 | 0.0102 |
| 143 | 3.3311 | 0.0102 |
| 144 | 3.3413 | 0.0101 |
| 145 | 3.3514 | 0.0101 |
| 146 | 3.3614 | 0.0101 |
| 147 | 3.3714 | 0.0100 |
| 148 | 3.3814 | 0.0100 |
| 149 | 3.3913 | 0.0099 |
| 150 | 3.4012 | 0.0099 |

| | | |
|---|---|---|
| 151 | 3.4111 | 0.0099 |
| 152 | 3.4209 | 0.0098 |
| 153 | 3.4307 | 0.0098 |
| 154 | 3.4405 | 0.0098 |
| 155 | 3.4502 | 0.0097 |
| 156 | 3.4599 | 0.0097 |
| 157 | 3.4696 | 0.0097 |
| 158 | 3.4792 | 0.0096 |
| 159 | 3.4887 | 0.0096 |
| 160 | 3.4983 | 0.0095 |
| 161 | 3.5078 | 0.0095 |
| 162 | 3.5173 | 0.0095 |
| 163 | 3.5267 | 0.0094 |
| 164 | 3.5362 | 0.0094 |
| 165 | 3.5455 | 0.0094 |
| 166 | 3.5549 | 0.0094 |
| 167 | 3.5642 | 0.0093 |
| 168 | 3.5735 | 0.0093 |
| 169 | 3.5828 | 0.0093 |
| 170 | 3.5920 | 0.0092 |
| 171 | 3.6012 | 0.0092 |
| 172 | 3.6103 | 0.0092 |
| 173 | 3.6195 | 0.0091 |
| 174 | 3.6286 | 0.0091 |
| 175 | 3.6377 | 0.0091 |
| 176 | 3.6467 | 0.0090 |
| 177 | 3.6557 | 0.0090 |
| 178 | 3.6647 | 0.0090 |
| 179 | 3.6737 | 0.0090 |
| 180 | 3.6826 | 0.0089 |
| 181 | 3.6915 | 0.0089 |
| 182 | 3.7004 | 0.0089 |
| 183 | 3.7092 | 0.0088 |
| 184 | 3.7181 | 0.0088 |
| 185 | 3.7269 | 0.0088 |
| 186 | 3.7356 | 0.0088 |
| 187 | 3.7444 | 0.0087 |
| 188 | 3.7531 | 0.0087 |
| 189 | 3.7618 | 0.0087 |
| 190 | 3.7704 | 0.0087 |
| 191 | 3.7791 | 0.0086 |
| 192 | 3.7877 | 0.0086 |
| 193 | 3.7963 | 0.0086 |
| 194 | 3.8048 | 0.0086 |
| 195 | 3.8134 | 0.0085 |
| 196 | 3.8219 | 0.0085 |
| 197 | 3.8304 | 0.0085 |
| 198 | 3.8388 | 0.0085 |
| 199 | 3.8473 | 0.0084 |
| 200 | 3.8557 | 0.0084 |
| 201 | 3.8641 | 0.0084 |
| 202 | 3.8724 | 0.0084 |
| 203 | 3.8808 | 0.0083 |
| 204 | 3.8891 | 0.0083 |
| 205 | 3.8974 | 0.0083 |
| 206 | 3.9057 | 0.0083 |
| 207 | 3.9139 | 0.0083 |
| 208 | 3.9222 | 0.0082 |
| 209 | 3.9304 | 0.0082 |
| 210 | 3.9386 | 0.0082 |
| 211 | 3.9467 | 0.0082 |
| 212 | 3.9549 | 0.0081 |
| 213 | 3.9630 | 0.0081 |
| 214 | 3.9711 | 0.0081 |
| 215 | 3.9792 | 0.0081 |
| 216 | 3.9872 | 0.0081 |
| 217 | 3.9953 | 0.0080 |
| 218 | 4.0033 | 0.0080 |
| 219 | 4.0113 | 0.0080 |
| 220 | 4.0193 | 0.0080 |
| 221 | 4.0272 | 0.0080 |

| | | | |
|---|---|---|---|
| 222 | 4.0351 | 0.0079 | |
| 223 | 4.0431 | 0.0079 | |
| 224 | 4.0509 | 0.0079 | |
| 225 | 4.0588 | 0.0079 | |
| 226 | 4.0667 | 0.0079 | |
| 227 | 4.0745 | 0.0078 | |
| 228 | 4.0823 | 0.0078 | |
| 229 | 4.0901 | 0.0078 | |
| 230 | 4.0979 | 0.0078 | |
| 231 | 4.1056 | 0.0078 | |
| 232 | 4.1134 | 0.0077 | |
| 233 | 4.1211 | 0.0077 | |
| 234 | 4.1288 | 0.0077 | |
| 235 | 4.1365 | 0.0077 | |
| 236 | 4.1442 | 0.0077 | |
| 237 | 4.1518 | 0.0076 | |
| 238 | 4.1594 | 0.0076 | |
| 239 | 4.1670 | 0.0076 | |
| 240 | 4.1746 | 0.0076 | |
| 241 | 4.1822 | 0.0076 | |
| 242 | 4.1898 | 0.0076 | |
| 243 | 4.1973 | 0.0075 | |
| 244 | 4.2048 | 0.0075 | |
| 245 | 4.2123 | 0.0075 | |
| 246 | 4.2198 | 0.0075 | |
| 247 | 4.2273 | 0.0075 | |
| 248 | 4.2347 | 0.0075 | |
| 249 | 4.2422 | 0.0074 | |
| 250 | 4.2496 | 0.0074 | |
| 251 | 4.2570 | 0.0074 | |
| 252 | 4.2644 | 0.0074 | |
| 253 | 4.2717 | 0.0074 | |
| 254 | 4.2791 | 0.0074 | |
| 255 | 4.2864 | 0.0073 | |
| 256 | 4.2937 | 0.0073 | |
| 257 | 4.3010 | 0.0073 | |
| 258 | 4.3083 | 0.0073 | |
| 259 | 4.3156 | 0.0073 | |
| 260 | 4.3229 | 0.0073 | |
| 261 | 4.3301 | 0.0072 | |
| 262 | 4.3373 | 0.0072 | |
| 263 | 4.3445 | 0.0072 | |
| 264 | 4.3517 | 0.0072 | |
| 265 | 4.3589 | 0.0072 | |
| 266 | 4.3661 | 0.0072 | |
| 267 | 4.3732 | 0.0071 | |
| 268 | 4.3803 | 0.0071 | |
| 269 | 4.3875 | 0.0071 | |
| 270 | 4.3946 | 0.0071 | |
| 271 | 4.4017 | 0.0071 | |
| 272 | 4.4087 | 0.0071 | |
| 273 | 4.4158 | 0.0071 | |
| 274 | 4.4228 | 0.0070 | |
| 275 | 4.4299 | 0.0070 | |
| 276 | 4.4369 | 0.0070 | |
| 277 | 4.4439 | 0.0070 | |
| 278 | 4.4509 | 0.0070 | |
| 279 | 4.4578 | 0.0070 | |
| 280 | 4.4648 | 0.0070 | |
| 281 | 4.4717 | 0.0069 | |
| 282 | 4.4787 | 0.0069 | |
| 283 | 4.4856 | 0.0069 | |
| 284 | 4.4925 | 0.0069 | |
| 285 | 4.4994 | 0.0069 | |
| 286 | 4.5062 | 0.0069 | |
| 287 | 4.5131 | 0.0069 | |
| 288 | 4.5200 | 0.0068 | |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | 0.0068 | 0.0042 | 0.0026 |
| 2 | 0.0069 | 0.0042 | 0.0026 |
| 3 | 0.0069 | 0.0042 | 0.0027 |
| 4 | 0.0069 | 0.0042 | 0.0027 |
| 5 | 0.0069 | 0.0043 | 0.0027 |
| 6 | 0.0069 | 0.0043 | 0.0027 |
| 7 | 0.0070 | 0.0043 | 0.0027 |
| 8 | 0.0070 | 0.0043 | 0.0027 |
| 9 | 0.0070 | 0.0043 | 0.0027 |
| 10 | 0.0070 | 0.0043 | 0.0027 |
| 11 | 0.0071 | 0.0043 | 0.0027 |
| 12 | 0.0071 | 0.0043 | 0.0027 |
| 13 | 0.0071 | 0.0044 | 0.0027 |
| 14 | 0.0071 | 0.0044 | 0.0027 |
| 15 | 0.0071 | 0.0044 | 0.0028 |
| 16 | 0.0072 | 0.0044 | 0.0028 |
| 17 | 0.0072 | 0.0044 | 0.0028 |
| 18 | 0.0072 | 0.0044 | 0.0028 |
| 19 | 0.0072 | 0.0045 | 0.0028 |
| 20 | 0.0073 | 0.0045 | 0.0028 |
| 21 | 0.0073 | 0.0045 | 0.0028 |
| 22 | 0.0073 | 0.0045 | 0.0028 |
| 23 | 0.0073 | 0.0045 | 0.0028 |
| 24 | 0.0074 | 0.0045 | 0.0028 |
| 25 | 0.0074 | 0.0045 | 0.0028 |
| 26 | 0.0074 | 0.0046 | 0.0029 |
| 27 | 0.0074 | 0.0046 | 0.0029 |
| 28 | 0.0075 | 0.0046 | 0.0029 |
| 29 | 0.0075 | 0.0046 | 0.0029 |
| 30 | 0.0075 | 0.0046 | 0.0029 |
| 31 | 0.0075 | 0.0046 | 0.0029 |
| 32 | 0.0076 | 0.0046 | 0.0029 |
| 33 | 0.0076 | 0.0047 | 0.0029 |
| 34 | 0.0076 | 0.0047 | 0.0029 |
| 35 | 0.0076 | 0.0047 | 0.0029 |
| 36 | 0.0077 | 0.0047 | 0.0030 |
| 37 | 0.0077 | 0.0047 | 0.0030 |
| 38 | 0.0077 | 0.0047 | 0.0030 |
| 39 | 0.0078 | 0.0048 | 0.0030 |
| 40 | 0.0078 | 0.0048 | 0.0030 |
| 41 | 0.0078 | 0.0048 | 0.0030 |
| 42 | 0.0078 | 0.0048 | 0.0030 |
| 43 | 0.0079 | 0.0048 | 0.0030 |
| 44 | 0.0079 | 0.0049 | 0.0030 |
| 45 | 0.0079 | 0.0049 | 0.0031 |
| 46 | 0.0080 | 0.0049 | 0.0031 |
| 47 | 0.0080 | 0.0049 | 0.0031 |
| 48 | 0.0080 | 0.0049 | 0.0031 |
| 49 | 0.0081 | 0.0050 | 0.0031 |
| 50 | 0.0081 | 0.0050 | 0.0031 |
| 51 | 0.0081 | 0.0050 | 0.0031 |
| 52 | 0.0081 | 0.0050 | 0.0031 |
| 53 | 0.0082 | 0.0050 | 0.0032 |
| 54 | 0.0082 | 0.0050 | 0.0032 |
| 55 | 0.0083 | 0.0051 | 0.0032 |
| 56 | 0.0083 | 0.0051 | 0.0032 |
| 57 | 0.0083 | 0.0051 | 0.0032 |
| 58 | 0.0083 | 0.0051 | 0.0032 |
| 59 | 0.0084 | 0.0052 | 0.0032 |
| 60 | 0.0084 | 0.0052 | 0.0032 |
| 61 | 0.0085 | 0.0052 | 0.0033 |
| 62 | 0.0085 | 0.0052 | 0.0033 |
| 63 | 0.0085 | 0.0052 | 0.0033 |
| 64 | 0.0086 | 0.0053 | 0.0033 |
| 65 | 0.0086 | 0.0053 | 0.0033 |
| 66 | 0.0086 | 0.0053 | 0.0033 |
| 67 | 0.0087 | 0.0053 | 0.0033 |
| 68 | 0.0087 | 0.0054 | 0.0034 |
| 69 | 0.0088 | 0.0054 | 0.0034 |
| 70 | 0.0088 | 0.0054 | 0.0034 |

| | | | |
|---|---|---|---|
| 71 | 0.0088 | 0.0054 | 0.0034 |
| 72 | 0.0089 | 0.0055 | 0.0034 |
| 73 | 0.0089 | 0.0055 | 0.0034 |
| 74 | 0.0090 | 0.0055 | 0.0035 |
| 75 | 0.0090 | 0.0055 | 0.0035 |
| 76 | 0.0090 | 0.0056 | 0.0035 |
| 77 | 0.0091 | 0.0056 | 0.0035 |
| 78 | 0.0091 | 0.0056 | 0.0035 |
| 79 | 0.0092 | 0.0057 | 0.0035 |
| 80 | 0.0092 | 0.0057 | 0.0036 |
| 81 | 0.0093 | 0.0057 | 0.0036 |
| 82 | 0.0093 | 0.0057 | 0.0036 |
| 83 | 0.0094 | 0.0058 | 0.0036 |
| 84 | 0.0094 | 0.0058 | 0.0036 |
| 85 | 0.0095 | 0.0058 | 0.0037 |
| 86 | 0.0095 | 0.0058 | 0.0037 |
| 87 | 0.0096 | 0.0059 | 0.0037 |
| 88 | 0.0096 | 0.0059 | 0.0037 |
| 89 | 0.0097 | 0.0060 | 0.0037 |
| 90 | 0.0097 | 0.0060 | 0.0037 |
| 91 | 0.0098 | 0.0060 | 0.0038 |
| 92 | 0.0098 | 0.0060 | 0.0038 |
| 93 | 0.0099 | 0.0061 | 0.0038 |
| 94 | 0.0099 | 0.0061 | 0.0038 |
| 95 | 0.0100 | 0.0062 | 0.0039 |
| 96 | 0.0101 | 0.0062 | 0.0039 |
| 97 | 0.0101 | 0.0062 | 0.0039 |
| 98 | 0.0102 | 0.0063 | 0.0039 |
| 99 | 0.0103 | 0.0063 | 0.0040 |
| 100 | 0.0103 | 0.0063 | 0.0040 |
| 101 | 0.0104 | 0.0064 | 0.0040 |
| 102 | 0.0104 | 0.0064 | 0.0040 |
| 103 | 0.0105 | 0.0065 | 0.0040 |
| 104 | 0.0106 | 0.0065 | 0.0041 |
| 105 | 0.0106 | 0.0065 | 0.0041 |
| 106 | 0.0107 | 0.0066 | 0.0041 |
| 107 | 0.0108 | 0.0066 | 0.0042 |
| 108 | 0.0108 | 0.0067 | 0.0042 |
| 109 | 0.0109 | 0.0067 | 0.0042 |
| 110 | 0.0110 | 0.0067 | 0.0042 |
| 111 | 0.0111 | 0.0068 | 0.0043 |
| 112 | 0.0111 | 0.0068 | 0.0043 |
| 113 | 0.0112 | 0.0069 | 0.0043 |
| 114 | 0.0113 | 0.0069 | 0.0043 |
| 115 | 0.0114 | 0.0070 | 0.0044 |
| 116 | 0.0115 | 0.0070 | 0.0044 |
| 117 | 0.0116 | 0.0071 | 0.0045 |
| 118 | 0.0116 | 0.0071 | 0.0045 |
| 119 | 0.0117 | 0.0072 | 0.0045 |
| 120 | 0.0118 | 0.0073 | 0.0045 |
| 121 | 0.0119 | 0.0073 | 0.0046 |
| 122 | 0.0120 | 0.0074 | 0.0046 |
| 123 | 0.0121 | 0.0075 | 0.0047 |
| 124 | 0.0122 | 0.0075 | 0.0047 |
| 125 | 0.0123 | 0.0076 | 0.0047 |
| 126 | 0.0124 | 0.0076 | 0.0048 |
| 127 | 0.0125 | 0.0077 | 0.0048 |
| 128 | 0.0126 | 0.0077 | 0.0049 |
| 129 | 0.0128 | 0.0078 | 0.0049 |
| 130 | 0.0128 | 0.0079 | 0.0049 |
| 131 | 0.0130 | 0.0080 | 0.0050 |
| 132 | 0.0131 | 0.0080 | 0.0050 |
| 133 | 0.0132 | 0.0081 | 0.0051 |
| 134 | 0.0133 | 0.0082 | 0.0051 |
| 135 | 0.0135 | 0.0083 | 0.0052 |
| 136 | 0.0136 | 0.0083 | 0.0052 |
| 137 | 0.0138 | 0.0085 | 0.0053 |
| 138 | 0.0138 | 0.0085 | 0.0053 |
| 139 | 0.0140 | 0.0086 | 0.0054 |
| 140 | 0.0141 | 0.0087 | 0.0054 |
| 141 | 0.0143 | 0.0088 | 0.0055 |

| | | | |
|---|---|---|---|
| 142 | 0.0145 | 0.0089 | 0.0056 |
| 143 | 0.0147 | 0.0090 | 0.0057 |
| 144 | 0.0148 | 0.0091 | 0.0057 |
| 145 | 0.0174 | 0.0107 | 0.0067 |
| 146 | 0.0176 | 0.0108 | 0.0068 |
| 147 | 0.0178 | 0.0109 | 0.0069 |
| 148 | 0.0179 | 0.0110 | 0.0069 |
| 149 | 0.0182 | 0.0112 | 0.0070 |
| 150 | 0.0183 | 0.0113 | 0.0071 |
| 151 | 0.0186 | 0.0115 | 0.0072 |
| 152 | 0.0188 | 0.0115 | 0.0072 |
| 153 | 0.0191 | 0.0117 | 0.0074 |
| 154 | 0.0192 | 0.0118 | 0.0074 |
| 155 | 0.0196 | 0.0120 | 0.0075 |
| 156 | 0.0198 | 0.0121 | 0.0076 |
| 157 | 0.0201 | 0.0124 | 0.0077 |
| 158 | 0.0203 | 0.0125 | 0.0078 |
| 159 | 0.0207 | 0.0127 | 0.0080 |
| 160 | 0.0209 | 0.0128 | 0.0081 |
| 161 | 0.0213 | 0.0131 | 0.0082 |
| 162 | 0.0216 | 0.0133 | 0.0083 |
| 163 | 0.0220 | 0.0135 | 0.0085 |
| 164 | 0.0223 | 0.0137 | 0.0086 |
| 165 | 0.0228 | 0.0140 | 0.0088 |
| 166 | 0.0231 | 0.0142 | 0.0089 |
| 167 | 0.0237 | 0.0145 | 0.0091 |
| 168 | 0.0240 | 0.0147 | 0.0092 |
| 169 | 0.0246 | 0.0151 | 0.0095 |
| 170 | 0.0250 | 0.0154 | 0.0096 |
| 171 | 0.0257 | 0.0158 | 0.0099 |
| 172 | 0.0261 | 0.0161 | 0.0101 |
| 173 | 0.0270 | 0.0166 | 0.0104 |
| 174 | 0.0275 | 0.0169 | 0.0106 |
| 175 | 0.0285 | 0.0175 | 0.0110 |
| 176 | 0.0290 | 0.0178 | 0.0112 |
| 177 | 0.0302 | 0.0186 | 0.0116 |
| 178 | 0.0309 | 0.0190 | 0.0119 |
| 179 | 0.0323 | 0.0199 | 0.0124 |
| 180 | 0.0331 | 0.0204 | 0.0128 |
| 181 | 0.0349 | 0.0215 | 0.0135 |
| 182 | 0.0360 | 0.0221 | 0.0139 |
| 183 | 0.0383 | 0.0236 | 0.0148 |
| 184 | 0.0397 | 0.0244 | 0.0153 |
| 185 | 0.0341 | 0.0210 | 0.0131 |
| 186 | 0.0360 | 0.0221 | 0.0139 |
| 187 | 0.0409 | 0.0251 | 0.0157 |
| 188 | 0.0441 | 0.0271 | 0.0170 |
| 189 | 0.0531 | 0.0327 | 0.0205 |
| 190 | 0.0600 | 0.0369 | 0.0231 |
| 191 | 0.0857 | 0.0484 | 0.0373 |
| 192 | 0.1179 | 0.0484 | 0.0695 |
| 193 | 0.3689 | 0.0484 | 0.3205 |
| 194 | 0.0698 | 0.0429 | 0.0269 |
| 195 | 0.0480 | 0.0295 | 0.0185 |
| 196 | 0.0382 | 0.0235 | 0.0147 |
| 197 | 0.0412 | 0.0254 | 0.0159 |
| 198 | 0.0371 | 0.0228 | 0.0143 |
| 199 | 0.0340 | 0.0209 | 0.0131 |
| 200 | 0.0316 | 0.0194 | 0.0122 |
| 201 | 0.0296 | 0.0182 | 0.0114 |
| 202 | 0.0279 | 0.0172 | 0.0108 |
| 203 | 0.0266 | 0.0163 | 0.0102 |
| 204 | 0.0254 | 0.0156 | 0.0098 |
| 205 | 0.0243 | 0.0149 | 0.0094 |
| 206 | 0.0234 | 0.0144 | 0.0090 |
| 207 | 0.0225 | 0.0139 | 0.0087 |
| 208 | 0.0218 | 0.0134 | 0.0084 |
| 209 | 0.0211 | 0.0130 | 0.0081 |
| 210 | 0.0205 | 0.0126 | 0.0079 |
| 211 | 0.0199 | 0.0123 | 0.0077 |
| 212 | 0.0194 | 0.0119 | 0.0075 |

| | | | |
|---|---|---|---|
| 213 | 0.0189 | 0.0116 | 0.0073 |
| 214 | 0.0185 | 0.0114 | 0.0071 |
| 215 | 0.0181 | 0.0111 | 0.0070 |
| 216 | 0.0177 | 0.0109 | 0.0068 |
| 217 | 0.0149 | 0.0092 | 0.0057 |
| 218 | 0.0146 | 0.0090 | 0.0056 |
| 219 | 0.0142 | 0.0088 | 0.0055 |
| 220 | 0.0139 | 0.0086 | 0.0054 |
| 221 | 0.0137 | 0.0084 | 0.0053 |
| 222 | 0.0134 | 0.0082 | 0.0052 |
| 223 | 0.0131 | 0.0081 | 0.0051 |
| 224 | 0.0129 | 0.0079 | 0.0050 |
| 225 | 0.0127 | 0.0078 | 0.0049 |
| 226 | 0.0125 | 0.0077 | 0.0048 |
| 227 | 0.0123 | 0.0075 | 0.0047 |
| 228 | 0.0121 | 0.0074 | 0.0046 |
| 229 | 0.0119 | 0.0073 | 0.0046 |
| 230 | 0.0117 | 0.0072 | 0.0045 |
| 231 | 0.0115 | 0.0071 | 0.0044 |
| 232 | 0.0113 | 0.0070 | 0.0044 |
| 233 | 0.0112 | 0.0069 | 0.0043 |
| 234 | 0.0110 | 0.0068 | 0.0042 |
| 235 | 0.0109 | 0.0067 | 0.0042 |
| 236 | 0.0107 | 0.0066 | 0.0041 |
| 237 | 0.0106 | 0.0065 | 0.0041 |
| 238 | 0.0105 | 0.0064 | 0.0040 |
| 239 | 0.0103 | 0.0064 | 0.0040 |
| 240 | 0.0102 | 0.0063 | 0.0039 |
| 241 | 0.0101 | 0.0062 | 0.0039 |
| 242 | 0.0100 | 0.0061 | 0.0038 |
| 243 | 0.0099 | 0.0061 | 0.0038 |
| 244 | 0.0098 | 0.0060 | 0.0038 |
| 245 | 0.0097 | 0.0059 | 0.0037 |
| 246 | 0.0095 | 0.0059 | 0.0037 |
| 247 | 0.0094 | 0.0058 | 0.0036 |
| 248 | 0.0094 | 0.0057 | 0.0036 |
| 249 | 0.0093 | 0.0057 | 0.0036 |
| 250 | 0.0092 | 0.0056 | 0.0035 |
| 251 | 0.0091 | 0.0056 | 0.0035 |
| 252 | 0.0090 | 0.0055 | 0.0035 |
| 253 | 0.0089 | 0.0055 | 0.0034 |
| 254 | 0.0088 | 0.0054 | 0.0034 |
| 255 | 0.0087 | 0.0054 | 0.0034 |
| 256 | 0.0087 | 0.0053 | 0.0033 |
| 257 | 0.0086 | 0.0053 | 0.0033 |
| 258 | 0.0085 | 0.0052 | 0.0033 |
| 259 | 0.0084 | 0.0052 | 0.0033 |
| 260 | 0.0084 | 0.0051 | 0.0032 |
| 261 | 0.0083 | 0.0051 | 0.0032 |
| 262 | 0.0082 | 0.0051 | 0.0032 |
| 263 | 0.0082 | 0.0050 | 0.0031 |
| 264 | 0.0081 | 0.0050 | 0.0031 |
| 265 | 0.0080 | 0.0049 | 0.0031 |
| 266 | 0.0080 | 0.0049 | 0.0031 |
| 267 | 0.0079 | 0.0049 | 0.0030 |
| 268 | 0.0079 | 0.0048 | 0.0030 |
| 269 | 0.0078 | 0.0048 | 0.0030 |
| 270 | 0.0077 | 0.0048 | 0.0030 |
| 271 | 0.0077 | 0.0047 | 0.0030 |
| 272 | 0.0076 | 0.0047 | 0.0029 |
| 273 | 0.0076 | 0.0047 | 0.0029 |
| 274 | 0.0075 | 0.0046 | 0.0029 |
| 275 | 0.0075 | 0.0046 | 0.0029 |
| 276 | 0.0074 | 0.0046 | 0.0029 |
| 277 | 0.0074 | 0.0045 | 0.0028 |
| 278 | 0.0073 | 0.0045 | 0.0028 |
| 279 | 0.0073 | 0.0045 | 0.0028 |
| 280 | 0.0072 | 0.0044 | 0.0028 |
| 281 | 0.0072 | 0.0044 | 0.0028 |
| 282 | 0.0071 | 0.0044 | 0.0027 |
| 283 | 0.0071 | 0.0044 | 0.0027 |

| | | | |
|---|---|---|---|
| 284 | 0.0070 | 0.0043 | 0.0027 |
| 285 | 0.0070 | 0.0043 | 0.0027 |
| 286 | 0.0070 | 0.0043 | 0.0027 |
| 287 | 0.0069 | 0.0043 | 0.0027 |
| 288 | 0.0069 | 0.0042 | 0.0026 |

Total soil rain loss = 2.57(In)
Total effective rainfall = 1.95(In)
Peak flow rate in flood hydrograph = 10.80(CFS)

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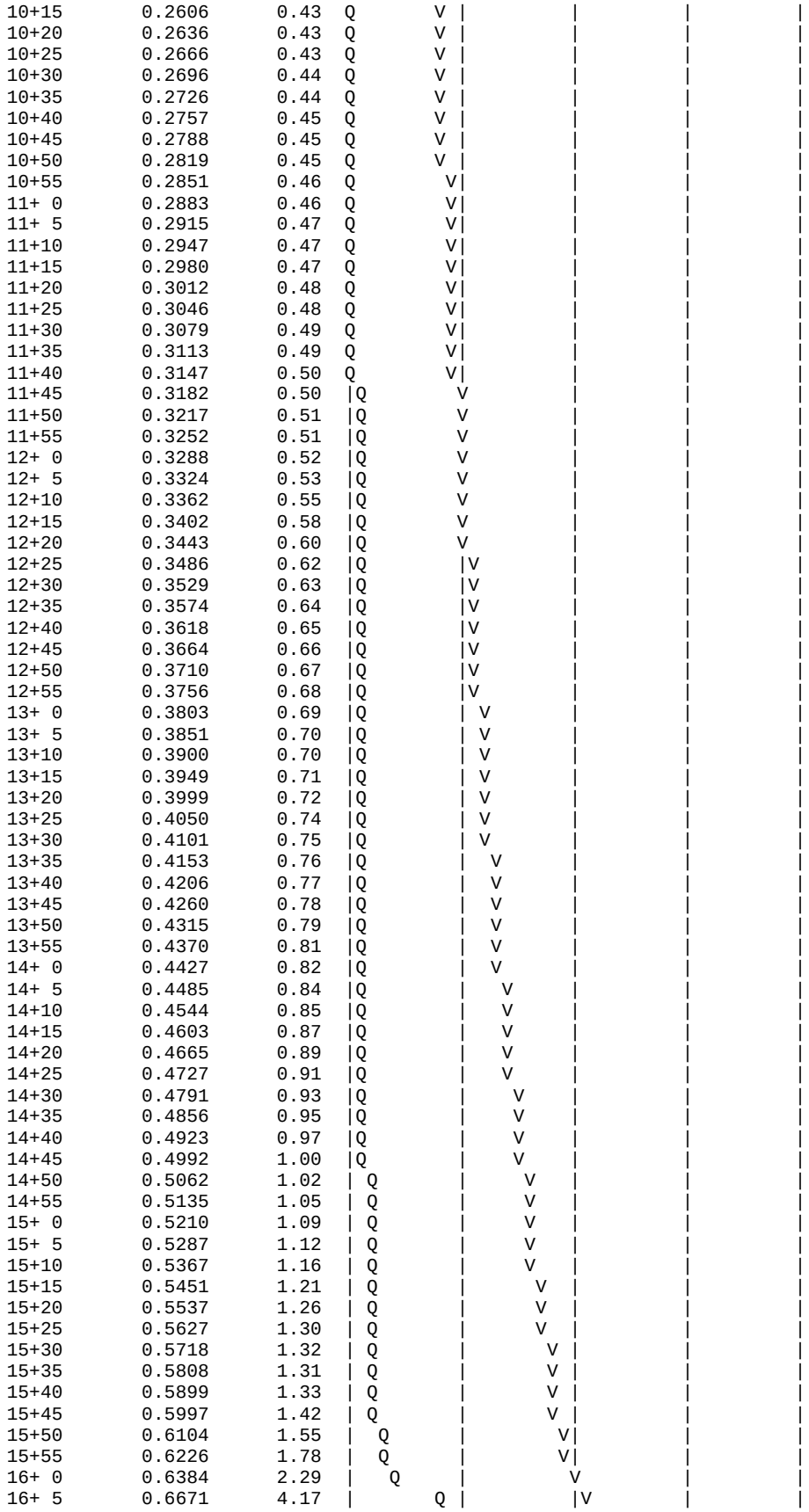
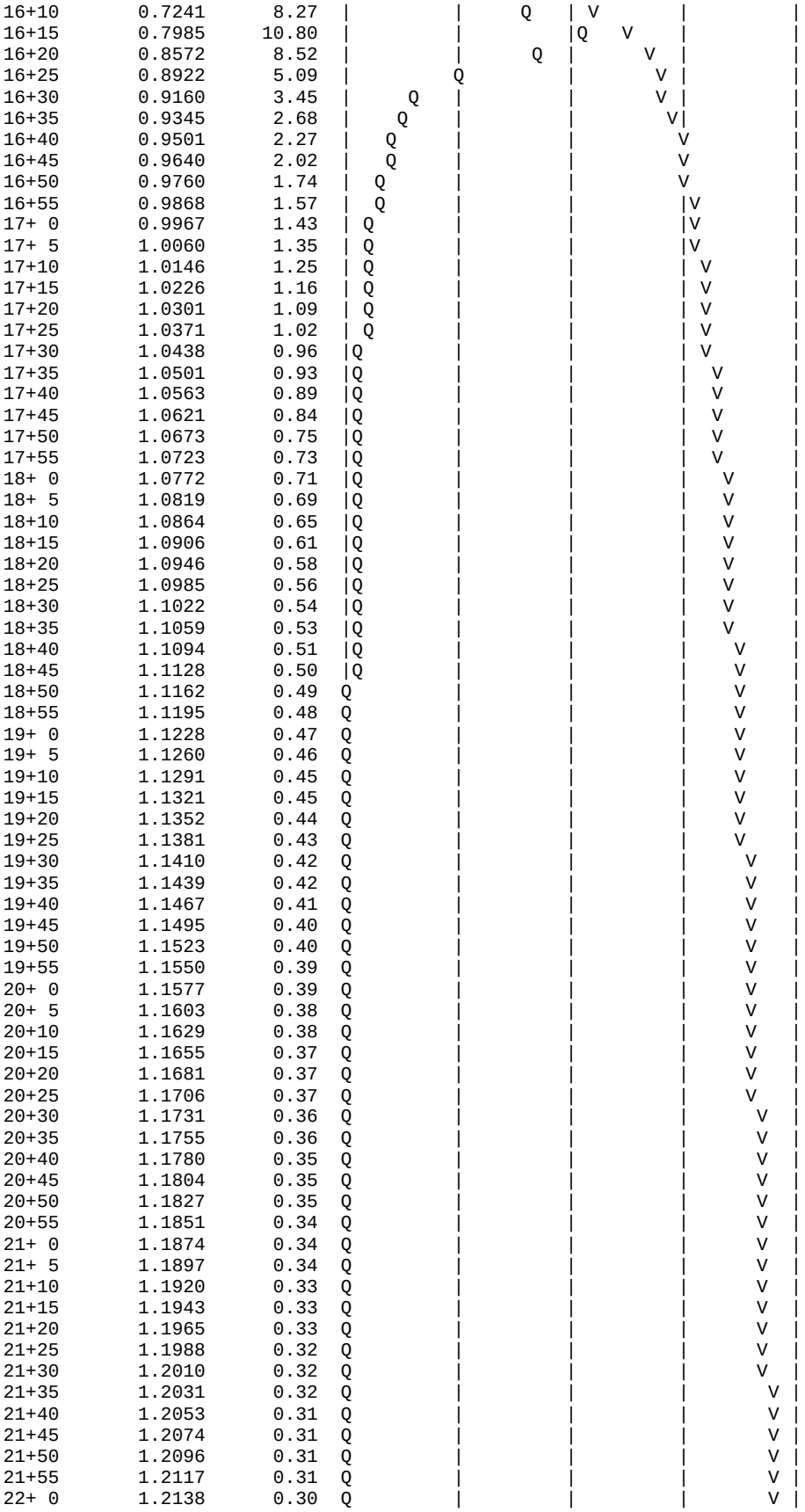
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0001 | 0.01 | Q | | | | |
| 0+10 | 0.0004 | 0.05 | Q | | | | |
| 0+15 | 0.0012 | 0.12 | Q | | | | |
| 0+20 | 0.0024 | 0.17 | Q | | | | |
| 0+25 | 0.0038 | 0.20 | Q | | | | |
| 0+30 | 0.0053 | 0.21 | Q | | | | |
| 0+35 | 0.0068 | 0.22 | Q | | | | |
| 0+40 | 0.0084 | 0.23 | Q | | | | |
| 0+45 | 0.0100 | 0.23 | Q | | | | |
| 0+50 | 0.0116 | 0.24 | Q | | | | |
| 0+55 | 0.0133 | 0.24 | Q | | | | |
| 1+ 0 | 0.0150 | 0.24 | Q | | | | |
| 1+ 5 | 0.0167 | 0.25 | Q | | | | |
| 1+10 | 0.0184 | 0.25 | Q | | | | |
| 1+15 | 0.0201 | 0.25 | Q | | | | |
| 1+20 | 0.0219 | 0.25 | Q | | | | |
| 1+25 | 0.0236 | 0.26 | Q | | | | |
| 1+30 | 0.0254 | 0.26 | Q | | | | |
| 1+35 | 0.0272 | 0.26 | Q | | | | |
| 1+40 | 0.0290 | 0.26 | Q | | | | |
| 1+45 | 0.0308 | 0.26 | Q | | | | |
| 1+50 | 0.0326 | 0.26 | QV | | | | |
| 1+55 | 0.0344 | 0.26 | QV | | | | |
| 2+ 0 | 0.0362 | 0.26 | QV | | | | |
| 2+ 5 | 0.0381 | 0.27 | QV | | | | |
| 2+10 | 0.0399 | 0.27 | QV | | | | |
| 2+15 | 0.0417 | 0.27 | QV | | | | |
| 2+20 | 0.0436 | 0.27 | QV | | | | |
| 2+25 | 0.0454 | 0.27 | QV | | | | |
| 2+30 | 0.0473 | 0.27 | QV | | | | |
| 2+35 | 0.0491 | 0.27 | QV | | | | |
| 2+40 | 0.0510 | 0.27 | QV | | | | |
| 2+45 | 0.0529 | 0.27 | QV | | | | |
| 2+50 | 0.0548 | 0.27 | QV | | | | |
| 2+55 | 0.0567 | 0.27 | QV | | | | |
| 3+ 0 | 0.0586 | 0.28 | QV | | | | |
| 3+ 5 | 0.0605 | 0.28 | QV | | | | |
| 3+10 | 0.0624 | 0.28 | QV | | | | |
| 3+15 | 0.0643 | 0.28 | Q V | | | | |
| 3+20 | 0.0662 | 0.28 | Q V | | | | |
| 3+25 | 0.0681 | 0.28 | Q V | | | | |
| 3+30 | 0.0701 | 0.28 | Q V | | | | |
| 3+35 | 0.0720 | 0.28 | Q V | | | | |
| 3+40 | 0.0740 | 0.28 | Q V | | | | |
| 3+45 | 0.0759 | 0.28 | Q V | | | | |
| 3+50 | 0.0779 | 0.29 | Q V | | | | |
| 3+55 | 0.0799 | 0.29 | Q V | | | | |
| 4+ 0 | 0.0819 | 0.29 | Q V | | | | |
| 4+ 5 | 0.0838 | 0.29 | Q V | | | | |
| 4+10 | 0.0858 | 0.29 | Q V | | | | |
| 4+15 | 0.0878 | 0.29 | Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4+20 | 0.0899 | 0.29 | Q V | \| | \| | \| | \| |
| 4+25 | 0.0919 | 0.29 | Q V | \| | \| | \| | \| |
| 4+30 | 0.0939 | 0.29 | Q V | \| | \| | \| | \| |
| 4+35 | 0.0959 | 0.30 | Q V | \| | \| | \| | \| |
| 4+40 | 0.0980 | 0.30 | Q V | \| | \| | \| | \| |
| 4+45 | 0.1000 | 0.30 | Q V | \| | \| | \| | \| |
| 4+50 | 0.1021 | 0.30 | Q V | \| | \| | \| | \| |
| 4+55 | 0.1042 | 0.30 | Q V | \| | \| | \| | \| |
| 5+ 0 | 0.1062 | 0.30 | Q V | \| | \| | \| | \| |
| 5+ 5 | 0.1083 | 0.30 | Q V | \| | \| | \| | \| |
| 5+10 | 0.1104 | 0.30 | Q V | \| | \| | \| | \| |
| 5+15 | 0.1125 | 0.31 | Q V | \| | \| | \| | \| |
| 5+20 | 0.1146 | 0.31 | Q V | \| | \| | \| | \| |
| 5+25 | 0.1168 | 0.31 | Q V | \| | \| | \| | \| |
| 5+30 | 0.1189 | 0.31 | Q V | \| | \| | \| | \| |
| 5+35 | 0.1210 | 0.31 | Q V | \| | \| | \| | \| |
| 5+40 | 0.1232 | 0.31 | Q V | \| | \| | \| | \| |
| 5+45 | 0.1253 | 0.31 | Q V | \| | \| | \| | \| |
| 5+50 | 0.1275 | 0.31 | Q V | \| | \| | \| | \| |
| 5+55 | 0.1297 | 0.32 | Q V | \| | \| | \| | \| |
| 6+ 0 | 0.1319 | 0.32 | Q V | \| | \| | \| | \| |
| 6+ 5 | 0.1341 | 0.32 | Q V | \| | \| | \| | \| |
| 6+10 | 0.1363 | 0.32 | Q V | \| | \| | \| | \| |
| 6+15 | 0.1385 | 0.32 | Q V | \| | \| | \| | \| |
| 6+20 | 0.1407 | 0.32 | Q V | \| | \| | \| | \| |
| 6+25 | 0.1430 | 0.33 | Q V | \| | \| | \| | \| |
| 6+30 | 0.1452 | 0.33 | Q V | \| | \| | \| | \| |
| 6+35 | 0.1475 | 0.33 | Q V | \| | \| | \| | \| |
| 6+40 | 0.1498 | 0.33 | Q V | \| | \| | \| | \| |
| 6+45 | 0.1520 | 0.33 | Q V | \| | \| | \| | \| |
| 6+50 | 0.1543 | 0.33 | Q V | \| | \| | \| | \| |
| 6+55 | 0.1566 | 0.33 | Q V | \| | \| | \| | \| |
| 7+ 0 | 0.1590 | 0.34 | Q V | \| | \| | \| | \| |
| 7+ 5 | 0.1613 | 0.34 | Q V | \| | \| | \| | \| |
| 7+10 | 0.1636 | 0.34 | Q V | \| | \| | \| | \| |
| 7+15 | 0.1660 | 0.34 | Q V | \| | \| | \| | \| |
| 7+20 | 0.1683 | 0.34 | Q V | \| | \| | \| | \| |
| 7+25 | 0.1707 | 0.35 | Q V | \| | \| | \| | \| |
| 7+30 | 0.1731 | 0.35 | Q V | \| | \| | \| | \| |
| 7+35 | 0.1755 | 0.35 | Q V | \| | \| | \| | \| |
| 7+40 | 0.1779 | 0.35 | Q V | \| | \| | \| | \| |
| 7+45 | 0.1804 | 0.35 | Q V | \| | \| | \| | \| |
| 7+50 | 0.1828 | 0.35 | Q V | \| | \| | \| | \| |
| 7+55 | 0.1853 | 0.36 | Q V | \| | \| | \| | \| |
| 8+ 0 | 0.1877 | 0.36 | Q V | \| | \| | \| | \| |
| 8+ 5 | 0.1902 | 0.36 | Q V | \| | \| | \| | \| |
| 8+10 | 0.1927 | 0.36 | Q V | \| | \| | \| | \| |
| 8+15 | 0.1952 | 0.36 | Q V | \| | \| | \| | \| |
| 8+20 | 0.1978 | 0.37 | Q V | \| | \| | \| | \| |
| 8+25 | 0.2003 | 0.37 | Q V | \| | \| | \| | \| |
| 8+30 | 0.2029 | 0.37 | Q V | \| | \| | \| | \| |
| 8+35 | 0.2054 | 0.37 | Q V | \| | \| | \| | \| |
| 8+40 | 0.2080 | 0.38 | Q V | \| | \| | \| | \| |
| 8+45 | 0.2106 | 0.38 | Q V | \| | \| | \| | \| |
| 8+50 | 0.2132 | 0.38 | Q V | \| | \| | \| | \| |
| 8+55 | 0.2159 | 0.38 | Q V | \| | \| | \| | \| |
| 9+ 0 | 0.2185 | 0.39 | Q V | \| | \| | \| | \| |
| 9+ 5 | 0.2212 | 0.39 | Q V | \| | \| | \| | \| |
| 9+10 | 0.2239 | 0.39 | Q V | \| | \| | \| | \| |
| 9+15 | 0.2266 | 0.39 | Q V | \| | \| | \| | \| |
| 9+20 | 0.2293 | 0.40 | Q V | \| | \| | \| | \| |
| 9+25 | 0.2321 | 0.40 | Q V | \| | \| | \| | \| |
| 9+30 | 0.2348 | 0.40 | Q V | \| | \| | \| | \| |
| 9+35 | 0.2376 | 0.40 | Q V | \| | \| | \| | \| |
| 9+40 | 0.2404 | 0.41 | Q V | \| | \| | \| | \| |
| 9+45 | 0.2432 | 0.41 | Q V | \| | \| | \| | \| |
| 9+50 | 0.2461 | 0.41 | Q V | \| | \| | \| | \| |
| 9+55 | 0.2489 | 0.42 | Q V | \| | \| | \| | \| |
| 10+ 0 | 0.2518 | 0.42 | Q V | \| | \| | \| | \| |
| 10+ 5 | 0.2547 | 0.42 | Q V | \| | \| | \| | \| |
| 10+10 | 0.2577 | 0.42 | Q V | \| | \| | \| | \| |





| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 22+ 5 | 1.2158 | 0.30 | Q | \| | \| | \| | V \| |
| 22+10 | 1.2179 | 0.30 | Q | \| | \| | \| | V \| |
| 22+15 | 1.2199 | 0.30 | Q | \| | \| | \| | V \| |
| 22+20 | 1.2219 | 0.29 | Q | \| | \| | \| | V \| |
| 22+25 | 1.2239 | 0.29 | Q | \| | \| | \| | V \| |
| 22+30 | 1.2259 | 0.29 | Q | \| | \| | \| | V \| |
| 22+35 | 1.2279 | 0.29 | Q | \| | \| | \| | V \| |
| 22+40 | 1.2299 | 0.28 | Q | \| | \| | \| | V \| |
| 22+45 | 1.2318 | 0.28 | Q | \| | \| | \| | V \| |
| 22+50 | 1.2337 | 0.28 | Q | \| | \| | \| | V \| |
| 22+55 | 1.2357 | 0.28 | Q | \| | \| | \| | V\| |
| 23+ 0 | 1.2376 | 0.28 | Q | \| | \| | \| | V\| |
| 23+ 5 | 1.2395 | 0.27 | Q | \| | \| | \| | V\| |
| 23+10 | 1.2413 | 0.27 | Q | \| | \| | \| | V\| |
| 23+15 | 1.2432 | 0.27 | Q | \| | \| | \| | V\| |
| 23+20 | 1.2450 | 0.27 | Q | \| | \| | \| | V\| |
| 23+25 | 1.2469 | 0.27 | Q | \| | \| | \| | V\| |
| 23+30 | 1.2487 | 0.27 | Q | \| | \| | \| | V\| |
| 23+35 | 1.2505 | 0.26 | Q | \| | \| | \| | V\| |
| 23+40 | 1.2523 | 0.26 | Q | \| | \| | \| | V\| |
| 23+45 | 1.2541 | 0.26 | Q | \| | \| | \| | V\| |
| 23+50 | 1.2559 | 0.26 | Q | \| | \| | \| | V\| |
| 23+55 | 1.2577 | 0.26 | Q | \| | \| | \| | V\| |
| 24+ 0 | 1.2594 | 0.26 | Q | \| | \| | \| | V\| |
| 24+ 5 | 1.2611 | 0.24 | Q | \| | \| | \| | V\| |
| 24+10 | 1.2625 | 0.20 | Q | \| | \| | \| | V\| |
| 24+15 | 1.2634 | 0.13 | Q | \| | \| | \| | V\| |
| 24+20 | 1.2639 | 0.08 | Q | \| | \| | \| | V\| |
| 24+25 | 1.2643 | 0.05 | Q | \| | \| | \| | V\| |
| 24+30 | 1.2646 | 0.04 | Q | \| | \| | \| | V\| |
| 24+35 | 1.2648 | 0.03 | Q | \| | \| | \| | V\| |
| 24+40 | 1.2649 | 0.02 | Q | \| | \| | \| | V\| |
| 24+45 | 1.2651 | 0.02 | Q | \| | \| | \| | V\| |
| 24+50 | 1.2652 | 0.02 | Q | \| | \| | \| | V\| |
| 24+55 | 1.2653 | 0.01 | Q | \| | \| | \| | V\| |
| 25+ 0 | 1.2653 | 0.01 | Q | \| | \| | \| | V\| |
| 25+ 5 | 1.2654 | 0.01 | Q | \| | \| | \| | V\| |
| 25+10 | 1.2654 | 0.01 | Q | \| | \| | \| | V\| |
| 25+15 | 1.2655 | 0.00 | Q | \| | \| | \| | V\| |
| 25+20 | 1.2655 | 0.00 | Q | \| | \| | \| | V\| |
| 25+25 | 1.2655 | 0.00 | Q | \| | \| | \| | V\| |
| 25+30 | 1.2655 | 0.00 | Q | \| | \| | \| | V\| |
| 25+35 | 1.2655 | 0.00 | Q | \| | \| | \| | V\| |
| 25+40 | 1.2655 | 0.00 | Q | \| | \| | \| | V\| |

# Unit Hydrograph Analysis: Developed Condition (25 yr, 24 hr Storm Event)

```
        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 - 2018, Version 9.0

                Study date  07/01/23

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


Program License Serial Number 6484

------------------------------------------------------------------------
UH ANALYSIS
DEVELOPED CONDITION
25-YR STORM EVENT

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

        Storm Event Year = 25

        Antecedent Moisture Condition = 3

 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        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 25
             7.80            1           1.00
------------------------------------------------------------------------
Rainfall data for year 25
             7.80            6           2.47
------------------------------------------------------------------------
Rainfall data for year 25
             7.80           24           4.52
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      52.0          7.80      1.000     0.785    0.100    0.079

Area-averaged adjusted loss rate Fm (In/Hr) =  0.079

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
     0.78   0.100         32.0      52.0       9.23     0.133
     7.02   0.900         98.0      98.0       0.20     0.948

Area-averaged catchment yield fraction, Y =  0.866
Area-averaged low loss fraction, Yb =  0.134
Direct entry of lag time by user
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Watershed area = 7.80(Ac.)
Catchment Lag time = 0.162 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 51.4403
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.134 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.369(In)
Computed peak 30-minute rainfall = 0.756(In)
Specified peak 1-hour rainfall = 0.997(In)
Computed peak 3-hour rainfall = 1.739(In)
Specified peak 6-hour rainfall = 2.470(In)
Specified peak 24-hour rainfall = 4.520(In)

Rainfall depth area reduction factors:
Using a total area of 7.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.369(In)
30-minute factor = 1.000 Adjusted rainfall = 0.755(In)
1-hour factor = 1.000 Adjusted rainfall = 0.997(In)
3-hour factor = 1.000 Adjusted rainfall = 1.739(In)
6-hour factor = 1.000 Adjusted rainfall = 2.470(In)
24-hour factor = 1.000 Adjusted rainfall = 4.520(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 = 94.33 (CFS)) | |
| 1 | 4.833 | 4.559 |
| 2 | 31.441 | 25.099 |
| 3 | 71.022 | 37.337 |
| 4 | 91.060 | 18.902 |
| 5 | 97.413 | 5.993 |
| 6 | 98.893 | 1.396 |
| 7 | 100.000 | 1.045 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3689 | 0.3689 |
| 2 | 0.4867 | 0.1179 |
| 3 | 0.5724 | 0.0857 |
| 4 | 0.6422 | 0.0698 |
| 5 | 0.7022 | 0.0600 |
| 6 | 0.7553 | 0.0531 |
| 7 | 0.8033 | 0.0480 |
| 8 | 0.8474 | 0.0441 |
| 9 | 0.8883 | 0.0409 |
| 10 | 0.9265 | 0.0382 |
| 11 | 0.9625 | 0.0360 |
| 12 | 0.9966 | 0.0341 |
| 13 | 1.0379 | 0.0412 |
| 14 | 1.0776 | 0.0397 |
| 15 | 1.1159 | 0.0383 |
| 16 | 1.1530 | 0.0371 |
| 17 | 1.1890 | 0.0360 |
| 18 | 1.2239 | 0.0349 |
| 19 | 1.2579 | 0.0340 |
| 20 | 1.2910 | 0.0331 |
| 21 | 1.3233 | 0.0323 |
| 22 | 1.3549 | 0.0316 |
| 23 | 1.3857 | 0.0309 |
| 24 | 1.4159 | 0.0302 |
| 25 | 1.4455 | 0.0296 |
| 26 | 1.4745 | 0.0290 |
| 27 | 1.5030 | 0.0285 |

| | | |
|---|---|---|
| 28 | 1.5310 | 0.0279 |
| 29 | 1.5584 | 0.0275 |
| 30 | 1.5854 | 0.0270 |
| 31 | 1.6120 | 0.0266 |
| 32 | 1.6381 | 0.0261 |
| 33 | 1.6638 | 0.0257 |
| 34 | 1.6892 | 0.0254 |
| 35 | 1.7142 | 0.0250 |
| 36 | 1.7388 | 0.0246 |
| 37 | 1.7631 | 0.0243 |
| 38 | 1.7871 | 0.0240 |
| 39 | 1.8107 | 0.0237 |
| 40 | 1.8341 | 0.0234 |
| 41 | 1.8572 | 0.0231 |
| 42 | 1.8800 | 0.0228 |
| 43 | 1.9025 | 0.0225 |
| 44 | 1.9248 | 0.0223 |
| 45 | 1.9468 | 0.0220 |
| 46 | 1.9686 | 0.0218 |
| 47 | 1.9902 | 0.0216 |
| 48 | 2.0115 | 0.0213 |
| 49 | 2.0326 | 0.0211 |
| 50 | 2.0535 | 0.0209 |
| 51 | 2.0742 | 0.0207 |
| 52 | 2.0947 | 0.0205 |
| 53 | 2.1150 | 0.0203 |
| 54 | 2.1351 | 0.0201 |
| 55 | 2.1550 | 0.0199 |
| 56 | 2.1748 | 0.0198 |
| 57 | 2.1944 | 0.0196 |
| 58 | 2.2138 | 0.0194 |
| 59 | 2.2330 | 0.0192 |
| 60 | 2.2521 | 0.0191 |
| 61 | 2.2711 | 0.0189 |
| 62 | 2.2898 | 0.0188 |
| 63 | 2.3085 | 0.0186 |
| 64 | 2.3269 | 0.0185 |
| 65 | 2.3453 | 0.0183 |
| 66 | 2.3635 | 0.0182 |
| 67 | 2.3815 | 0.0181 |
| 68 | 2.3995 | 0.0179 |
| 69 | 2.4173 | 0.0178 |
| 70 | 2.4350 | 0.0177 |
| 71 | 2.4525 | 0.0176 |
| 72 | 2.4699 | 0.0174 |
| 73 | 2.4848 | 0.0149 |
| 74 | 2.4996 | 0.0148 |
| 75 | 2.5143 | 0.0147 |
| 76 | 2.5288 | 0.0146 |
| 77 | 2.5433 | 0.0145 |
| 78 | 2.5576 | 0.0143 |
| 79 | 2.5719 | 0.0142 |
| 80 | 2.5860 | 0.0141 |
| 81 | 2.6001 | 0.0140 |
| 82 | 2.6140 | 0.0139 |
| 83 | 2.6279 | 0.0138 |
| 84 | 2.6416 | 0.0138 |
| 85 | 2.6553 | 0.0137 |
| 86 | 2.6689 | 0.0136 |
| 87 | 2.6823 | 0.0135 |
| 88 | 2.6957 | 0.0134 |
| 89 | 2.7090 | 0.0133 |
| 90 | 2.7223 | 0.0132 |
| 91 | 2.7354 | 0.0131 |
| 92 | 2.7485 | 0.0131 |
| 93 | 2.7615 | 0.0130 |
| 94 | 2.7744 | 0.0129 |
| 95 | 2.7872 | 0.0128 |
| 96 | 2.7999 | 0.0128 |
| 97 | 2.8126 | 0.0127 |
| 98 | 2.8252 | 0.0126 |

| | | |
|---|---|---|
| 99 | 2.8378 | 0.0125 |
| 100 | 2.8502 | 0.0125 |
| 101 | 2.8626 | 0.0124 |
| 102 | 2.8749 | 0.0123 |
| 103 | 2.8872 | 0.0123 |
| 104 | 2.8994 | 0.0122 |
| 105 | 2.9115 | 0.0121 |
| 106 | 2.9235 | 0.0121 |
| 107 | 2.9355 | 0.0120 |
| 108 | 2.9475 | 0.0119 |
| 109 | 2.9593 | 0.0119 |
| 110 | 2.9711 | 0.0118 |
| 111 | 2.9829 | 0.0117 |
| 112 | 2.9946 | 0.0117 |
| 113 | 3.0062 | 0.0116 |
| 114 | 3.0177 | 0.0116 |
| 115 | 3.0293 | 0.0115 |
| 116 | 3.0407 | 0.0115 |
| 117 | 3.0521 | 0.0114 |
| 118 | 3.0635 | 0.0113 |
| 119 | 3.0747 | 0.0113 |
| 120 | 3.0860 | 0.0112 |
| 121 | 3.0972 | 0.0112 |
| 122 | 3.1083 | 0.0111 |
| 123 | 3.1194 | 0.0111 |
| 124 | 3.1304 | 0.0110 |
| 125 | 3.1414 | 0.0110 |
| 126 | 3.1523 | 0.0109 |
| 127 | 3.1632 | 0.0109 |
| 128 | 3.1740 | 0.0108 |
| 129 | 3.1848 | 0.0108 |
| 130 | 3.1956 | 0.0107 |
| 131 | 3.2063 | 0.0107 |
| 132 | 3.2169 | 0.0106 |
| 133 | 3.2275 | 0.0106 |
| 134 | 3.2381 | 0.0106 |
| 135 | 3.2486 | 0.0105 |
| 136 | 3.2590 | 0.0105 |
| 137 | 3.2695 | 0.0104 |
| 138 | 3.2798 | 0.0104 |
| 139 | 3.2902 | 0.0103 |
| 140 | 3.3005 | 0.0103 |
| 141 | 3.3107 | 0.0103 |
| 142 | 3.3210 | 0.0102 |
| 143 | 3.3311 | 0.0102 |
| 144 | 3.3413 | 0.0101 |
| 145 | 3.3514 | 0.0101 |
| 146 | 3.3614 | 0.0101 |
| 147 | 3.3714 | 0.0100 |
| 148 | 3.3814 | 0.0100 |
| 149 | 3.3913 | 0.0099 |
| 150 | 3.4012 | 0.0099 |
| 151 | 3.4111 | 0.0099 |
| 152 | 3.4209 | 0.0098 |
| 153 | 3.4307 | 0.0098 |
| 154 | 3.4405 | 0.0098 |
| 155 | 3.4502 | 0.0097 |
| 156 | 3.4599 | 0.0097 |
| 157 | 3.4696 | 0.0097 |
| 158 | 3.4792 | 0.0096 |
| 159 | 3.4887 | 0.0096 |
| 160 | 3.4983 | 0.0095 |
| 161 | 3.5078 | 0.0095 |
| 162 | 3.5173 | 0.0095 |
| 163 | 3.5267 | 0.0094 |
| 164 | 3.5362 | 0.0094 |
| 165 | 3.5455 | 0.0094 |
| 166 | 3.5549 | 0.0094 |
| 167 | 3.5642 | 0.0093 |
| 168 | 3.5735 | 0.0093 |
| 169 | 3.5828 | 0.0093 |

| | | |
|---|---|---|
| 170 | 3.5920 | 0.0092 |
| 171 | 3.6012 | 0.0092 |
| 172 | 3.6103 | 0.0092 |
| 173 | 3.6195 | 0.0091 |
| 174 | 3.6286 | 0.0091 |
| 175 | 3.6377 | 0.0091 |
| 176 | 3.6467 | 0.0090 |
| 177 | 3.6557 | 0.0090 |
| 178 | 3.6647 | 0.0090 |
| 179 | 3.6737 | 0.0090 |
| 180 | 3.6826 | 0.0089 |
| 181 | 3.6915 | 0.0089 |
| 182 | 3.7004 | 0.0089 |
| 183 | 3.7092 | 0.0088 |
| 184 | 3.7181 | 0.0088 |
| 185 | 3.7269 | 0.0088 |
| 186 | 3.7356 | 0.0088 |
| 187 | 3.7444 | 0.0087 |
| 188 | 3.7531 | 0.0087 |
| 189 | 3.7618 | 0.0087 |
| 190 | 3.7704 | 0.0087 |
| 191 | 3.7791 | 0.0086 |
| 192 | 3.7877 | 0.0086 |
| 193 | 3.7963 | 0.0086 |
| 194 | 3.8048 | 0.0086 |
| 195 | 3.8134 | 0.0085 |
| 196 | 3.8219 | 0.0085 |
| 197 | 3.8304 | 0.0085 |
| 198 | 3.8388 | 0.0085 |
| 199 | 3.8473 | 0.0084 |
| 200 | 3.8557 | 0.0084 |
| 201 | 3.8641 | 0.0084 |
| 202 | 3.8724 | 0.0084 |
| 203 | 3.8808 | 0.0083 |
| 204 | 3.8891 | 0.0083 |
| 205 | 3.8974 | 0.0083 |
| 206 | 3.9057 | 0.0083 |
| 207 | 3.9139 | 0.0083 |
| 208 | 3.9222 | 0.0082 |
| 209 | 3.9304 | 0.0082 |
| 210 | 3.9386 | 0.0082 |
| 211 | 3.9467 | 0.0082 |
| 212 | 3.9549 | 0.0081 |
| 213 | 3.9630 | 0.0081 |
| 214 | 3.9711 | 0.0081 |
| 215 | 3.9792 | 0.0081 |
| 216 | 3.9872 | 0.0081 |
| 217 | 3.9953 | 0.0080 |
| 218 | 4.0033 | 0.0080 |
| 219 | 4.0113 | 0.0080 |
| 220 | 4.0193 | 0.0080 |
| 221 | 4.0272 | 0.0080 |
| 222 | 4.0351 | 0.0079 |
| 223 | 4.0431 | 0.0079 |
| 224 | 4.0509 | 0.0079 |
| 225 | 4.0588 | 0.0079 |
| 226 | 4.0667 | 0.0079 |
| 227 | 4.0745 | 0.0078 |
| 228 | 4.0823 | 0.0078 |
| 229 | 4.0901 | 0.0078 |
| 230 | 4.0979 | 0.0078 |
| 231 | 4.1056 | 0.0078 |
| 232 | 4.1134 | 0.0077 |
| 233 | 4.1211 | 0.0077 |
| 234 | 4.1288 | 0.0077 |
| 235 | 4.1365 | 0.0077 |
| 236 | 4.1442 | 0.0077 |
| 237 | 4.1518 | 0.0076 |
| 238 | 4.1594 | 0.0076 |
| 239 | 4.1670 | 0.0076 |
| 240 | 4.1746 | 0.0076 |

| | | |
|---|---|---|
| 241 | 4.1822 | 0.0076 |
| 242 | 4.1898 | 0.0076 |
| 243 | 4.1973 | 0.0075 |
| 244 | 4.2048 | 0.0075 |
| 245 | 4.2123 | 0.0075 |
| 246 | 4.2198 | 0.0075 |
| 247 | 4.2273 | 0.0075 |
| 248 | 4.2347 | 0.0075 |
| 249 | 4.2422 | 0.0074 |
| 250 | 4.2496 | 0.0074 |
| 251 | 4.2570 | 0.0074 |
| 252 | 4.2644 | 0.0074 |
| 253 | 4.2717 | 0.0074 |
| 254 | 4.2791 | 0.0074 |
| 255 | 4.2864 | 0.0073 |
| 256 | 4.2937 | 0.0073 |
| 257 | 4.3010 | 0.0073 |
| 258 | 4.3083 | 0.0073 |
| 259 | 4.3156 | 0.0073 |
| 260 | 4.3229 | 0.0073 |
| 261 | 4.3301 | 0.0072 |
| 262 | 4.3373 | 0.0072 |
| 263 | 4.3445 | 0.0072 |
| 264 | 4.3517 | 0.0072 |
| 265 | 4.3589 | 0.0072 |
| 266 | 4.3661 | 0.0072 |
| 267 | 4.3732 | 0.0071 |
| 268 | 4.3803 | 0.0071 |
| 269 | 4.3875 | 0.0071 |
| 270 | 4.3946 | 0.0071 |
| 271 | 4.4017 | 0.0071 |
| 272 | 4.4087 | 0.0071 |
| 273 | 4.4158 | 0.0071 |
| 274 | 4.4228 | 0.0070 |
| 275 | 4.4299 | 0.0070 |
| 276 | 4.4369 | 0.0070 |
| 277 | 4.4439 | 0.0070 |
| 278 | 4.4509 | 0.0070 |
| 279 | 4.4578 | 0.0070 |
| 280 | 4.4648 | 0.0070 |
| 281 | 4.4717 | 0.0069 |
| 282 | 4.4787 | 0.0069 |
| 283 | 4.4856 | 0.0069 |
| 284 | 4.4925 | 0.0069 |
| 285 | 4.4994 | 0.0069 |
| 286 | 4.5062 | 0.0069 |
| 287 | 4.5131 | 0.0069 |
| 288 | 4.5200 | 0.0068 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0068 | 0.0009 | 0.0059 |
| 2 | 0.0069 | 0.0009 | 0.0059 |
| 3 | 0.0069 | 0.0009 | 0.0060 |
| 4 | 0.0069 | 0.0009 | 0.0060 |
| 5 | 0.0069 | 0.0009 | 0.0060 |
| 6 | 0.0069 | 0.0009 | 0.0060 |
| 7 | 0.0070 | 0.0009 | 0.0060 |
| 8 | 0.0070 | 0.0009 | 0.0061 |
| 9 | 0.0070 | 0.0009 | 0.0061 |
| 10 | 0.0070 | 0.0009 | 0.0061 |
| 11 | 0.0071 | 0.0009 | 0.0061 |
| 12 | 0.0071 | 0.0009 | 0.0061 |
| 13 | 0.0071 | 0.0009 | 0.0062 |
| 14 | 0.0071 | 0.0010 | 0.0062 |
| 15 | 0.0071 | 0.0010 | 0.0062 |
| 16 | 0.0072 | 0.0010 | 0.0062 |
| 17 | 0.0072 | 0.0010 | 0.0062 |
| 18 | 0.0072 | 0.0010 | 0.0062 |

| | | | |
|---|---|---|---|
| 19 | 0.0072 | 0.0010 | 0.0063 |
| 20 | 0.0073 | 0.0010 | 0.0063 |
| 21 | 0.0073 | 0.0010 | 0.0063 |
| 22 | 0.0073 | 0.0010 | 0.0063 |
| 23 | 0.0073 | 0.0010 | 0.0064 |
| 24 | 0.0074 | 0.0010 | 0.0064 |
| 25 | 0.0074 | 0.0010 | 0.0064 |
| 26 | 0.0074 | 0.0010 | 0.0064 |
| 27 | 0.0074 | 0.0010 | 0.0064 |
| 28 | 0.0075 | 0.0010 | 0.0065 |
| 29 | 0.0075 | 0.0010 | 0.0065 |
| 30 | 0.0075 | 0.0010 | 0.0065 |
| 31 | 0.0075 | 0.0010 | 0.0065 |
| 32 | 0.0076 | 0.0010 | 0.0065 |
| 33 | 0.0076 | 0.0010 | 0.0066 |
| 34 | 0.0076 | 0.0010 | 0.0066 |
| 35 | 0.0076 | 0.0010 | 0.0066 |
| 36 | 0.0077 | 0.0010 | 0.0066 |
| 37 | 0.0077 | 0.0010 | 0.0067 |
| 38 | 0.0077 | 0.0010 | 0.0067 |
| 39 | 0.0078 | 0.0010 | 0.0067 |
| 40 | 0.0078 | 0.0010 | 0.0067 |
| 41 | 0.0078 | 0.0010 | 0.0068 |
| 42 | 0.0078 | 0.0010 | 0.0068 |
| 43 | 0.0079 | 0.0011 | 0.0068 |
| 44 | 0.0079 | 0.0011 | 0.0068 |
| 45 | 0.0079 | 0.0011 | 0.0069 |
| 46 | 0.0080 | 0.0011 | 0.0069 |
| 47 | 0.0080 | 0.0011 | 0.0069 |
| 48 | 0.0080 | 0.0011 | 0.0069 |
| 49 | 0.0081 | 0.0011 | 0.0070 |
| 50 | 0.0081 | 0.0011 | 0.0070 |
| 51 | 0.0081 | 0.0011 | 0.0070 |
| 52 | 0.0081 | 0.0011 | 0.0071 |
| 53 | 0.0082 | 0.0011 | 0.0071 |
| 54 | 0.0082 | 0.0011 | 0.0071 |
| 55 | 0.0083 | 0.0011 | 0.0071 |
| 56 | 0.0083 | 0.0011 | 0.0072 |
| 57 | 0.0083 | 0.0011 | 0.0072 |
| 58 | 0.0083 | 0.0011 | 0.0072 |
| 59 | 0.0084 | 0.0011 | 0.0073 |
| 60 | 0.0084 | 0.0011 | 0.0073 |
| 61 | 0.0085 | 0.0011 | 0.0073 |
| 62 | 0.0085 | 0.0011 | 0.0074 |
| 63 | 0.0085 | 0.0011 | 0.0074 |
| 64 | 0.0086 | 0.0011 | 0.0074 |
| 65 | 0.0086 | 0.0012 | 0.0075 |
| 66 | 0.0086 | 0.0012 | 0.0075 |
| 67 | 0.0087 | 0.0012 | 0.0075 |
| 68 | 0.0087 | 0.0012 | 0.0076 |
| 69 | 0.0088 | 0.0012 | 0.0076 |
| 70 | 0.0088 | 0.0012 | 0.0076 |
| 71 | 0.0088 | 0.0012 | 0.0077 |
| 72 | 0.0089 | 0.0012 | 0.0077 |
| 73 | 0.0089 | 0.0012 | 0.0077 |
| 74 | 0.0090 | 0.0012 | 0.0078 |
| 75 | 0.0090 | 0.0012 | 0.0078 |
| 76 | 0.0090 | 0.0012 | 0.0078 |
| 77 | 0.0091 | 0.0012 | 0.0079 |
| 78 | 0.0091 | 0.0012 | 0.0079 |
| 79 | 0.0092 | 0.0012 | 0.0080 |
| 80 | 0.0092 | 0.0012 | 0.0080 |
| 81 | 0.0093 | 0.0012 | 0.0080 |
| 82 | 0.0093 | 0.0012 | 0.0081 |
| 83 | 0.0094 | 0.0013 | 0.0081 |
| 84 | 0.0094 | 0.0013 | 0.0082 |
| 85 | 0.0095 | 0.0013 | 0.0082 |
| 86 | 0.0095 | 0.0013 | 0.0082 |
| 87 | 0.0096 | 0.0013 | 0.0083 |
| 88 | 0.0096 | 0.0013 | 0.0083 |
| 89 | 0.0097 | 0.0013 | 0.0084 |

| | | | |
|---|---|---|---|
| 90 | 0.0097 | 0.0013 | 0.0084 |
| 91 | 0.0098 | 0.0013 | 0.0085 |
| 92 | 0.0098 | 0.0013 | 0.0085 |
| 93 | 0.0099 | 0.0013 | 0.0086 |
| 94 | 0.0099 | 0.0013 | 0.0086 |
| 95 | 0.0100 | 0.0013 | 0.0087 |
| 96 | 0.0101 | 0.0013 | 0.0087 |
| 97 | 0.0101 | 0.0014 | 0.0088 |
| 98 | 0.0102 | 0.0014 | 0.0088 |
| 99 | 0.0103 | 0.0014 | 0.0089 |
| 100 | 0.0103 | 0.0014 | 0.0089 |
| 101 | 0.0104 | 0.0014 | 0.0090 |
| 102 | 0.0104 | 0.0014 | 0.0090 |
| 103 | 0.0105 | 0.0014 | 0.0091 |
| 104 | 0.0106 | 0.0014 | 0.0091 |
| 105 | 0.0106 | 0.0014 | 0.0092 |
| 106 | 0.0107 | 0.0014 | 0.0093 |
| 107 | 0.0108 | 0.0014 | 0.0093 |
| 108 | 0.0108 | 0.0014 | 0.0094 |
| 109 | 0.0109 | 0.0015 | 0.0095 |
| 110 | 0.0110 | 0.0015 | 0.0095 |
| 111 | 0.0111 | 0.0015 | 0.0096 |
| 112 | 0.0111 | 0.0015 | 0.0096 |
| 113 | 0.0112 | 0.0015 | 0.0097 |
| 114 | 0.0113 | 0.0015 | 0.0098 |
| 115 | 0.0114 | 0.0015 | 0.0099 |
| 116 | 0.0115 | 0.0015 | 0.0099 |
| 117 | 0.0116 | 0.0015 | 0.0100 |
| 118 | 0.0116 | 0.0016 | 0.0101 |
| 119 | 0.0117 | 0.0016 | 0.0102 |
| 120 | 0.0118 | 0.0016 | 0.0102 |
| 121 | 0.0119 | 0.0016 | 0.0103 |
| 122 | 0.0120 | 0.0016 | 0.0104 |
| 123 | 0.0121 | 0.0016 | 0.0105 |
| 124 | 0.0122 | 0.0016 | 0.0106 |
| 125 | 0.0123 | 0.0016 | 0.0107 |
| 126 | 0.0124 | 0.0017 | 0.0107 |
| 127 | 0.0125 | 0.0017 | 0.0109 |
| 128 | 0.0126 | 0.0017 | 0.0109 |
| 129 | 0.0128 | 0.0017 | 0.0110 |
| 130 | 0.0128 | 0.0017 | 0.0111 |
| 131 | 0.0130 | 0.0017 | 0.0112 |
| 132 | 0.0131 | 0.0017 | 0.0113 |
| 133 | 0.0132 | 0.0018 | 0.0115 |
| 134 | 0.0133 | 0.0018 | 0.0115 |
| 135 | 0.0135 | 0.0018 | 0.0117 |
| 136 | 0.0136 | 0.0018 | 0.0118 |
| 137 | 0.0138 | 0.0018 | 0.0119 |
| 138 | 0.0138 | 0.0019 | 0.0120 |
| 139 | 0.0140 | 0.0019 | 0.0122 |
| 140 | 0.0141 | 0.0019 | 0.0123 |
| 141 | 0.0143 | 0.0019 | 0.0124 |
| 142 | 0.0145 | 0.0019 | 0.0125 |
| 143 | 0.0147 | 0.0020 | 0.0127 |
| 144 | 0.0148 | 0.0020 | 0.0128 |
| 145 | 0.0174 | 0.0023 | 0.0151 |
| 146 | 0.0176 | 0.0023 | 0.0152 |
| 147 | 0.0178 | 0.0024 | 0.0154 |
| 148 | 0.0179 | 0.0024 | 0.0155 |
| 149 | 0.0182 | 0.0024 | 0.0158 |
| 150 | 0.0183 | 0.0025 | 0.0159 |
| 151 | 0.0186 | 0.0025 | 0.0161 |
| 152 | 0.0188 | 0.0025 | 0.0163 |
| 153 | 0.0191 | 0.0026 | 0.0165 |
| 154 | 0.0192 | 0.0026 | 0.0167 |
| 155 | 0.0196 | 0.0026 | 0.0170 |
| 156 | 0.0198 | 0.0026 | 0.0171 |
| 157 | 0.0201 | 0.0027 | 0.0174 |
| 158 | 0.0203 | 0.0027 | 0.0176 |
| 159 | 0.0207 | 0.0028 | 0.0179 |
| 160 | 0.0209 | 0.0028 | 0.0181 |

| | | | |
|---|---|---|---|
| 161 | 0.0213 | 0.0029 | 0.0185 |
| 162 | 0.0216 | 0.0029 | 0.0187 |
| 163 | 0.0220 | 0.0029 | 0.0191 |
| 164 | 0.0223 | 0.0030 | 0.0193 |
| 165 | 0.0228 | 0.0030 | 0.0198 |
| 166 | 0.0231 | 0.0031 | 0.0200 |
| 167 | 0.0237 | 0.0032 | 0.0205 |
| 168 | 0.0240 | 0.0032 | 0.0208 |
| 169 | 0.0246 | 0.0033 | 0.0213 |
| 170 | 0.0250 | 0.0033 | 0.0216 |
| 171 | 0.0257 | 0.0034 | 0.0223 |
| 172 | 0.0261 | 0.0035 | 0.0226 |
| 173 | 0.0270 | 0.0036 | 0.0234 |
| 174 | 0.0275 | 0.0037 | 0.0238 |
| 175 | 0.0285 | 0.0038 | 0.0247 |
| 176 | 0.0290 | 0.0039 | 0.0251 |
| 177 | 0.0302 | 0.0040 | 0.0262 |
| 178 | 0.0309 | 0.0041 | 0.0267 |
| 179 | 0.0323 | 0.0043 | 0.0280 |
| 180 | 0.0331 | 0.0044 | 0.0287 |
| 181 | 0.0349 | 0.0047 | 0.0303 |
| 182 | 0.0360 | 0.0048 | 0.0312 |
| 183 | 0.0383 | 0.0051 | 0.0332 |
| 184 | 0.0397 | 0.0053 | 0.0344 |
| 185 | 0.0341 | 0.0046 | 0.0295 |
| 186 | 0.0360 | 0.0048 | 0.0312 |
| 187 | 0.0409 | 0.0055 | 0.0354 |
| 188 | 0.0441 | 0.0059 | 0.0382 |
| 189 | 0.0531 | 0.0065 | 0.0466 |
| 190 | 0.0600 | 0.0065 | 0.0534 |
| 191 | 0.0857 | 0.0065 | 0.0792 |
| 192 | 0.1179 | 0.0065 | 0.1113 |
| 193 | 0.3689 | 0.0065 | 0.3623 |
| 194 | 0.0698 | 0.0065 | 0.0633 |
| 195 | 0.0480 | 0.0064 | 0.0416 |
| 196 | 0.0382 | 0.0051 | 0.0331 |
| 197 | 0.0412 | 0.0055 | 0.0357 |
| 198 | 0.0371 | 0.0050 | 0.0321 |
| 199 | 0.0340 | 0.0045 | 0.0294 |
| 200 | 0.0316 | 0.0042 | 0.0273 |
| 201 | 0.0296 | 0.0040 | 0.0256 |
| 202 | 0.0279 | 0.0037 | 0.0242 |
| 203 | 0.0266 | 0.0036 | 0.0230 |
| 204 | 0.0254 | 0.0034 | 0.0220 |
| 205 | 0.0243 | 0.0032 | 0.0210 |
| 206 | 0.0234 | 0.0031 | 0.0202 |
| 207 | 0.0225 | 0.0030 | 0.0195 |
| 208 | 0.0218 | 0.0029 | 0.0189 |
| 209 | 0.0211 | 0.0028 | 0.0183 |
| 210 | 0.0205 | 0.0027 | 0.0178 |
| 211 | 0.0199 | 0.0027 | 0.0173 |
| 212 | 0.0194 | 0.0026 | 0.0168 |
| 213 | 0.0189 | 0.0025 | 0.0164 |
| 214 | 0.0185 | 0.0025 | 0.0160 |
| 215 | 0.0181 | 0.0024 | 0.0157 |
| 216 | 0.0177 | 0.0024 | 0.0153 |
| 217 | 0.0149 | 0.0020 | 0.0129 |
| 218 | 0.0146 | 0.0019 | 0.0126 |
| 219 | 0.0142 | 0.0019 | 0.0123 |
| 220 | 0.0139 | 0.0019 | 0.0121 |
| 221 | 0.0137 | 0.0018 | 0.0118 |
| 222 | 0.0134 | 0.0018 | 0.0116 |
| 223 | 0.0131 | 0.0018 | 0.0114 |
| 224 | 0.0129 | 0.0017 | 0.0112 |
| 225 | 0.0127 | 0.0017 | 0.0110 |
| 226 | 0.0125 | 0.0017 | 0.0108 |
| 227 | 0.0123 | 0.0016 | 0.0106 |
| 228 | 0.0121 | 0.0016 | 0.0104 |
| 229 | 0.0119 | 0.0016 | 0.0103 |
| 230 | 0.0117 | 0.0016 | 0.0101 |
| 231 | 0.0115 | 0.0015 | 0.0100 |

| | | | |
|---|---|---|---|
| 232 | 0.0113 | 0.0015 | 0.0098 |
| 233 | 0.0112 | 0.0015 | 0.0097 |
| 234 | 0.0110 | 0.0015 | 0.0096 |
| 235 | 0.0109 | 0.0015 | 0.0094 |
| 236 | 0.0107 | 0.0014 | 0.0093 |
| 237 | 0.0106 | 0.0014 | 0.0092 |
| 238 | 0.0105 | 0.0014 | 0.0091 |
| 239 | 0.0103 | 0.0014 | 0.0090 |
| 240 | 0.0102 | 0.0014 | 0.0088 |
| 241 | 0.0101 | 0.0013 | 0.0087 |
| 242 | 0.0100 | 0.0013 | 0.0086 |
| 243 | 0.0099 | 0.0013 | 0.0085 |
| 244 | 0.0098 | 0.0013 | 0.0085 |
| 245 | 0.0097 | 0.0013 | 0.0084 |
| 246 | 0.0095 | 0.0013 | 0.0083 |
| 247 | 0.0094 | 0.0013 | 0.0082 |
| 248 | 0.0094 | 0.0013 | 0.0081 |
| 249 | 0.0093 | 0.0012 | 0.0080 |
| 250 | 0.0092 | 0.0012 | 0.0079 |
| 251 | 0.0091 | 0.0012 | 0.0079 |
| 252 | 0.0090 | 0.0012 | 0.0078 |
| 253 | 0.0089 | 0.0012 | 0.0077 |
| 254 | 0.0088 | 0.0012 | 0.0076 |
| 255 | 0.0087 | 0.0012 | 0.0076 |
| 256 | 0.0087 | 0.0012 | 0.0075 |
| 257 | 0.0086 | 0.0011 | 0.0074 |
| 258 | 0.0085 | 0.0011 | 0.0074 |
| 259 | 0.0084 | 0.0011 | 0.0073 |
| 260 | 0.0084 | 0.0011 | 0.0072 |
| 261 | 0.0083 | 0.0011 | 0.0072 |
| 262 | 0.0082 | 0.0011 | 0.0071 |
| 263 | 0.0082 | 0.0011 | 0.0071 |
| 264 | 0.0081 | 0.0011 | 0.0070 |
| 265 | 0.0080 | 0.0011 | 0.0070 |
| 266 | 0.0080 | 0.0011 | 0.0069 |
| 267 | 0.0079 | 0.0011 | 0.0069 |
| 268 | 0.0079 | 0.0011 | 0.0068 |
| 269 | 0.0078 | 0.0010 | 0.0068 |
| 270 | 0.0077 | 0.0010 | 0.0067 |
| 271 | 0.0077 | 0.0010 | 0.0067 |
| 272 | 0.0076 | 0.0010 | 0.0066 |
| 273 | 0.0076 | 0.0010 | 0.0066 |
| 274 | 0.0075 | 0.0010 | 0.0065 |
| 275 | 0.0075 | 0.0010 | 0.0065 |
| 276 | 0.0074 | 0.0010 | 0.0064 |
| 277 | 0.0074 | 0.0010 | 0.0064 |
| 278 | 0.0073 | 0.0010 | 0.0063 |
| 279 | 0.0073 | 0.0010 | 0.0063 |
| 280 | 0.0072 | 0.0010 | 0.0063 |
| 281 | 0.0072 | 0.0010 | 0.0062 |
| 282 | 0.0071 | 0.0010 | 0.0062 |
| 283 | 0.0071 | 0.0009 | 0.0061 |
| 284 | 0.0070 | 0.0009 | 0.0061 |
| 285 | 0.0070 | 0.0009 | 0.0061 |
| 286 | 0.0070 | 0.0009 | 0.0060 |
| 287 | 0.0069 | 0.0009 | 0.0060 |
| 288 | 0.0069 | 0.0009 | 0.0060 |

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Total soil rain loss = 0.54(In)
Total effective rainfall = 3.98(In)
Peak flow rate in flood hydrograph = 18.01(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

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Hydrograph in 5 Minute intervals ((CFS))

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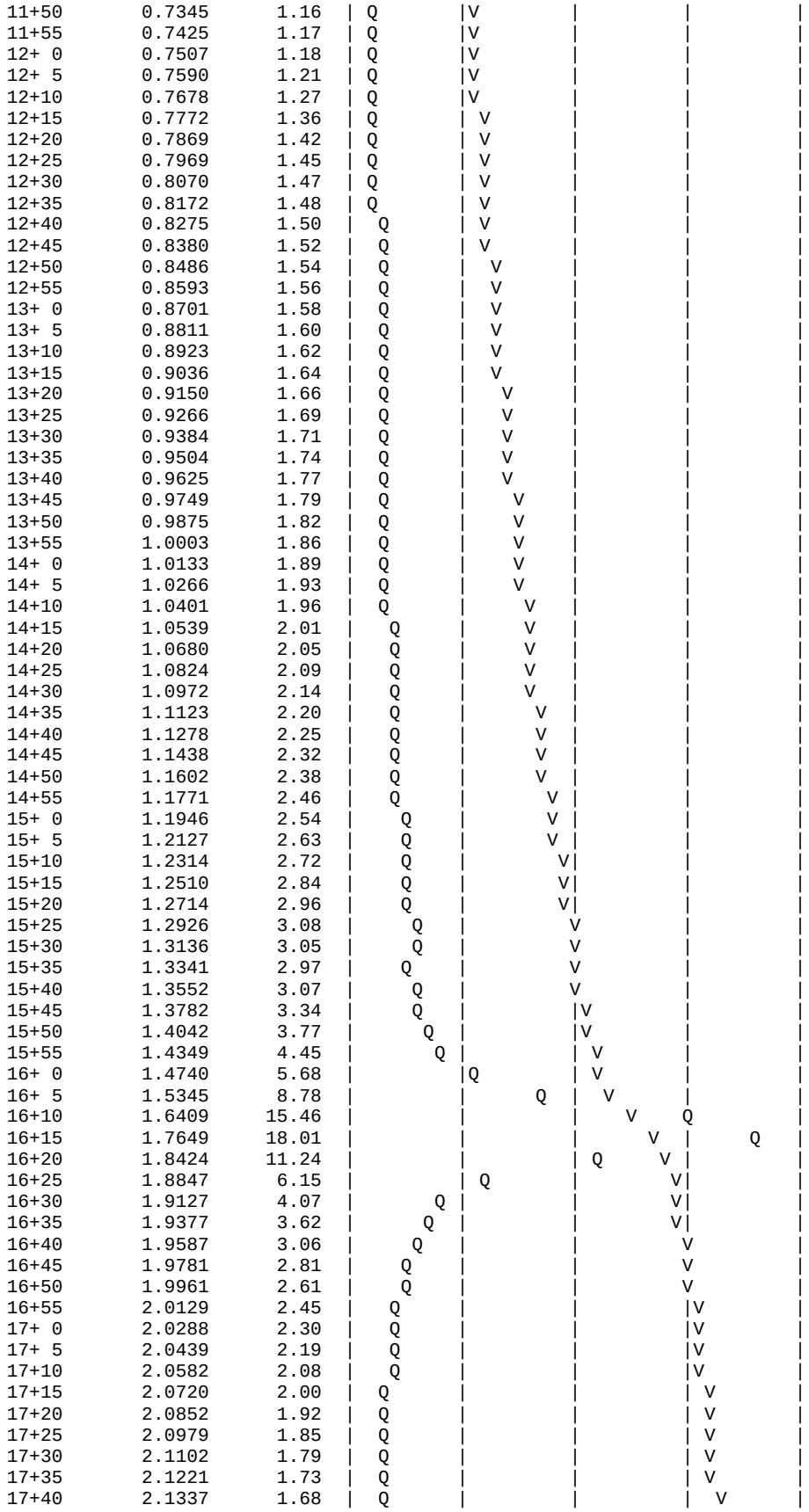
Time(h+m) Volume Ac.Ft Q(CFS) 0 5.0 10.0 15.0 20.0

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0002 | 0.03 | Q | | | | |
| 0+10 | 0.0014 | 0.18 | Q | | | | |
| 0+15 | 0.0041 | 0.40 | Q | | | | |
| 0+20 | 0.0077 | 0.51 | VQ | | | | |
| 0+25 | 0.0114 | 0.55 | VQ | | | | |
| 0+30 | 0.0153 | 0.56 | VQ | | | | |
| 0+35 | 0.0192 | 0.57 | VQ | | | | |
| 0+40 | 0.0231 | 0.57 | VQ | | | | |
| 0+45 | 0.0270 | 0.57 | VQ | | | | |
| 0+50 | 0.0309 | 0.57 | VQ | | | | |
| 0+55 | 0.0349 | 0.57 | VQ | | | | |
| 1+ 0 | 0.0388 | 0.57 | VQ | | | | |
| 1+ 5 | 0.0428 | 0.58 | VQ | | | | |
| 1+10 | 0.0468 | 0.58 | VQ | | | | |
| 1+15 | 0.0508 | 0.58 | VQ | | | | |
| 1+20 | 0.0548 | 0.58 | VQ | | | | |
| 1+25 | 0.0588 | 0.58 | VQ | | | | |
| 1+30 | 0.0628 | 0.59 | VQ | | | | |
| 1+35 | 0.0669 | 0.59 | \|Q | | | | |
| 1+40 | 0.0710 | 0.59 | \|Q | | | | |
| 1+45 | 0.0750 | 0.59 | \|Q | | | | |
| 1+50 | 0.0791 | 0.59 | \|Q | | | | |
| 1+55 | 0.0832 | 0.60 | \|Q | | | | |
| 2+ 0 | 0.0873 | 0.60 | \|Q | | | | |
| 2+ 5 | 0.0914 | 0.60 | \|Q | | | | |
| 2+10 | 0.0956 | 0.60 | \|Q | | | | |
| 2+15 | 0.0997 | 0.60 | \|Q | | | | |
| 2+20 | 0.1039 | 0.61 | \|Q | | | | |
| 2+25 | 0.1081 | 0.61 | \|Q | | | | |
| 2+30 | 0.1123 | 0.61 | \|Q | | | | |
| 2+35 | 0.1165 | 0.61 | \|Q | | | | |
| 2+40 | 0.1207 | 0.61 | \|Q | | | | |
| 2+45 | 0.1250 | 0.62 | \|Q | | | | |
| 2+50 | 0.1292 | 0.62 | \|QV | | | | |
| 2+55 | 0.1335 | 0.62 | \|QV | | | | |
| 3+ 0 | 0.1378 | 0.62 | \|QV | | | | |
| 3+ 5 | 0.1421 | 0.62 | \|QV | | | | |
| 3+10 | 0.1464 | 0.63 | \|QV | | | | |
| 3+15 | 0.1507 | 0.63 | \|QV | | | | |
| 3+20 | 0.1551 | 0.63 | \|QV | | | | |
| 3+25 | 0.1594 | 0.63 | \|QV | | | | |
| 3+30 | 0.1638 | 0.64 | \|QV | | | | |
| 3+35 | 0.1682 | 0.64 | \|QV | | | | |
| 3+40 | 0.1726 | 0.64 | \|QV | | | | |
| 3+45 | 0.1770 | 0.64 | \|QV | | | | |
| 3+50 | 0.1815 | 0.65 | \|QV | | | | |
| 3+55 | 0.1859 | 0.65 | \|QV | | | | |
| 4+ 0 | 0.1904 | 0.65 | \|QV | | | | |
| 4+ 5 | 0.1949 | 0.65 | \|Q V | | | | |
| 4+10 | 0.1994 | 0.66 | \|Q V | | | | |
| 4+15 | 0.2040 | 0.66 | \|Q V | | | | |
| 4+20 | 0.2085 | 0.66 | \|Q V | | | | |
| 4+25 | 0.2131 | 0.66 | \|Q V | | | | |
| 4+30 | 0.2177 | 0.67 | \|Q V | | | | |
| 4+35 | 0.2223 | 0.67 | \|Q V | | | | |
| 4+40 | 0.2269 | 0.67 | \|Q V | | | | |
| 4+45 | 0.2315 | 0.67 | \|Q V | | | | |
| 4+50 | 0.2362 | 0.68 | \|Q V | | | | |
| 4+55 | 0.2409 | 0.68 | \|Q V | | | | |
| 5+ 0 | 0.2456 | 0.68 | \|Q V | | | | |
| 5+ 5 | 0.2503 | 0.69 | \|Q V | | | | |
| 5+10 | 0.2550 | 0.69 | \|Q V | | | | |
| 5+15 | 0.2598 | 0.69 | \|Q  V | | | | |
| 5+20 | 0.2646 | 0.69 | \|Q  V | | | | |
| 5+25 | 0.2694 | 0.70 | \|Q  V | | | | |
| 5+30 | 0.2742 | 0.70 | \|Q  V | | | | |
| 5+35 | 0.2790 | 0.70 | \|Q  V | | | | |
| 5+40 | 0.2839 | 0.71 | \|Q  V | | | | |
| 5+45 | 0.2888 | 0.71 | \|Q  V | | | | |
| 5+50 | 0.2937 | 0.71 | \|Q  V | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5+55 | 0.2986 | 0.72 | Q V | | | |
| 6+ 0 | 0.3036 | 0.72 | Q V | | | |
| 6+ 5 | 0.3085 | 0.72 | Q V | | | |
| 6+10 | 0.3135 | 0.73 | Q V | | | |
| 6+15 | 0.3186 | 0.73 | Q V | | | |
| 6+20 | 0.3236 | 0.73 | Q V | | | |
| 6+25 | 0.3287 | 0.74 | Q V | | | |
| 6+30 | 0.3338 | 0.74 | Q V | | | |
| 6+35 | 0.3389 | 0.74 | Q V | | | |
| 6+40 | 0.3440 | 0.75 | Q V | | | |
| 6+45 | 0.3492 | 0.75 | Q V | | | |
| 6+50 | 0.3544 | 0.75 | Q V | | | |
| 6+55 | 0.3596 | 0.76 | Q V | | | |
| 7+ 0 | 0.3649 | 0.76 | Q V | | | |
| 7+ 5 | 0.3701 | 0.77 | Q V | | | |
| 7+10 | 0.3754 | 0.77 | Q V | | | |
| 7+15 | 0.3808 | 0.77 | Q V | | | |
| 7+20 | 0.3861 | 0.78 | Q V | | | |
| 7+25 | 0.3915 | 0.78 | Q V | | | |
| 7+30 | 0.3969 | 0.79 | Q V | | | |
| 7+35 | 0.4024 | 0.79 | Q V | | | |
| 7+40 | 0.4079 | 0.79 | Q V | | | |
| 7+45 | 0.4134 | 0.80 | Q V | | | |
| 7+50 | 0.4189 | 0.80 | Q V | | | |
| 7+55 | 0.4245 | 0.81 | Q V | | | |
| 8+ 0 | 0.4301 | 0.81 | Q V | | | |
| 8+ 5 | 0.4357 | 0.82 | Q V | | | |
| 8+10 | 0.4414 | 0.82 | Q V | | | |
| 8+15 | 0.4470 | 0.83 | Q V | | | |
| 8+20 | 0.4528 | 0.83 | Q V | | | |
| 8+25 | 0.4585 | 0.84 | Q V | | | |
| 8+30 | 0.4643 | 0.84 | Q V | | | |
| 8+35 | 0.4702 | 0.85 | Q V | | | |
| 8+40 | 0.4761 | 0.85 | Q V | | | |
| 8+45 | 0.4820 | 0.86 | Q V | | | |
| 8+50 | 0.4879 | 0.86 | Q V | | | |
| 8+55 | 0.4939 | 0.87 | Q V | | | |
| 9+ 0 | 0.4999 | 0.87 | Q V | | | |
| 9+ 5 | 0.5060 | 0.88 | Q V | | | |
| 9+10 | 0.5121 | 0.89 | Q V | | | |
| 9+15 | 0.5182 | 0.89 | Q V | | | |
| 9+20 | 0.5244 | 0.90 | Q V | | | |
| 9+25 | 0.5306 | 0.90 | Q V | | | |
| 9+30 | 0.5369 | 0.91 | Q V | | | |
| 9+35 | 0.5432 | 0.92 | Q V | | | |
| 9+40 | 0.5496 | 0.92 | Q V | | | |
| 9+45 | 0.5560 | 0.93 | Q V | | | |
| 9+50 | 0.5624 | 0.94 | Q V | | | |
| 9+55 | 0.5689 | 0.94 | Q V | | | |
| 10+ 0 | 0.5755 | 0.95 | Q V | | | |
| 10+ 5 | 0.5821 | 0.96 | Q V | | | |
| 10+10 | 0.5887 | 0.97 | Q V | | | |
| 10+15 | 0.5954 | 0.97 | Q V | | | |
| 10+20 | 0.6022 | 0.98 | Q V | | | |
| 10+25 | 0.6090 | 0.99 | Q V | | | |
| 10+30 | 0.6159 | 1.00 | Q V | | | |
| 10+35 | 0.6228 | 1.01 | Q V | | | |
| 10+40 | 0.6298 | 1.01 | Q V | | | |
| 10+45 | 0.6368 | 1.02 | Q V | | | |
| 10+50 | 0.6439 | 1.03 | Q V | | | |
| 10+55 | 0.6511 | 1.04 | Q V | | | |
| 11+ 0 | 0.6583 | 1.05 | Q V | | | |
| 11+ 5 | 0.6656 | 1.06 | Q V | | | |
| 11+10 | 0.6730 | 1.07 | Q V | | | |
| 11+15 | 0.6804 | 1.08 | Q V | | | |
| 11+20 | 0.6879 | 1.09 | Q V | | | |
| 11+25 | 0.6955 | 1.10 | Q V | | | |
| 11+30 | 0.7031 | 1.11 | Q V | | | |
| 11+35 | 0.7108 | 1.12 | Q V | | | |
| 11+40 | 0.7186 | 1.13 | Q V | | | |
| 11+45 | 0.7265 | 1.15 | Q V | | | |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17+45 | 2.1450 | 1.63 | \| Q | \| | \| | \| V | \| |
| 17+50 | 2.1559 | 1.59 | \| Q | \| | \| | \| V | \| |
| 17+55 | 2.1666 | 1.55 | \| Q | \| | \| | \| V | \| |
| 18+ 0 | 2.1770 | 1.51 | \| Q | \| | \| | \| V | \| |
| 18+ 5 | 2.1871 | 1.47 | \| Q | \| | \| | \| V | \| |
| 18+10 | 2.1967 | 1.39 | \| Q | \| | \| | \| V | \| |
| 18+15 | 2.2055 | 1.28 | \| Q | \| | \| | \| V | \| |
| 18+20 | 2.2138 | 1.21 | \| Q | \| | \| | \| V | \| |
| 18+25 | 2.2219 | 1.17 | \| Q | \| | \| | \| V | \| |
| 18+30 | 2.2298 | 1.14 | \| Q | \| | \| | \| V | \| |
| 18+35 | 2.2375 | 1.12 | \| Q | \| | \| | \| V | \| |
| 18+40 | 2.2450 | 1.10 | \| Q | \| | \| | \| V | \| |
| 18+45 | 2.2524 | 1.08 | \| Q | \| | \| | \| V | \| |
| 18+50 | 2.2597 | 1.06 | \| Q | \| | \| | \| V | \| |
| 18+55 | 2.2668 | 1.04 | \| Q | \| | \| | \| V | \| |
| 19+ 0 | 2.2739 | 1.02 | \| Q | \| | \| | \| V | \| |
| 19+ 5 | 2.2808 | 1.00 | \| Q | \| | \| | \| V | \| |
| 19+10 | 2.2876 | 0.99 | \|Q | \| | \| | \| V | \| |
| 19+15 | 2.2942 | 0.97 | \|Q | \| | \| | \| V | \| |
| 19+20 | 2.3008 | 0.96 | \|Q | \| | \| | \| V | \| |
| 19+25 | 2.3073 | 0.94 | \|Q | \| | \| | \| V | \| |
| 19+30 | 2.3137 | 0.93 | \|Q | \| | \| | \| V | \| |
| 19+35 | 2.3200 | 0.91 | \|Q | \| | \| | \| V | \| |
| 19+40 | 2.3262 | 0.90 | \|Q | \| | \| | \| V | \| |
| 19+45 | 2.3324 | 0.89 | \|Q | \| | \| | \| V | \| |
| 19+50 | 2.3384 | 0.88 | \|Q | \| | \| | \| V | \| |
| 19+55 | 2.3444 | 0.87 | \|Q | \| | \| | \| V | \| |
| 20+ 0 | 2.3503 | 0.86 | \|Q | \| | \| | \| V | \| |
| 20+ 5 | 2.3561 | 0.85 | \|Q | \| | \| | \| V | \| |
| 20+10 | 2.3619 | 0.84 | \|Q | \| | \| | \| V | \| |
| 20+15 | 2.3675 | 0.83 | \|Q | \| | \| | \| V | \| |
| 20+20 | 2.3732 | 0.82 | \|Q | \| | \| | \| V | \| |
| 20+25 | 2.3787 | 0.81 | \|Q | \| | \| | \| V | \| |
| 20+30 | 2.3842 | 0.80 | \|Q | \| | \| | \| V | \| |
| 20+35 | 2.3896 | 0.79 | \|Q | \| | \| | \| V | \| |
| 20+40 | 2.3950 | 0.78 | \|Q | \| | \| | \| V | \| |
| 20+45 | 2.4003 | 0.77 | \|Q | \| | \| | \| V | \| |
| 20+50 | 2.4056 | 0.76 | \|Q | \| | \| | \| V | \| |
| 20+55 | 2.4108 | 0.76 | \|Q | \| | \| | \| V | \| |
| 21+ 0 | 2.4160 | 0.75 | \|Q | \| | \| | \| V | \| |
| 21+ 5 | 2.4211 | 0.74 | \|Q | \| | \| | \| V | \| |
| 21+10 | 2.4262 | 0.74 | \|Q | \| | \| | \| V | \| |
| 21+15 | 2.4312 | 0.73 | \|Q | \| | \| | \| V | \| |
| 21+20 | 2.4361 | 0.72 | \|Q | \| | \| | \| V | \| |
| 21+25 | 2.4411 | 0.71 | \|Q | \| | \| | \| V | \| |
| 21+30 | 2.4459 | 0.71 | \|Q | \| | \| | \| V | \| |
| 21+35 | 2.4508 | 0.70 | \|Q | \| | \| | \| V | \| |
| 21+40 | 2.4556 | 0.70 | \|Q | \| | \| | \| V | \| |
| 21+45 | 2.4603 | 0.69 | \|Q | \| | \| | \| V | \| |
| 21+50 | 2.4650 | 0.68 | \|Q | \| | \| | \| V | \| |
| 21+55 | 2.4697 | 0.68 | \|Q | \| | \| | \| V | \| |
| 22+ 0 | 2.4744 | 0.67 | \|Q | \| | \| | \| V | \| |
| 22+ 5 | 2.4789 | 0.67 | \|Q | \| | \| | \| V | \| |
| 22+10 | 2.4835 | 0.66 | \|Q | \| | \| | \| V | \| |
| 22+15 | 2.4880 | 0.66 | \|Q | \| | \| | \| V | \| |
| 22+20 | 2.4925 | 0.65 | \|Q | \| | \| | \| V | \| |
| 22+25 | 2.4970 | 0.65 | \|Q | \| | \| | \| V | \| |
| 22+30 | 2.5014 | 0.64 | \|Q | \| | \| | \| V | \| |
| 22+35 | 2.5058 | 0.64 | \|Q | \| | \| | \| V | \| |
| 22+40 | 2.5101 | 0.63 | \|Q | \| | \| | \| V | \| |
| 22+45 | 2.5145 | 0.63 | \|Q | \| | \| | \| V | \| |
| 22+50 | 2.5188 | 0.62 | \|Q | \| | \| | \| V | \| |
| 22+55 | 2.5230 | 0.62 | \|Q | \| | \| | \| V | \| |
| 23+ 0 | 2.5273 | 0.61 | \|Q | \| | \| | \| V | \| |
| 23+ 5 | 2.5315 | 0.61 | \|Q | \| | \| | \| V | \| |
| 23+10 | 2.5357 | 0.61 | \|Q | \| | \| | \| V | \| |
| 23+15 | 2.5398 | 0.60 | \|Q | \| | \| | \| V | \| |
| 23+20 | 2.5439 | 0.60 | \|Q | \| | \| | \| V | \| |
| 23+25 | 2.5480 | 0.59 | \|Q | \| | \| | \| V | \| |
| 23+30 | 2.5521 | 0.59 | \|Q | \| | \| | \| V | \| |
| 23+35 | 2.5561 | 0.59 | \|Q | \| | \| | \| V | \| |

```
   23+40       2.5601      0.58  |Q        |         |         |        V|
   23+45       2.5641      0.58  |Q        |         |         |        V|
   23+50       2.5681      0.58  |Q        |         |         |        V|
   23+55       2.5720      0.57  |Q        |         |         |        V|
   24+ 0       2.5760      0.57  |Q        |         |         |        V|
   24+ 5       2.5797      0.54  |Q        |         |         |        V|
   24+10       2.5823      0.39  Q         |         |         |        V|
   24+15       2.5834      0.16  Q         |         |         |        V|
   24+20       2.5838      0.05  Q         |         |         |        V|
   24+25       2.5839      0.01  Q         |         |         |        V|
   24+30       2.5839      0.01  Q         |         |         |        V|
-------------------------------------------------------------------------
```

# Unit Hydrograph Analysis: Developed Condition (10 yr, 24 hr Storm Event)

```
       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  07/01/23

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


Program License Serial Number 6484

------------------------------------------------------------------------
UH ANALYSIS
DEVELOPED CONDITION
10-YR STORM EVENT

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

       Storm Event Year = 10

       Antecedent Moisture Condition = 3

 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        Duration        Isohyetal
       (Ac.)            (hours)         (In)
Rainfall data for year 10
            7.80            1           0.81
------------------------------------------------------------------------
Rainfall data for year 10
            7.80            6           2.06
------------------------------------------------------------------------
Rainfall data for year 10
            7.80           24           3.77
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      52.0          7.80      1.000     0.785    0.100    0.079

Area-averaged adjusted loss rate Fm (In/Hr) =  0.079

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
     0.78   0.100         32.0      52.0       9.23     0.088
     7.02   0.900         98.0      98.0       0.20     0.938

Area-averaged catchment yield fraction, Y =  0.853
Area-averaged low loss fraction, Yb =  0.147
Direct entry of lag time by user
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Watershed area = 7.80(Ac.)
Catchment Lag time = 0.163 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 51.1876
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.147 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.302(In)
Computed peak 30-minute rainfall = 0.618(In)
Specified peak 1-hour rainfall = 0.815(In)
Computed peak 3-hour rainfall = 1.439(In)
Specified peak 6-hour rainfall = 2.060(In)
Specified peak 24-hour rainfall = 3.770(In)

Rainfall depth area reduction factors:
Using a total area of 7.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.302(In)
30-minute factor = 1.000 Adjusted rainfall = 0.617(In)
1-hour factor = 1.000 Adjusted rainfall = 0.815(In)
3-hour factor = 1.000 Adjusted rainfall = 1.439(In)
6-hour factor = 1.000 Adjusted rainfall = 2.060(In)
24-hour factor = 1.000 Adjusted rainfall = 3.770(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 = 94.33 (CFS)) | |
| 1 | 4.788 | 4.516 |
| 2 | 31.153 | 24.871 |
| 3 | 70.637 | 37.245 |
| 4 | 90.873 | 19.089 |
| 5 | 97.349 | 6.109 |
| 6 | 98.868 | 1.432 |
| 7 | 100.000 | 1.068 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3015 | 0.3015 |
| 2 | 0.3979 | 0.0963 |
| 3 | 0.4679 | 0.0701 |
| 4 | 0.5250 | 0.0571 |
| 5 | 0.5740 | 0.0490 |
| 6 | 0.6174 | 0.0434 |
| 7 | 0.6567 | 0.0393 |
| 8 | 0.6927 | 0.0360 |
| 9 | 0.7261 | 0.0334 |
| 10 | 0.7574 | 0.0313 |
| 11 | 0.7868 | 0.0294 |
| 12 | 0.8147 | 0.0279 |
| 13 | 0.8492 | 0.0345 |
| 14 | 0.8824 | 0.0332 |
| 15 | 0.9145 | 0.0321 |
| 16 | 0.9456 | 0.0311 |
| 17 | 0.9757 | 0.0302 |
| 18 | 1.0050 | 0.0293 |
| 19 | 1.0336 | 0.0285 |
| 20 | 1.0614 | 0.0278 |
| 21 | 1.0885 | 0.0272 |
| 22 | 1.1151 | 0.0265 |
| 23 | 1.1411 | 0.0260 |
| 24 | 1.1665 | 0.0254 |
| 25 | 1.1914 | 0.0249 |
| 26 | 1.2158 | 0.0244 |
| 27 | 1.2398 | 0.0240 |

| | | |
|---|---|---|
| 28 | 1.2634 | 0.0236 |
| 29 | 1.2866 | 0.0232 |
| 30 | 1.3094 | 0.0228 |
| 31 | 1.3318 | 0.0224 |
| 32 | 1.3538 | 0.0221 |
| 33 | 1.3756 | 0.0217 |
| 34 | 1.3970 | 0.0214 |
| 35 | 1.4182 | 0.0211 |
| 36 | 1.4390 | 0.0208 |
| 37 | 1.4595 | 0.0206 |
| 38 | 1.4798 | 0.0203 |
| 39 | 1.4999 | 0.0200 |
| 40 | 1.5196 | 0.0198 |
| 41 | 1.5392 | 0.0195 |
| 42 | 1.5585 | 0.0193 |
| 43 | 1.5776 | 0.0191 |
| 44 | 1.5965 | 0.0189 |
| 45 | 1.6152 | 0.0187 |
| 46 | 1.6336 | 0.0185 |
| 47 | 1.6519 | 0.0183 |
| 48 | 1.6700 | 0.0181 |
| 49 | 1.6879 | 0.0179 |
| 50 | 1.7057 | 0.0177 |
| 51 | 1.7232 | 0.0176 |
| 52 | 1.7406 | 0.0174 |
| 53 | 1.7579 | 0.0172 |
| 54 | 1.7750 | 0.0171 |
| 55 | 1.7919 | 0.0169 |
| 56 | 1.8087 | 0.0168 |
| 57 | 1.8254 | 0.0166 |
| 58 | 1.8419 | 0.0165 |
| 59 | 1.8582 | 0.0164 |
| 60 | 1.8745 | 0.0162 |
| 61 | 1.8906 | 0.0161 |
| 62 | 1.9065 | 0.0160 |
| 63 | 1.9224 | 0.0159 |
| 64 | 1.9381 | 0.0157 |
| 65 | 1.9537 | 0.0156 |
| 66 | 1.9692 | 0.0155 |
| 67 | 1.9846 | 0.0154 |
| 68 | 1.9999 | 0.0153 |
| 69 | 2.0151 | 0.0152 |
| 70 | 2.0301 | 0.0151 |
| 71 | 2.0451 | 0.0150 |
| 72 | 2.0599 | 0.0149 |
| 73 | 2.0724 | 0.0124 |
| 74 | 2.0847 | 0.0123 |
| 75 | 2.0969 | 0.0122 |
| 76 | 2.1091 | 0.0121 |
| 77 | 2.1211 | 0.0121 |
| 78 | 2.1331 | 0.0120 |
| 79 | 2.1450 | 0.0119 |
| 80 | 2.1568 | 0.0118 |
| 81 | 2.1685 | 0.0117 |
| 82 | 2.1801 | 0.0116 |
| 83 | 2.1917 | 0.0116 |
| 84 | 2.2031 | 0.0115 |
| 85 | 2.2145 | 0.0114 |
| 86 | 2.2259 | 0.0113 |
| 87 | 2.2371 | 0.0112 |
| 88 | 2.2483 | 0.0112 |
| 89 | 2.2594 | 0.0111 |
| 90 | 2.2704 | 0.0110 |
| 91 | 2.2814 | 0.0110 |
| 92 | 2.2923 | 0.0109 |
| 93 | 2.3031 | 0.0108 |
| 94 | 2.3139 | 0.0108 |
| 95 | 2.3246 | 0.0107 |
| 96 | 2.3352 | 0.0106 |
| 97 | 2.3458 | 0.0106 |
| 98 | 2.3563 | 0.0105 |

| | | |
|---|---|---|
| 99 | 2.3668 | 0.0105 |
| 100 | 2.3771 | 0.0104 |
| 101 | 2.3875 | 0.0103 |
| 102 | 2.3978 | 0.0103 |
| 103 | 2.4080 | 0.0102 |
| 104 | 2.4181 | 0.0102 |
| 105 | 2.4282 | 0.0101 |
| 106 | 2.4383 | 0.0101 |
| 107 | 2.4483 | 0.0100 |
| 108 | 2.4583 | 0.0099 |
| 109 | 2.4682 | 0.0099 |
| 110 | 2.4780 | 0.0098 |
| 111 | 2.4878 | 0.0098 |
| 112 | 2.4975 | 0.0097 |
| 113 | 2.5072 | 0.0097 |
| 114 | 2.5169 | 0.0096 |
| 115 | 2.5265 | 0.0096 |
| 116 | 2.5360 | 0.0096 |
| 117 | 2.5456 | 0.0095 |
| 118 | 2.5550 | 0.0095 |
| 119 | 2.5644 | 0.0094 |
| 120 | 2.5738 | 0.0094 |
| 121 | 2.5831 | 0.0093 |
| 122 | 2.5924 | 0.0093 |
| 123 | 2.6017 | 0.0092 |
| 124 | 2.6109 | 0.0092 |
| 125 | 2.6200 | 0.0092 |
| 126 | 2.6291 | 0.0091 |
| 127 | 2.6382 | 0.0091 |
| 128 | 2.6473 | 0.0090 |
| 129 | 2.6563 | 0.0090 |
| 130 | 2.6652 | 0.0090 |
| 131 | 2.6741 | 0.0089 |
| 132 | 2.6830 | 0.0089 |
| 133 | 2.6919 | 0.0088 |
| 134 | 2.7007 | 0.0088 |
| 135 | 2.7094 | 0.0088 |
| 136 | 2.7182 | 0.0087 |
| 137 | 2.7269 | 0.0087 |
| 138 | 2.7355 | 0.0087 |
| 139 | 2.7441 | 0.0086 |
| 140 | 2.7527 | 0.0086 |
| 141 | 2.7613 | 0.0086 |
| 142 | 2.7698 | 0.0085 |
| 143 | 2.7783 | 0.0085 |
| 144 | 2.7867 | 0.0085 |
| 145 | 2.7952 | 0.0084 |
| 146 | 2.8036 | 0.0084 |
| 147 | 2.8119 | 0.0084 |
| 148 | 2.8202 | 0.0083 |
| 149 | 2.8285 | 0.0083 |
| 150 | 2.8368 | 0.0083 |
| 151 | 2.8450 | 0.0082 |
| 152 | 2.8532 | 0.0082 |
| 153 | 2.8614 | 0.0082 |
| 154 | 2.8695 | 0.0081 |
| 155 | 2.8776 | 0.0081 |
| 156 | 2.8857 | 0.0081 |
| 157 | 2.8938 | 0.0081 |
| 158 | 2.9018 | 0.0080 |
| 159 | 2.9098 | 0.0080 |
| 160 | 2.9177 | 0.0080 |
| 161 | 2.9257 | 0.0079 |
| 162 | 2.9336 | 0.0079 |
| 163 | 2.9415 | 0.0079 |
| 164 | 2.9493 | 0.0079 |
| 165 | 2.9571 | 0.0078 |
| 166 | 2.9649 | 0.0078 |
| 167 | 2.9727 | 0.0078 |
| 168 | 2.9805 | 0.0077 |
| 169 | 2.9882 | 0.0077 |

| | | |
|---|---|---|
| 170 | 2.9959 | 0.0077 |
| 171 | 3.0036 | 0.0077 |
| 172 | 3.0112 | 0.0076 |
| 173 | 3.0188 | 0.0076 |
| 174 | 3.0264 | 0.0076 |
| 175 | 3.0340 | 0.0076 |
| 176 | 3.0415 | 0.0075 |
| 177 | 3.0490 | 0.0075 |
| 178 | 3.0565 | 0.0075 |
| 179 | 3.0640 | 0.0075 |
| 180 | 3.0715 | 0.0075 |
| 181 | 3.0789 | 0.0074 |
| 182 | 3.0863 | 0.0074 |
| 183 | 3.0937 | 0.0074 |
| 184 | 3.1010 | 0.0074 |
| 185 | 3.1084 | 0.0073 |
| 186 | 3.1157 | 0.0073 |
| 187 | 3.1230 | 0.0073 |
| 188 | 3.1303 | 0.0073 |
| 189 | 3.1375 | 0.0072 |
| 190 | 3.1447 | 0.0072 |
| 191 | 3.1519 | 0.0072 |
| 192 | 3.1591 | 0.0072 |
| 193 | 3.1663 | 0.0072 |
| 194 | 3.1734 | 0.0071 |
| 195 | 3.1805 | 0.0071 |
| 196 | 3.1876 | 0.0071 |
| 197 | 3.1947 | 0.0071 |
| 198 | 3.2018 | 0.0071 |
| 199 | 3.2088 | 0.0070 |
| 200 | 3.2158 | 0.0070 |
| 201 | 3.2228 | 0.0070 |
| 202 | 3.2298 | 0.0070 |
| 203 | 3.2368 | 0.0070 |
| 204 | 3.2437 | 0.0069 |
| 205 | 3.2507 | 0.0069 |
| 206 | 3.2576 | 0.0069 |
| 207 | 3.2644 | 0.0069 |
| 208 | 3.2713 | 0.0069 |
| 209 | 3.2782 | 0.0068 |
| 210 | 3.2850 | 0.0068 |
| 211 | 3.2918 | 0.0068 |
| 212 | 3.2986 | 0.0068 |
| 213 | 3.3054 | 0.0068 |
| 214 | 3.3121 | 0.0068 |
| 215 | 3.3189 | 0.0067 |
| 216 | 3.3256 | 0.0067 |
| 217 | 3.3323 | 0.0067 |
| 218 | 3.3390 | 0.0067 |
| 219 | 3.3456 | 0.0067 |
| 220 | 3.3523 | 0.0067 |
| 221 | 3.3589 | 0.0066 |
| 222 | 3.3655 | 0.0066 |
| 223 | 3.3721 | 0.0066 |
| 224 | 3.3787 | 0.0066 |
| 225 | 3.3853 | 0.0066 |
| 226 | 3.3918 | 0.0066 |
| 227 | 3.3984 | 0.0065 |
| 228 | 3.4049 | 0.0065 |
| 229 | 3.4114 | 0.0065 |
| 230 | 3.4179 | 0.0065 |
| 231 | 3.4244 | 0.0065 |
| 232 | 3.4308 | 0.0065 |
| 233 | 3.4373 | 0.0064 |
| 234 | 3.4437 | 0.0064 |
| 235 | 3.4501 | 0.0064 |
| 236 | 3.4565 | 0.0064 |
| 237 | 3.4629 | 0.0064 |
| 238 | 3.4692 | 0.0064 |
| 239 | 3.4756 | 0.0063 |
| 240 | 3.4819 | 0.0063 |

| | | |
|---|---|---|
| 241 | 3.4882 | 0.0063 |
| 242 | 3.4945 | 0.0063 |
| 243 | 3.5008 | 0.0063 |
| 244 | 3.5071 | 0.0063 |
| 245 | 3.5133 | 0.0063 |
| 246 | 3.5196 | 0.0062 |
| 247 | 3.5258 | 0.0062 |
| 248 | 3.5320 | 0.0062 |
| 249 | 3.5382 | 0.0062 |
| 250 | 3.5444 | 0.0062 |
| 251 | 3.5506 | 0.0062 |
| 252 | 3.5568 | 0.0062 |
| 253 | 3.5629 | 0.0061 |
| 254 | 3.5690 | 0.0061 |
| 255 | 3.5752 | 0.0061 |
| 256 | 3.5813 | 0.0061 |
| 257 | 3.5874 | 0.0061 |
| 258 | 3.5934 | 0.0061 |
| 259 | 3.5995 | 0.0061 |
| 260 | 3.6056 | 0.0061 |
| 261 | 3.6116 | 0.0060 |
| 262 | 3.6176 | 0.0060 |
| 263 | 3.6236 | 0.0060 |
| 264 | 3.6296 | 0.0060 |
| 265 | 3.6356 | 0.0060 |
| 266 | 3.6416 | 0.0060 |
| 267 | 3.6476 | 0.0060 |
| 268 | 3.6535 | 0.0059 |
| 269 | 3.6594 | 0.0059 |
| 270 | 3.6654 | 0.0059 |
| 271 | 3.6713 | 0.0059 |
| 272 | 3.6772 | 0.0059 |
| 273 | 3.6831 | 0.0059 |
| 274 | 3.6889 | 0.0059 |
| 275 | 3.6948 | 0.0059 |
| 276 | 3.7007 | 0.0059 |
| 277 | 3.7065 | 0.0058 |
| 278 | 3.7123 | 0.0058 |
| 279 | 3.7181 | 0.0058 |
| 280 | 3.7239 | 0.0058 |
| 281 | 3.7297 | 0.0058 |
| 282 | 3.7355 | 0.0058 |
| 283 | 3.7413 | 0.0058 |
| 284 | 3.7470 | 0.0058 |
| 285 | 3.7528 | 0.0057 |
| 286 | 3.7585 | 0.0057 |
| 287 | 3.7643 | 0.0057 |
| 288 | 3.7700 | 0.0057 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0057 | 0.0008 | 0.0049 |
| 2 | 0.0057 | 0.0008 | 0.0049 |
| 3 | 0.0057 | 0.0008 | 0.0049 |
| 4 | 0.0058 | 0.0008 | 0.0049 |
| 5 | 0.0058 | 0.0009 | 0.0049 |
| 6 | 0.0058 | 0.0009 | 0.0049 |
| 7 | 0.0058 | 0.0009 | 0.0050 |
| 8 | 0.0058 | 0.0009 | 0.0050 |
| 9 | 0.0059 | 0.0009 | 0.0050 |
| 10 | 0.0059 | 0.0009 | 0.0050 |
| 11 | 0.0059 | 0.0009 | 0.0050 |
| 12 | 0.0059 | 0.0009 | 0.0050 |
| 13 | 0.0059 | 0.0009 | 0.0051 |
| 14 | 0.0059 | 0.0009 | 0.0051 |
| 15 | 0.0060 | 0.0009 | 0.0051 |
| 16 | 0.0060 | 0.0009 | 0.0051 |
| 17 | 0.0060 | 0.0009 | 0.0051 |
| 18 | 0.0060 | 0.0009 | 0.0051 |

| | | | |
|---|---|---|---|
| 19 | 0.0060 | 0.0009 | 0.0052 |
| 20 | 0.0061 | 0.0009 | 0.0052 |
| 21 | 0.0061 | 0.0009 | 0.0052 |
| 22 | 0.0061 | 0.0009 | 0.0052 |
| 23 | 0.0061 | 0.0009 | 0.0052 |
| 24 | 0.0061 | 0.0009 | 0.0052 |
| 25 | 0.0062 | 0.0009 | 0.0053 |
| 26 | 0.0062 | 0.0009 | 0.0053 |
| 27 | 0.0062 | 0.0009 | 0.0053 |
| 28 | 0.0062 | 0.0009 | 0.0053 |
| 29 | 0.0062 | 0.0009 | 0.0053 |
| 30 | 0.0063 | 0.0009 | 0.0053 |
| 31 | 0.0063 | 0.0009 | 0.0054 |
| 32 | 0.0063 | 0.0009 | 0.0054 |
| 33 | 0.0063 | 0.0009 | 0.0054 |
| 34 | 0.0063 | 0.0009 | 0.0054 |
| 35 | 0.0064 | 0.0009 | 0.0054 |
| 36 | 0.0064 | 0.0009 | 0.0055 |
| 37 | 0.0064 | 0.0009 | 0.0055 |
| 38 | 0.0064 | 0.0009 | 0.0055 |
| 39 | 0.0065 | 0.0010 | 0.0055 |
| 40 | 0.0065 | 0.0010 | 0.0055 |
| 41 | 0.0065 | 0.0010 | 0.0056 |
| 42 | 0.0065 | 0.0010 | 0.0056 |
| 43 | 0.0066 | 0.0010 | 0.0056 |
| 44 | 0.0066 | 0.0010 | 0.0056 |
| 45 | 0.0066 | 0.0010 | 0.0056 |
| 46 | 0.0066 | 0.0010 | 0.0057 |
| 47 | 0.0067 | 0.0010 | 0.0057 |
| 48 | 0.0067 | 0.0010 | 0.0057 |
| 49 | 0.0067 | 0.0010 | 0.0057 |
| 50 | 0.0067 | 0.0010 | 0.0057 |
| 51 | 0.0068 | 0.0010 | 0.0058 |
| 52 | 0.0068 | 0.0010 | 0.0058 |
| 53 | 0.0068 | 0.0010 | 0.0058 |
| 54 | 0.0068 | 0.0010 | 0.0058 |
| 55 | 0.0069 | 0.0010 | 0.0059 |
| 56 | 0.0069 | 0.0010 | 0.0059 |
| 57 | 0.0069 | 0.0010 | 0.0059 |
| 58 | 0.0070 | 0.0010 | 0.0059 |
| 59 | 0.0070 | 0.0010 | 0.0060 |
| 60 | 0.0070 | 0.0010 | 0.0060 |
| 61 | 0.0071 | 0.0010 | 0.0060 |
| 62 | 0.0071 | 0.0010 | 0.0060 |
| 63 | 0.0071 | 0.0010 | 0.0061 |
| 64 | 0.0071 | 0.0011 | 0.0061 |
| 65 | 0.0072 | 0.0011 | 0.0061 |
| 66 | 0.0072 | 0.0011 | 0.0061 |
| 67 | 0.0072 | 0.0011 | 0.0062 |
| 68 | 0.0073 | 0.0011 | 0.0062 |
| 69 | 0.0073 | 0.0011 | 0.0062 |
| 70 | 0.0073 | 0.0011 | 0.0063 |
| 71 | 0.0074 | 0.0011 | 0.0063 |
| 72 | 0.0074 | 0.0011 | 0.0063 |
| 73 | 0.0075 | 0.0011 | 0.0064 |
| 74 | 0.0075 | 0.0011 | 0.0064 |
| 75 | 0.0075 | 0.0011 | 0.0064 |
| 76 | 0.0075 | 0.0011 | 0.0064 |
| 77 | 0.0076 | 0.0011 | 0.0065 |
| 78 | 0.0076 | 0.0011 | 0.0065 |
| 79 | 0.0077 | 0.0011 | 0.0065 |
| 80 | 0.0077 | 0.0011 | 0.0066 |
| 81 | 0.0077 | 0.0011 | 0.0066 |
| 82 | 0.0078 | 0.0011 | 0.0066 |
| 83 | 0.0078 | 0.0012 | 0.0067 |
| 84 | 0.0079 | 0.0012 | 0.0067 |
| 85 | 0.0079 | 0.0012 | 0.0067 |
| 86 | 0.0079 | 0.0012 | 0.0068 |
| 87 | 0.0080 | 0.0012 | 0.0068 |
| 88 | 0.0080 | 0.0012 | 0.0068 |
| 89 | 0.0081 | 0.0012 | 0.0069 |

| | | | |
|---|---|---|---|
| 90 | 0.0081 | 0.0012 | 0.0069 |
| 91 | 0.0082 | 0.0012 | 0.0070 |
| 92 | 0.0082 | 0.0012 | 0.0070 |
| 93 | 0.0083 | 0.0012 | 0.0070 |
| 94 | 0.0083 | 0.0012 | 0.0071 |
| 95 | 0.0084 | 0.0012 | 0.0071 |
| 96 | 0.0084 | 0.0012 | 0.0072 |
| 97 | 0.0085 | 0.0012 | 0.0072 |
| 98 | 0.0085 | 0.0012 | 0.0072 |
| 99 | 0.0086 | 0.0013 | 0.0073 |
| 100 | 0.0086 | 0.0013 | 0.0073 |
| 101 | 0.0087 | 0.0013 | 0.0074 |
| 102 | 0.0087 | 0.0013 | 0.0074 |
| 103 | 0.0088 | 0.0013 | 0.0075 |
| 104 | 0.0088 | 0.0013 | 0.0075 |
| 105 | 0.0089 | 0.0013 | 0.0076 |
| 106 | 0.0089 | 0.0013 | 0.0076 |
| 107 | 0.0090 | 0.0013 | 0.0077 |
| 108 | 0.0090 | 0.0013 | 0.0077 |
| 109 | 0.0091 | 0.0013 | 0.0078 |
| 110 | 0.0092 | 0.0013 | 0.0078 |
| 111 | 0.0092 | 0.0014 | 0.0079 |
| 112 | 0.0093 | 0.0014 | 0.0079 |
| 113 | 0.0094 | 0.0014 | 0.0080 |
| 114 | 0.0094 | 0.0014 | 0.0080 |
| 115 | 0.0095 | 0.0014 | 0.0081 |
| 116 | 0.0096 | 0.0014 | 0.0081 |
| 117 | 0.0096 | 0.0014 | 0.0082 |
| 118 | 0.0097 | 0.0014 | 0.0083 |
| 119 | 0.0098 | 0.0014 | 0.0084 |
| 120 | 0.0098 | 0.0014 | 0.0084 |
| 121 | 0.0099 | 0.0015 | 0.0085 |
| 122 | 0.0100 | 0.0015 | 0.0085 |
| 123 | 0.0101 | 0.0015 | 0.0086 |
| 124 | 0.0102 | 0.0015 | 0.0087 |
| 125 | 0.0103 | 0.0015 | 0.0088 |
| 126 | 0.0103 | 0.0015 | 0.0088 |
| 127 | 0.0105 | 0.0015 | 0.0089 |
| 128 | 0.0105 | 0.0015 | 0.0090 |
| 129 | 0.0106 | 0.0016 | 0.0091 |
| 130 | 0.0107 | 0.0016 | 0.0091 |
| 131 | 0.0108 | 0.0016 | 0.0092 |
| 132 | 0.0109 | 0.0016 | 0.0093 |
| 133 | 0.0110 | 0.0016 | 0.0094 |
| 134 | 0.0111 | 0.0016 | 0.0095 |
| 135 | 0.0112 | 0.0017 | 0.0096 |
| 136 | 0.0113 | 0.0017 | 0.0097 |
| 137 | 0.0115 | 0.0017 | 0.0098 |
| 138 | 0.0116 | 0.0017 | 0.0099 |
| 139 | 0.0117 | 0.0017 | 0.0100 |
| 140 | 0.0118 | 0.0017 | 0.0101 |
| 141 | 0.0120 | 0.0018 | 0.0102 |
| 142 | 0.0121 | 0.0018 | 0.0103 |
| 143 | 0.0122 | 0.0018 | 0.0104 |
| 144 | 0.0123 | 0.0018 | 0.0105 |
| 145 | 0.0149 | 0.0022 | 0.0127 |
| 146 | 0.0150 | 0.0022 | 0.0128 |
| 147 | 0.0152 | 0.0022 | 0.0129 |
| 148 | 0.0153 | 0.0022 | 0.0130 |
| 149 | 0.0155 | 0.0023 | 0.0132 |
| 150 | 0.0156 | 0.0023 | 0.0133 |
| 151 | 0.0159 | 0.0023 | 0.0135 |
| 152 | 0.0160 | 0.0024 | 0.0136 |
| 153 | 0.0162 | 0.0024 | 0.0138 |
| 154 | 0.0164 | 0.0024 | 0.0140 |
| 155 | 0.0166 | 0.0024 | 0.0142 |
| 156 | 0.0168 | 0.0025 | 0.0143 |
| 157 | 0.0171 | 0.0025 | 0.0146 |
| 158 | 0.0172 | 0.0025 | 0.0147 |
| 159 | 0.0176 | 0.0026 | 0.0150 |
| 160 | 0.0177 | 0.0026 | 0.0151 |

| | | | |
|---|---|---|---|
| 161 | 0.0181 | 0.0027 | 0.0154 |
| 162 | 0.0183 | 0.0027 | 0.0156 |
| 163 | 0.0187 | 0.0027 | 0.0159 |
| 164 | 0.0189 | 0.0028 | 0.0161 |
| 165 | 0.0193 | 0.0028 | 0.0165 |
| 166 | 0.0195 | 0.0029 | 0.0167 |
| 167 | 0.0200 | 0.0029 | 0.0171 |
| 168 | 0.0203 | 0.0030 | 0.0173 |
| 169 | 0.0208 | 0.0031 | 0.0178 |
| 170 | 0.0211 | 0.0031 | 0.0180 |
| 171 | 0.0217 | 0.0032 | 0.0185 |
| 172 | 0.0221 | 0.0032 | 0.0188 |
| 173 | 0.0228 | 0.0034 | 0.0194 |
| 174 | 0.0232 | 0.0034 | 0.0198 |
| 175 | 0.0240 | 0.0035 | 0.0205 |
| 176 | 0.0244 | 0.0036 | 0.0208 |
| 177 | 0.0254 | 0.0037 | 0.0217 |
| 178 | 0.0260 | 0.0038 | 0.0221 |
| 179 | 0.0272 | 0.0040 | 0.0232 |
| 180 | 0.0278 | 0.0041 | 0.0237 |
| 181 | 0.0293 | 0.0043 | 0.0250 |
| 182 | 0.0302 | 0.0044 | 0.0257 |
| 183 | 0.0321 | 0.0047 | 0.0274 |
| 184 | 0.0332 | 0.0049 | 0.0283 |
| 185 | 0.0279 | 0.0041 | 0.0238 |
| 186 | 0.0294 | 0.0043 | 0.0251 |
| 187 | 0.0334 | 0.0049 | 0.0285 |
| 188 | 0.0360 | 0.0053 | 0.0307 |
| 189 | 0.0434 | 0.0064 | 0.0370 |
| 190 | 0.0490 | 0.0065 | 0.0425 |
| 191 | 0.0701 | 0.0065 | 0.0635 |
| 192 | 0.0963 | 0.0065 | 0.0898 |
| 193 | 0.3015 | 0.0065 | 0.2950 |
| 194 | 0.0571 | 0.0065 | 0.0505 |
| 195 | 0.0393 | 0.0058 | 0.0335 |
| 196 | 0.0313 | 0.0046 | 0.0267 |
| 197 | 0.0345 | 0.0051 | 0.0294 |
| 198 | 0.0311 | 0.0046 | 0.0265 |
| 199 | 0.0285 | 0.0042 | 0.0243 |
| 200 | 0.0265 | 0.0039 | 0.0226 |
| 201 | 0.0249 | 0.0037 | 0.0213 |
| 202 | 0.0236 | 0.0035 | 0.0201 |
| 203 | 0.0224 | 0.0033 | 0.0191 |
| 204 | 0.0214 | 0.0032 | 0.0183 |
| 205 | 0.0206 | 0.0030 | 0.0175 |
| 206 | 0.0198 | 0.0029 | 0.0169 |
| 207 | 0.0191 | 0.0028 | 0.0163 |
| 208 | 0.0185 | 0.0027 | 0.0158 |
| 209 | 0.0179 | 0.0026 | 0.0153 |
| 210 | 0.0174 | 0.0026 | 0.0148 |
| 211 | 0.0169 | 0.0025 | 0.0144 |
| 212 | 0.0165 | 0.0024 | 0.0141 |
| 213 | 0.0161 | 0.0024 | 0.0137 |
| 214 | 0.0157 | 0.0023 | 0.0134 |
| 215 | 0.0154 | 0.0023 | 0.0131 |
| 216 | 0.0151 | 0.0022 | 0.0128 |
| 217 | 0.0124 | 0.0018 | 0.0106 |
| 218 | 0.0121 | 0.0018 | 0.0104 |
| 219 | 0.0119 | 0.0017 | 0.0101 |
| 220 | 0.0116 | 0.0017 | 0.0099 |
| 221 | 0.0114 | 0.0017 | 0.0097 |
| 222 | 0.0112 | 0.0016 | 0.0095 |
| 223 | 0.0110 | 0.0016 | 0.0094 |
| 224 | 0.0108 | 0.0016 | 0.0092 |
| 225 | 0.0106 | 0.0016 | 0.0090 |
| 226 | 0.0104 | 0.0015 | 0.0089 |
| 227 | 0.0102 | 0.0015 | 0.0087 |
| 228 | 0.0101 | 0.0015 | 0.0086 |
| 229 | 0.0099 | 0.0015 | 0.0084 |
| 230 | 0.0097 | 0.0014 | 0.0083 |
| 231 | 0.0096 | 0.0014 | 0.0082 |

| | | | |
|---|---|---|---|
| 232 | 0.0095 | 0.0014 | 0.0081 |
| 233 | 0.0093 | 0.0014 | 0.0080 |
| 234 | 0.0092 | 0.0014 | 0.0078 |
| 235 | 0.0091 | 0.0013 | 0.0077 |
| 236 | 0.0090 | 0.0013 | 0.0076 |
| 237 | 0.0088 | 0.0013 | 0.0075 |
| 238 | 0.0087 | 0.0013 | 0.0074 |
| 239 | 0.0086 | 0.0013 | 0.0074 |
| 240 | 0.0085 | 0.0013 | 0.0073 |
| 241 | 0.0084 | 0.0012 | 0.0072 |
| 242 | 0.0083 | 0.0012 | 0.0071 |
| 243 | 0.0082 | 0.0012 | 0.0070 |
| 244 | 0.0081 | 0.0012 | 0.0069 |
| 245 | 0.0081 | 0.0012 | 0.0069 |
| 246 | 0.0080 | 0.0012 | 0.0068 |
| 247 | 0.0079 | 0.0012 | 0.0067 |
| 248 | 0.0078 | 0.0011 | 0.0067 |
| 249 | 0.0077 | 0.0011 | 0.0066 |
| 250 | 0.0076 | 0.0011 | 0.0065 |
| 251 | 0.0076 | 0.0011 | 0.0065 |
| 252 | 0.0075 | 0.0011 | 0.0064 |
| 253 | 0.0074 | 0.0011 | 0.0063 |
| 254 | 0.0074 | 0.0011 | 0.0063 |
| 255 | 0.0073 | 0.0011 | 0.0062 |
| 256 | 0.0072 | 0.0011 | 0.0062 |
| 257 | 0.0072 | 0.0011 | 0.0061 |
| 258 | 0.0071 | 0.0010 | 0.0061 |
| 259 | 0.0070 | 0.0010 | 0.0060 |
| 260 | 0.0070 | 0.0010 | 0.0060 |
| 261 | 0.0069 | 0.0010 | 0.0059 |
| 262 | 0.0069 | 0.0010 | 0.0059 |
| 263 | 0.0068 | 0.0010 | 0.0058 |
| 264 | 0.0068 | 0.0010 | 0.0058 |
| 265 | 0.0067 | 0.0010 | 0.0057 |
| 266 | 0.0067 | 0.0010 | 0.0057 |
| 267 | 0.0066 | 0.0010 | 0.0056 |
| 268 | 0.0066 | 0.0010 | 0.0056 |
| 269 | 0.0065 | 0.0010 | 0.0055 |
| 270 | 0.0065 | 0.0009 | 0.0055 |
| 271 | 0.0064 | 0.0009 | 0.0055 |
| 272 | 0.0064 | 0.0009 | 0.0054 |
| 273 | 0.0063 | 0.0009 | 0.0054 |
| 274 | 0.0063 | 0.0009 | 0.0054 |
| 275 | 0.0062 | 0.0009 | 0.0053 |
| 276 | 0.0062 | 0.0009 | 0.0053 |
| 277 | 0.0061 | 0.0009 | 0.0052 |
| 278 | 0.0061 | 0.0009 | 0.0052 |
| 279 | 0.0061 | 0.0009 | 0.0052 |
| 280 | 0.0060 | 0.0009 | 0.0051 |
| 281 | 0.0060 | 0.0009 | 0.0051 |
| 282 | 0.0059 | 0.0009 | 0.0051 |
| 283 | 0.0059 | 0.0009 | 0.0050 |
| 284 | 0.0059 | 0.0009 | 0.0050 |
| 285 | 0.0058 | 0.0009 | 0.0050 |
| 286 | 0.0058 | 0.0009 | 0.0050 |
| 287 | 0.0058 | 0.0008 | 0.0049 |
| 288 | 0.0057 | 0.0008 | 0.0049 |

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Total soil rain loss = 0.50(In)
Total effective rainfall = 3.27(In)
Peak flow rate in flood hydrograph = 14.60(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

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Hydrograph in 5 Minute intervals ((CFS))

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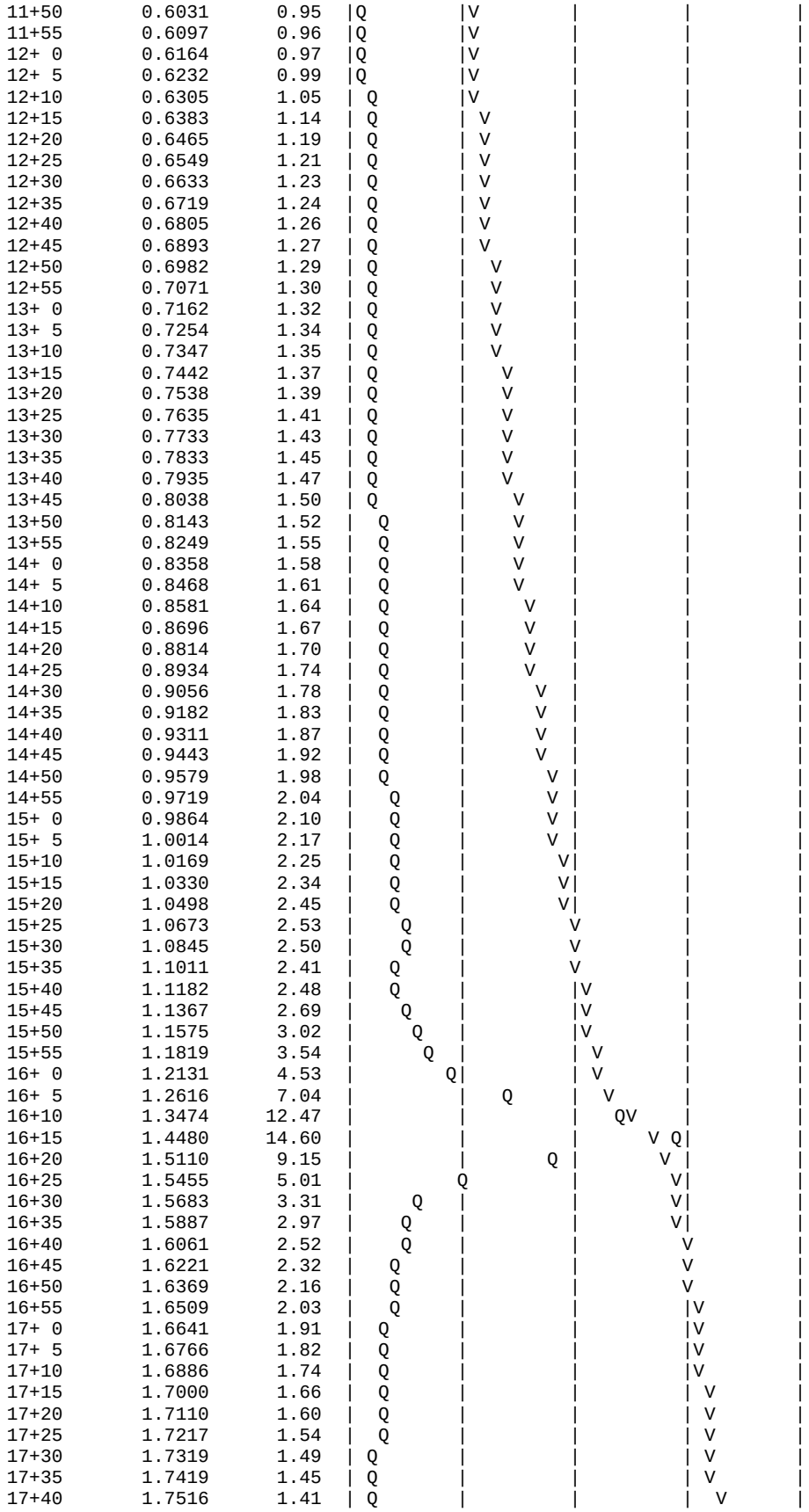
Time(h+m) Volume Ac.Ft Q(CFS) 0 5.0 10.0 15.0 20.0

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0002 | 0.02 | Q | | | | |
| 0+10 | 0.0011 | 0.14 | Q | | | | |
| 0+15 | 0.0034 | 0.33 | Q | | | | |
| 0+20 | 0.0063 | 0.42 | Q | | | | |
| 0+25 | 0.0094 | 0.45 | Q | | | | |
| 0+30 | 0.0125 | 0.46 | Q | | | | |
| 0+35 | 0.0157 | 0.46 | Q | | | | |
| 0+40 | 0.0189 | 0.47 | Q | | | | |
| 0+45 | 0.0221 | 0.47 | Q | | | | |
| 0+50 | 0.0254 | 0.47 | Q | | | | |
| 0+55 | 0.0286 | 0.47 | Q | | | | |
| 1+ 0 | 0.0319 | 0.47 | Q | | | | |
| 1+ 5 | 0.0351 | 0.47 | Q | | | | |
| 1+10 | 0.0384 | 0.47 | Q | | | | |
| 1+15 | 0.0417 | 0.48 | Q | | | | |
| 1+20 | 0.0450 | 0.48 | Q | | | | |
| 1+25 | 0.0483 | 0.48 | Q | | | | |
| 1+30 | 0.0516 | 0.48 | Q | | | | |
| 1+35 | 0.0549 | 0.48 | QV | | | | |
| 1+40 | 0.0582 | 0.48 | QV | | | | |
| 1+45 | 0.0616 | 0.49 | QV | | | | |
| 1+50 | 0.0649 | 0.49 | QV | | | | |
| 1+55 | 0.0683 | 0.49 | QV | | | | |
| 2+ 0 | 0.0717 | 0.49 | QV | | | | |
| 2+ 5 | 0.0751 | 0.49 | QV | | | | |
| 2+10 | 0.0785 | 0.49 | QV | | | | |
| 2+15 | 0.0819 | 0.50 | QV | | | | |
| 2+20 | 0.0853 | 0.50 | QV | | | | |
| 2+25 | 0.0887 | 0.50 | QV | | | | |
| 2+30 | 0.0922 | 0.50 | \|Q | | | | |
| 2+35 | 0.0956 | 0.50 | \|Q | | | | |
| 2+40 | 0.0991 | 0.50 | \|Q | | | | |
| 2+45 | 0.1026 | 0.51 | \|Q | | | | |
| 2+50 | 0.1061 | 0.51 | \|Q | | | | |
| 2+55 | 0.1096 | 0.51 | \|QV | | | | |
| 3+ 0 | 0.1131 | 0.51 | \|QV | | | | |
| 3+ 5 | 0.1166 | 0.51 | \|QV | | | | |
| 3+10 | 0.1202 | 0.51 | \|QV | | | | |
| 3+15 | 0.1237 | 0.52 | \|QV | | | | |
| 3+20 | 0.1273 | 0.52 | \|QV | | | | |
| 3+25 | 0.1309 | 0.52 | \|QV | | | | |
| 3+30 | 0.1345 | 0.52 | \|QV | | | | |
| 3+35 | 0.1381 | 0.52 | \|QV | | | | |
| 3+40 | 0.1417 | 0.53 | \|QV | | | | |
| 3+45 | 0.1453 | 0.53 | \|QV | | | | |
| 3+50 | 0.1490 | 0.53 | \|QV | | | | |
| 3+55 | 0.1527 | 0.53 | \|QV | | | | |
| 4+ 0 | 0.1563 | 0.53 | \|QV | | | | |
| 4+ 5 | 0.1600 | 0.54 | \|Q V | | | | |
| 4+10 | 0.1637 | 0.54 | \|Q V | | | | |
| 4+15 | 0.1675 | 0.54 | \|Q V | | | | |
| 4+20 | 0.1712 | 0.54 | \|Q V | | | | |
| 4+25 | 0.1749 | 0.54 | \|Q V | | | | |
| 4+30 | 0.1787 | 0.55 | \|Q V | | | | |
| 4+35 | 0.1825 | 0.55 | \|Q V | | | | |
| 4+40 | 0.1863 | 0.55 | \|Q V | | | | |
| 4+45 | 0.1901 | 0.55 | \|Q V | | | | |
| 4+50 | 0.1939 | 0.56 | \|Q V | | | | |
| 4+55 | 0.1978 | 0.56 | \|Q V | | | | |
| 5+ 0 | 0.2016 | 0.56 | \|Q V | | | | |
| 5+ 5 | 0.2055 | 0.56 | \|Q V | | | | |
| 5+10 | 0.2094 | 0.57 | \|Q V | | | | |
| 5+15 | 0.2133 | 0.57 | \|Q  V | | | | |
| 5+20 | 0.2172 | 0.57 | \|Q  V | | | | |
| 5+25 | 0.2212 | 0.57 | \|Q  V | | | | |
| 5+30 | 0.2251 | 0.57 | \|Q  V | | | | |
| 5+35 | 0.2291 | 0.58 | \|Q  V | | | | |
| 5+40 | 0.2331 | 0.58 | \|Q  V | | | | |
| 5+45 | 0.2371 | 0.58 | \|Q  V | | | | |
| 5+50 | 0.2411 | 0.59 | \|Q  V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5+55 | 0.2452 | 0.59 | \|Q V \| | \| | \| | \| |
| 6+ 0 | 0.2493 | 0.59 | \|Q V \| | \| | \| | \| |
| 6+ 5 | 0.2533 | 0.59 | \|Q V \| | \| | \| | \| |
| 6+10 | 0.2574 | 0.60 | \|Q V \| | \| | \| | \| |
| 6+15 | 0.2616 | 0.60 | \|Q V \| | \| | \| | \| |
| 6+20 | 0.2657 | 0.60 | \|Q V \| | \| | \| | \| |
| 6+25 | 0.2699 | 0.60 | \|Q V \| | \| | \| | \| |
| 6+30 | 0.2741 | 0.61 | \|Q V \| | \| | \| | \| |
| 6+35 | 0.2783 | 0.61 | \|Q V \| | \| | \| | \| |
| 6+40 | 0.2825 | 0.61 | \|Q V \| | \| | \| | \| |
| 6+45 | 0.2867 | 0.62 | \|Q V \| | \| | \| | \| |
| 6+50 | 0.2910 | 0.62 | \|Q V \| | \| | \| | \| |
| 6+55 | 0.2953 | 0.62 | \|Q V \| | \| | \| | \| |
| 7+ 0 | 0.2996 | 0.63 | \|Q V \| | \| | \| | \| |
| 7+ 5 | 0.3039 | 0.63 | \|Q V \| | \| | \| | \| |
| 7+10 | 0.3083 | 0.63 | \|Q V \| | \| | \| | \| |
| 7+15 | 0.3127 | 0.64 | \|Q V \| | \| | \| | \| |
| 7+20 | 0.3171 | 0.64 | \|Q V \| | \| | \| | \| |
| 7+25 | 0.3215 | 0.64 | \|Q V \| | \| | \| | \| |
| 7+30 | 0.3259 | 0.65 | \|Q V \| | \| | \| | \| |
| 7+35 | 0.3304 | 0.65 | \|Q V \| | \| | \| | \| |
| 7+40 | 0.3349 | 0.65 | \|Q V \| | \| | \| | \| |
| 7+45 | 0.3394 | 0.66 | \|Q V \| | \| | \| | \| |
| 7+50 | 0.3440 | 0.66 | \|Q V \| | \| | \| | \| |
| 7+55 | 0.3485 | 0.66 | \|Q V \| | \| | \| | \| |
| 8+ 0 | 0.3531 | 0.67 | \|Q V \| | \| | \| | \| |
| 8+ 5 | 0.3578 | 0.67 | \|Q V \| | \| | \| | \| |
| 8+10 | 0.3624 | 0.68 | \|Q V \| | \| | \| | \| |
| 8+15 | 0.3671 | 0.68 | \|Q V \| | \| | \| | \| |
| 8+20 | 0.3718 | 0.68 | \|Q V \| | \| | \| | \| |
| 8+25 | 0.3765 | 0.69 | \|Q V \| | \| | \| | \| |
| 8+30 | 0.3813 | 0.69 | \|Q V \| | \| | \| | \| |
| 8+35 | 0.3861 | 0.70 | \|Q V \| | \| | \| | \| |
| 8+40 | 0.3909 | 0.70 | \|Q V \| | \| | \| | \| |
| 8+45 | 0.3957 | 0.70 | \|Q V \| | \| | \| | \| |
| 8+50 | 0.4006 | 0.71 | \|Q V \| | \| | \| | \| |
| 8+55 | 0.4055 | 0.71 | \|Q V \| | \| | \| | \| |
| 9+ 0 | 0.4105 | 0.72 | \|Q V \| | \| | \| | \| |
| 9+ 5 | 0.4155 | 0.72 | \|Q V \| | \| | \| | \| |
| 9+10 | 0.4205 | 0.73 | \|Q V \| | \| | \| | \| |
| 9+15 | 0.4255 | 0.73 | \|Q V \| | \| | \| | \| |
| 9+20 | 0.4306 | 0.74 | \|Q V \| | \| | \| | \| |
| 9+25 | 0.4357 | 0.74 | \|Q V \| | \| | \| | \| |
| 9+30 | 0.4409 | 0.75 | \|Q V \| | \| | \| | \| |
| 9+35 | 0.4461 | 0.75 | \|Q V \| | \| | \| | \| |
| 9+40 | 0.4513 | 0.76 | \|Q V \| | \| | \| | \| |
| 9+45 | 0.4565 | 0.76 | \|Q V \| | \| | \| | \| |
| 9+50 | 0.4618 | 0.77 | \|Q V \| | \| | \| | \| |
| 9+55 | 0.4672 | 0.78 | \|Q V \| | \| | \| | \| |
| 10+ 0 | 0.4725 | 0.78 | \|Q V \| | \| | \| | \| |
| 10+ 5 | 0.4780 | 0.79 | \|Q V\| | \| | \| | \| |
| 10+10 | 0.4834 | 0.79 | \|Q V\| | \| | \| | \| |
| 10+15 | 0.4889 | 0.80 | \|Q V\| | \| | \| | \| |
| 10+20 | 0.4945 | 0.81 | \|Q V\| | \| | \| | \| |
| 10+25 | 0.5001 | 0.81 | \|Q V\| | \| | \| | \| |
| 10+30 | 0.5057 | 0.82 | \|Q V\| | \| | \| | \| |
| 10+35 | 0.5114 | 0.83 | \|Q V\| | \| | \| | \| |
| 10+40 | 0.5171 | 0.83 | \|Q V\| | \| | \| | \| |
| 10+45 | 0.5229 | 0.84 | \|Q V\| | \| | \| | \| |
| 10+50 | 0.5287 | 0.85 | \|Q V\| | \| | \| | \| |
| 10+55 | 0.5346 | 0.85 | \|Q V \| | \| | \| | \| |
| 11+ 0 | 0.5405 | 0.86 | \|Q V \| | \| | \| | \| |
| 11+ 5 | 0.5465 | 0.87 | \|Q V \| | \| | \| | \| |
| 11+10 | 0.5526 | 0.88 | \|Q V \| | \| | \| | \| |
| 11+15 | 0.5587 | 0.89 | \|Q V \| | \| | \| | \| |
| 11+20 | 0.5648 | 0.89 | \|Q V \| | \| | \| | \| |
| 11+25 | 0.5711 | 0.90 | \|Q V \| | \| | \| | \| |
| 11+30 | 0.5773 | 0.91 | \|Q V \| | \| | \| | \| |
| 11+35 | 0.5837 | 0.92 | \|Q \|V \| | \| | \| | \| |
| 11+40 | 0.5901 | 0.93 | \|Q \|V \| | \| | \| | \| |
| 11+45 | 0.5966 | 0.94 | \|Q \|V \| | \| | \| | \| |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17+45 | 1.7610 | 1.37 | Q | | | | V |
| 17+50 | 1.7702 | 1.33 | Q | | | | V |
| 17+55 | 1.7791 | 1.30 | Q | | | | V |
| 18+ 0 | 1.7878 | 1.27 | Q | | | | V |
| 18+ 5 | 1.7963 | 1.23 | Q | | | | V |
| 18+10 | 1.8043 | 1.16 | Q | | | | V |
| 18+15 | 1.8116 | 1.06 | Q | | | | V |
| 18+20 | 1.8184 | 1.00 | Q | | | | V |
| 18+25 | 1.8251 | 0.96 | Q | | | | V |
| 18+30 | 1.8315 | 0.94 | Q | | | | V |
| 18+35 | 1.8379 | 0.92 | Q | | | | V |
| 18+40 | 1.8441 | 0.90 | Q | | | | V |
| 18+45 | 1.8502 | 0.88 | Q | | | | V |
| 18+50 | 1.8561 | 0.87 | Q | | | | V |
| 18+55 | 1.8620 | 0.85 | Q | | | | V |
| 19+ 0 | 1.8678 | 0.84 | Q | | | | V |
| 19+ 5 | 1.8734 | 0.82 | Q | | | | V |
| 19+10 | 1.8790 | 0.81 | Q | | | | V |
| 19+15 | 1.8845 | 0.80 | Q | | | | V |
| 19+20 | 1.8899 | 0.79 | Q | | | | V |
| 19+25 | 1.8952 | 0.77 | Q | | | | V |
| 19+30 | 1.9005 | 0.76 | Q | | | | V |
| 19+35 | 1.9057 | 0.75 | Q | | | | V |
| 19+40 | 1.9108 | 0.74 | Q | | | | V |
| 19+45 | 1.9158 | 0.73 | Q | | | | V |
| 19+50 | 1.9208 | 0.72 | Q | | | | V |
| 19+55 | 1.9257 | 0.71 | Q | | | | V |
| 20+ 0 | 1.9305 | 0.70 | Q | | | | V |
| 20+ 5 | 1.9353 | 0.69 | Q | | | | V |
| 20+10 | 1.9400 | 0.69 | Q | | | | V |
| 20+15 | 1.9447 | 0.68 | Q | | | | V |
| 20+20 | 1.9493 | 0.67 | Q | | | | V |
| 20+25 | 1.9539 | 0.66 | Q | | | | V |
| 20+30 | 1.9584 | 0.66 | Q | | | | V |
| 20+35 | 1.9629 | 0.65 | Q | | | | V |
| 20+40 | 1.9673 | 0.64 | Q | | | | V |
| 20+45 | 1.9716 | 0.63 | Q | | | | V |
| 20+50 | 1.9760 | 0.63 | Q | | | | V |
| 20+55 | 1.9803 | 0.62 | Q | | | | V |
| 21+ 0 | 1.9845 | 0.62 | Q | | | | V |
| 21+ 5 | 1.9887 | 0.61 | Q | | | | V |
| 21+10 | 1.9928 | 0.60 | Q | | | | V |
| 21+15 | 1.9970 | 0.60 | Q | | | | V |
| 21+20 | 2.0010 | 0.59 | Q | | | | V |
| 21+25 | 2.0051 | 0.59 | Q | | | | V |
| 21+30 | 2.0091 | 0.58 | Q | | | | V |
| 21+35 | 2.0131 | 0.58 | Q | | | | V |
| 21+40 | 2.0170 | 0.57 | Q | | | | V |
| 21+45 | 2.0209 | 0.57 | Q | | | | V |
| 21+50 | 2.0248 | 0.56 | Q | | | | V |
| 21+55 | 2.0286 | 0.56 | Q | | | | V |
| 22+ 0 | 2.0324 | 0.55 | Q | | | | V |
| 22+ 5 | 2.0362 | 0.55 | Q | | | | V |
| 22+10 | 2.0399 | 0.54 | Q | | | | V |
| 22+15 | 2.0437 | 0.54 | Q | | | | V |
| 22+20 | 2.0474 | 0.54 | Q | | | | V |
| 22+25 | 2.0510 | 0.53 | Q | | | | V |
| 22+30 | 2.0546 | 0.53 | Q | | | | V |
| 22+35 | 2.0582 | 0.52 | Q | | | | V |
| 22+40 | 2.0618 | 0.52 | Q | | | | V |
| 22+45 | 2.0654 | 0.52 | Q | | | | V |
| 22+50 | 2.0689 | 0.51 | Q | | | | V |
| 22+55 | 2.0724 | 0.51 | Q | | | | V |
| 23+ 0 | 2.0759 | 0.50 | Q | | | | V |
| 23+ 5 | 2.0793 | 0.50 | Q | | | | V |
| 23+10 | 2.0828 | 0.50 | Q | | | | V |
| 23+15 | 2.0862 | 0.49 | Q | | | | V |
| 23+20 | 2.0896 | 0.49 | Q | | | | V |
| 23+25 | 2.0929 | 0.49 | Q | | | | V |
| 23+30 | 2.0963 | 0.49 | Q | | | | V |
| 23+35 | 2.0996 | 0.48 | Q | | | | V |

```
   23+40       2.1029      0.48  Q         |         |         |        V|
   23+45       2.1062      0.48  Q         |         |         |        V|
   23+50       2.1094      0.47  Q         |         |         |        V|
   23+55       2.1127      0.47  Q         |         |         |        V|
   24+ 0       2.1159      0.47  Q         |         |         |        V|
   24+ 5       2.1189      0.44  Q         |         |         |        V|
   24+10       2.1211      0.32  Q         |         |         |        V|
   24+15       2.1221      0.14  Q         |         |         |        V|
   24+20       2.1223      0.04  Q         |         |         |        V|
   24+25       2.1224      0.01  Q         |         |         |        V|
   24+30       2.1225      0.01  Q         |         |         |         V
-------------------------------------------------------------------------
```

# Unit Hydrograph Analysis: Developed Condition (5 yr, 24 hr Storm Event)

```
       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  07/01/23

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


Program License Serial Number 6484

------------------------------------------------------------------------
UH ANALYSIS
DEVELOPED CONDITION
5-YR STORM EVENT

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

       Storm Event Year = 5

       Antecedent Moisture Condition = 3

 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        Duration        Isohyetal
       (Ac.)            (hours)         (In)
Rainfall data for year 5
            7.80            1           0.68
------------------------------------------------------------------------
Rainfall data for year 5
            7.80            6           1.75
------------------------------------------------------------------------
Rainfall data for year 5
            7.80           24           3.19
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

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


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      52.0          7.80      1.000     0.785    0.100    0.079

Area-averaged adjusted loss rate Fm (In/Hr) =  0.079

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
     0.78   0.100         32.0      52.0       9.23     0.054
     7.02   0.900         98.0      98.0       0.20     0.927

Area-averaged catchment yield fraction, Y =  0.840
Area-averaged low loss fraction, Yb =  0.160
Direct entry of lag time by user
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Watershed area = 7.80(Ac.)
Catchment Lag time = 0.163 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 51.0621
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.160 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.252(In)
Computed peak 30-minute rainfall = 0.516(In)
Specified peak 1-hour rainfall = 0.681(In)
Computed peak 3-hour rainfall = 1.215(In)
Specified peak 6-hour rainfall = 1.750(In)
Specified peak 24-hour rainfall = 3.190(In)

Rainfall depth area reduction factors:
Using a total area of 7.80(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.252(In)
30-minute factor = 1.000 Adjusted rainfall = 0.516(In)
1-hour factor = 1.000 Adjusted rainfall = 0.681(In)
3-hour factor = 1.000 Adjusted rainfall = 1.215(In)
6-hour factor = 1.000 Adjusted rainfall = 1.750(In)
24-hour factor = 1.000 Adjusted rainfall = 3.190(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 = 94.33 (CFS)) | |
| 1 | 4.765 | 4.495 |
| 2 | 31.011 | 24.758 |
| 3 | 70.445 | 37.199 |
| 4 | 90.778 | 19.181 |
| 5 | 97.317 | 6.168 |
| 6 | 98.855 | 1.451 |
| 7 | 100.000 | 1.080 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.2520 | 0.2520 |
| 2 | 0.3325 | 0.0805 |
| 3 | 0.3910 | 0.0585 |
| 4 | 0.4387 | 0.0477 |
| 5 | 0.4796 | 0.0410 |
| 6 | 0.5159 | 0.0363 |
| 7 | 0.5487 | 0.0328 |
| 8 | 0.5788 | 0.0301 |
| 9 | 0.6068 | 0.0279 |
| 10 | 0.6329 | 0.0261 |
| 11 | 0.6575 | 0.0246 |
| 12 | 0.6808 | 0.0233 |
| 13 | 0.7101 | 0.0293 |
| 14 | 0.7384 | 0.0283 |
| 15 | 0.7657 | 0.0273 |
| 16 | 0.7922 | 0.0265 |
| 17 | 0.8179 | 0.0257 |
| 18 | 0.8429 | 0.0250 |
| 19 | 0.8673 | 0.0244 |
| 20 | 0.8911 | 0.0238 |
| 21 | 0.9143 | 0.0232 |
| 22 | 0.9370 | 0.0227 |
| 23 | 0.9592 | 0.0222 |
| 24 | 0.9809 | 0.0218 |
| 25 | 1.0023 | 0.0213 |
| 26 | 1.0232 | 0.0209 |
| 27 | 1.0438 | 0.0206 |

| | | |
|---|---|---|
| 28 | 1.0640 | 0.0202 |
| 29 | 1.0838 | 0.0199 |
| 30 | 1.1034 | 0.0195 |
| 31 | 1.1226 | 0.0192 |
| 32 | 1.1415 | 0.0189 |
| 33 | 1.1602 | 0.0187 |
| 34 | 1.1786 | 0.0184 |
| 35 | 1.1967 | 0.0181 |
| 36 | 1.2146 | 0.0179 |
| 37 | 1.2323 | 0.0177 |
| 38 | 1.2497 | 0.0174 |
| 39 | 1.2670 | 0.0172 |
| 40 | 1.2840 | 0.0170 |
| 41 | 1.3008 | 0.0168 |
| 42 | 1.3174 | 0.0166 |
| 43 | 1.3338 | 0.0164 |
| 44 | 1.3501 | 0.0163 |
| 45 | 1.3662 | 0.0161 |
| 46 | 1.3821 | 0.0159 |
| 47 | 1.3978 | 0.0157 |
| 48 | 1.4134 | 0.0156 |
| 49 | 1.4288 | 0.0154 |
| 50 | 1.4441 | 0.0153 |
| 51 | 1.4593 | 0.0151 |
| 52 | 1.4743 | 0.0150 |
| 53 | 1.4891 | 0.0149 |
| 54 | 1.5039 | 0.0147 |
| 55 | 1.5185 | 0.0146 |
| 56 | 1.5330 | 0.0145 |
| 57 | 1.5473 | 0.0144 |
| 58 | 1.5616 | 0.0142 |
| 59 | 1.5757 | 0.0141 |
| 60 | 1.5897 | 0.0140 |
| 61 | 1.6036 | 0.0139 |
| 62 | 1.6174 | 0.0138 |
| 63 | 1.6311 | 0.0137 |
| 64 | 1.6447 | 0.0136 |
| 65 | 1.6582 | 0.0135 |
| 66 | 1.6716 | 0.0134 |
| 67 | 1.6849 | 0.0133 |
| 68 | 1.6981 | 0.0132 |
| 69 | 1.7112 | 0.0131 |
| 70 | 1.7242 | 0.0130 |
| 71 | 1.7371 | 0.0129 |
| 72 | 1.7500 | 0.0128 |
| 73 | 1.7604 | 0.0105 |
| 74 | 1.7708 | 0.0104 |
| 75 | 1.7812 | 0.0103 |
| 76 | 1.7914 | 0.0102 |
| 77 | 1.8016 | 0.0102 |
| 78 | 1.8117 | 0.0101 |
| 79 | 1.8217 | 0.0100 |
| 80 | 1.8317 | 0.0100 |
| 81 | 1.8415 | 0.0099 |
| 82 | 1.8514 | 0.0098 |
| 83 | 1.8611 | 0.0097 |
| 84 | 1.8708 | 0.0097 |
| 85 | 1.8804 | 0.0096 |
| 86 | 1.8899 | 0.0095 |
| 87 | 1.8994 | 0.0095 |
| 88 | 1.9089 | 0.0094 |
| 89 | 1.9182 | 0.0094 |
| 90 | 1.9275 | 0.0093 |
| 91 | 1.9368 | 0.0092 |
| 92 | 1.9460 | 0.0092 |
| 93 | 1.9551 | 0.0091 |
| 94 | 1.9642 | 0.0091 |
| 95 | 1.9732 | 0.0090 |
| 96 | 1.9822 | 0.0090 |
| 97 | 1.9911 | 0.0089 |
| 98 | 1.9999 | 0.0089 |

| | | |
|---|---|---|
| 99 | 2.0088 | 0.0088 |
| 100 | 2.0175 | 0.0088 |
| 101 | 2.0262 | 0.0087 |
| 102 | 2.0349 | 0.0087 |
| 103 | 2.0435 | 0.0086 |
| 104 | 2.0521 | 0.0086 |
| 105 | 2.0606 | 0.0085 |
| 106 | 2.0691 | 0.0085 |
| 107 | 2.0775 | 0.0084 |
| 108 | 2.0859 | 0.0084 |
| 109 | 2.0942 | 0.0083 |
| 110 | 2.1025 | 0.0083 |
| 111 | 2.1108 | 0.0083 |
| 112 | 2.1190 | 0.0082 |
| 113 | 2.1272 | 0.0082 |
| 114 | 2.1353 | 0.0081 |
| 115 | 2.1434 | 0.0081 |
| 116 | 2.1515 | 0.0081 |
| 117 | 2.1595 | 0.0080 |
| 118 | 2.1675 | 0.0080 |
| 119 | 2.1754 | 0.0079 |
| 120 | 2.1833 | 0.0079 |
| 121 | 2.1912 | 0.0079 |
| 122 | 2.1990 | 0.0078 |
| 123 | 2.2068 | 0.0078 |
| 124 | 2.2145 | 0.0078 |
| 125 | 2.2222 | 0.0077 |
| 126 | 2.2299 | 0.0077 |
| 127 | 2.2376 | 0.0076 |
| 128 | 2.2452 | 0.0076 |
| 129 | 2.2528 | 0.0076 |
| 130 | 2.2603 | 0.0075 |
| 131 | 2.2678 | 0.0075 |
| 132 | 2.2753 | 0.0075 |
| 133 | 2.2828 | 0.0074 |
| 134 | 2.2902 | 0.0074 |
| 135 | 2.2976 | 0.0074 |
| 136 | 2.3049 | 0.0074 |
| 137 | 2.3122 | 0.0073 |
| 138 | 2.3195 | 0.0073 |
| 139 | 2.3268 | 0.0073 |
| 140 | 2.3340 | 0.0072 |
| 141 | 2.3412 | 0.0072 |
| 142 | 2.3484 | 0.0072 |
| 143 | 2.3556 | 0.0071 |
| 144 | 2.3627 | 0.0071 |
| 145 | 2.3698 | 0.0071 |
| 146 | 2.3768 | 0.0071 |
| 147 | 2.3839 | 0.0070 |
| 148 | 2.3909 | 0.0070 |
| 149 | 2.3979 | 0.0070 |
| 150 | 2.4048 | 0.0070 |
| 151 | 2.4118 | 0.0069 |
| 152 | 2.4187 | 0.0069 |
| 153 | 2.4256 | 0.0069 |
| 154 | 2.4324 | 0.0069 |
| 155 | 2.4392 | 0.0068 |
| 156 | 2.4460 | 0.0068 |
| 157 | 2.4528 | 0.0068 |
| 158 | 2.4596 | 0.0068 |
| 159 | 2.4663 | 0.0067 |
| 160 | 2.4730 | 0.0067 |
| 161 | 2.4797 | 0.0067 |
| 162 | 2.4863 | 0.0067 |
| 163 | 2.4930 | 0.0066 |
| 164 | 2.4996 | 0.0066 |
| 165 | 2.5062 | 0.0066 |
| 166 | 2.5128 | 0.0066 |
| 167 | 2.5193 | 0.0065 |
| 168 | 2.5258 | 0.0065 |
| 169 | 2.5323 | 0.0065 |

| | | |
|---|---|---|
| 170 | 2.5388 | 0.0065 |
| 171 | 2.5453 | 0.0065 |
| 172 | 2.5517 | 0.0064 |
| 173 | 2.5581 | 0.0064 |
| 174 | 2.5645 | 0.0064 |
| 175 | 2.5709 | 0.0064 |
| 176 | 2.5772 | 0.0064 |
| 177 | 2.5836 | 0.0063 |
| 178 | 2.5899 | 0.0063 |
| 179 | 2.5962 | 0.0063 |
| 180 | 2.6024 | 0.0063 |
| 181 | 2.6087 | 0.0063 |
| 182 | 2.6149 | 0.0062 |
| 183 | 2.6211 | 0.0062 |
| 184 | 2.6273 | 0.0062 |
| 185 | 2.6335 | 0.0062 |
| 186 | 2.6397 | 0.0062 |
| 187 | 2.6458 | 0.0061 |
| 188 | 2.6519 | 0.0061 |
| 189 | 2.6580 | 0.0061 |
| 190 | 2.6641 | 0.0061 |
| 191 | 2.6702 | 0.0061 |
| 192 | 2.6762 | 0.0060 |
| 193 | 2.6822 | 0.0060 |
| 194 | 2.6882 | 0.0060 |
| 195 | 2.6942 | 0.0060 |
| 196 | 2.7002 | 0.0060 |
| 197 | 2.7062 | 0.0060 |
| 198 | 2.7121 | 0.0059 |
| 199 | 2.7180 | 0.0059 |
| 200 | 2.7239 | 0.0059 |
| 201 | 2.7298 | 0.0059 |
| 202 | 2.7357 | 0.0059 |
| 203 | 2.7416 | 0.0059 |
| 204 | 2.7474 | 0.0058 |
| 205 | 2.7532 | 0.0058 |
| 206 | 2.7590 | 0.0058 |
| 207 | 2.7648 | 0.0058 |
| 208 | 2.7706 | 0.0058 |
| 209 | 2.7764 | 0.0058 |
| 210 | 2.7821 | 0.0057 |
| 211 | 2.7878 | 0.0057 |
| 212 | 2.7936 | 0.0057 |
| 213 | 2.7993 | 0.0057 |
| 214 | 2.8049 | 0.0057 |
| 215 | 2.8106 | 0.0057 |
| 216 | 2.8163 | 0.0057 |
| 217 | 2.8219 | 0.0056 |
| 218 | 2.8275 | 0.0056 |
| 219 | 2.8331 | 0.0056 |
| 220 | 2.8387 | 0.0056 |
| 221 | 2.8443 | 0.0056 |
| 222 | 2.8499 | 0.0056 |
| 223 | 2.8554 | 0.0056 |
| 224 | 2.8610 | 0.0055 |
| 225 | 2.8665 | 0.0055 |
| 226 | 2.8720 | 0.0055 |
| 227 | 2.8775 | 0.0055 |
| 228 | 2.8830 | 0.0055 |
| 229 | 2.8885 | 0.0055 |
| 230 | 2.8939 | 0.0055 |
| 231 | 2.8994 | 0.0054 |
| 232 | 2.9048 | 0.0054 |
| 233 | 2.9102 | 0.0054 |
| 234 | 2.9156 | 0.0054 |
| 235 | 2.9210 | 0.0054 |
| 236 | 2.9264 | 0.0054 |
| 237 | 2.9317 | 0.0054 |
| 238 | 2.9371 | 0.0054 |
| 239 | 2.9424 | 0.0053 |
| 240 | 2.9478 | 0.0053 |

| | | |
|---|---|---|
| 241 | 2.9531 | 0.0053 |
| 242 | 2.9584 | 0.0053 |
| 243 | 2.9637 | 0.0053 |
| 244 | 2.9689 | 0.0053 |
| 245 | 2.9742 | 0.0053 |
| 246 | 2.9795 | 0.0053 |
| 247 | 2.9847 | 0.0052 |
| 248 | 2.9899 | 0.0052 |
| 249 | 2.9951 | 0.0052 |
| 250 | 3.0003 | 0.0052 |
| 251 | 3.0055 | 0.0052 |
| 252 | 3.0107 | 0.0052 |
| 253 | 3.0159 | 0.0052 |
| 254 | 3.0210 | 0.0052 |
| 255 | 3.0262 | 0.0051 |
| 256 | 3.0313 | 0.0051 |
| 257 | 3.0364 | 0.0051 |
| 258 | 3.0416 | 0.0051 |
| 259 | 3.0467 | 0.0051 |
| 260 | 3.0517 | 0.0051 |
| 261 | 3.0568 | 0.0051 |
| 262 | 3.0619 | 0.0051 |
| 263 | 3.0669 | 0.0051 |
| 264 | 3.0720 | 0.0050 |
| 265 | 3.0770 | 0.0050 |
| 266 | 3.0820 | 0.0050 |
| 267 | 3.0871 | 0.0050 |
| 268 | 3.0921 | 0.0050 |
| 269 | 3.0971 | 0.0050 |
| 270 | 3.1020 | 0.0050 |
| 271 | 3.1070 | 0.0050 |
| 272 | 3.1120 | 0.0050 |
| 273 | 3.1169 | 0.0050 |
| 274 | 3.1219 | 0.0049 |
| 275 | 3.1268 | 0.0049 |
| 276 | 3.1317 | 0.0049 |
| 277 | 3.1366 | 0.0049 |
| 278 | 3.1415 | 0.0049 |
| 279 | 3.1464 | 0.0049 |
| 280 | 3.1513 | 0.0049 |
| 281 | 3.1562 | 0.0049 |
| 282 | 3.1610 | 0.0049 |
| 283 | 3.1659 | 0.0048 |
| 284 | 3.1707 | 0.0048 |
| 285 | 3.1755 | 0.0048 |
| 286 | 3.1804 | 0.0048 |
| 287 | 3.1852 | 0.0048 |
| 288 | 3.1900 | 0.0048 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0048 | 0.0008 | 0.0040 |
| 2 | 0.0048 | 0.0008 | 0.0040 |
| 3 | 0.0048 | 0.0008 | 0.0041 |
| 4 | 0.0048 | 0.0008 | 0.0041 |
| 5 | 0.0049 | 0.0008 | 0.0041 |
| 6 | 0.0049 | 0.0008 | 0.0041 |
| 7 | 0.0049 | 0.0008 | 0.0041 |
| 8 | 0.0049 | 0.0008 | 0.0041 |
| 9 | 0.0049 | 0.0008 | 0.0041 |
| 10 | 0.0049 | 0.0008 | 0.0041 |
| 11 | 0.0050 | 0.0008 | 0.0042 |
| 12 | 0.0050 | 0.0008 | 0.0042 |
| 13 | 0.0050 | 0.0008 | 0.0042 |
| 14 | 0.0050 | 0.0008 | 0.0042 |
| 15 | 0.0050 | 0.0008 | 0.0042 |
| 16 | 0.0050 | 0.0008 | 0.0042 |
| 17 | 0.0050 | 0.0008 | 0.0042 |
| 18 | 0.0051 | 0.0008 | 0.0042 |

| | | | |
|---|---|---|---|
| 19 | 0.0051 | 0.0008 | 0.0043 |
| 20 | 0.0051 | 0.0008 | 0.0043 |
| 21 | 0.0051 | 0.0008 | 0.0043 |
| 22 | 0.0051 | 0.0008 | 0.0043 |
| 23 | 0.0051 | 0.0008 | 0.0043 |
| 24 | 0.0052 | 0.0008 | 0.0043 |
| 25 | 0.0052 | 0.0008 | 0.0044 |
| 26 | 0.0052 | 0.0008 | 0.0044 |
| 27 | 0.0052 | 0.0008 | 0.0044 |
| 28 | 0.0052 | 0.0008 | 0.0044 |
| 29 | 0.0053 | 0.0008 | 0.0044 |
| 30 | 0.0053 | 0.0008 | 0.0044 |
| 31 | 0.0053 | 0.0008 | 0.0044 |
| 32 | 0.0053 | 0.0008 | 0.0045 |
| 33 | 0.0053 | 0.0009 | 0.0045 |
| 34 | 0.0053 | 0.0009 | 0.0045 |
| 35 | 0.0054 | 0.0009 | 0.0045 |
| 36 | 0.0054 | 0.0009 | 0.0045 |
| 37 | 0.0054 | 0.0009 | 0.0045 |
| 38 | 0.0054 | 0.0009 | 0.0045 |
| 39 | 0.0054 | 0.0009 | 0.0046 |
| 40 | 0.0055 | 0.0009 | 0.0046 |
| 41 | 0.0055 | 0.0009 | 0.0046 |
| 42 | 0.0055 | 0.0009 | 0.0046 |
| 43 | 0.0055 | 0.0009 | 0.0046 |
| 44 | 0.0055 | 0.0009 | 0.0047 |
| 45 | 0.0056 | 0.0009 | 0.0047 |
| 46 | 0.0056 | 0.0009 | 0.0047 |
| 47 | 0.0056 | 0.0009 | 0.0047 |
| 48 | 0.0056 | 0.0009 | 0.0047 |
| 49 | 0.0057 | 0.0009 | 0.0047 |
| 50 | 0.0057 | 0.0009 | 0.0048 |
| 51 | 0.0057 | 0.0009 | 0.0048 |
| 52 | 0.0057 | 0.0009 | 0.0048 |
| 53 | 0.0057 | 0.0009 | 0.0048 |
| 54 | 0.0058 | 0.0009 | 0.0048 |
| 55 | 0.0058 | 0.0009 | 0.0049 |
| 56 | 0.0058 | 0.0009 | 0.0049 |
| 57 | 0.0058 | 0.0009 | 0.0049 |
| 58 | 0.0059 | 0.0009 | 0.0049 |
| 59 | 0.0059 | 0.0009 | 0.0049 |
| 60 | 0.0059 | 0.0009 | 0.0050 |
| 61 | 0.0059 | 0.0010 | 0.0050 |
| 62 | 0.0060 | 0.0010 | 0.0050 |
| 63 | 0.0060 | 0.0010 | 0.0050 |
| 64 | 0.0060 | 0.0010 | 0.0050 |
| 65 | 0.0060 | 0.0010 | 0.0051 |
| 66 | 0.0061 | 0.0010 | 0.0051 |
| 67 | 0.0061 | 0.0010 | 0.0051 |
| 68 | 0.0061 | 0.0010 | 0.0051 |
| 69 | 0.0062 | 0.0010 | 0.0052 |
| 70 | 0.0062 | 0.0010 | 0.0052 |
| 71 | 0.0062 | 0.0010 | 0.0052 |
| 72 | 0.0062 | 0.0010 | 0.0052 |
| 73 | 0.0063 | 0.0010 | 0.0053 |
| 74 | 0.0063 | 0.0010 | 0.0053 |
| 75 | 0.0063 | 0.0010 | 0.0053 |
| 76 | 0.0064 | 0.0010 | 0.0053 |
| 77 | 0.0064 | 0.0010 | 0.0054 |
| 78 | 0.0064 | 0.0010 | 0.0054 |
| 79 | 0.0065 | 0.0010 | 0.0054 |
| 80 | 0.0065 | 0.0010 | 0.0054 |
| 81 | 0.0065 | 0.0010 | 0.0055 |
| 82 | 0.0065 | 0.0010 | 0.0055 |
| 83 | 0.0066 | 0.0011 | 0.0055 |
| 84 | 0.0066 | 0.0011 | 0.0056 |
| 85 | 0.0067 | 0.0011 | 0.0056 |
| 86 | 0.0067 | 0.0011 | 0.0056 |
| 87 | 0.0067 | 0.0011 | 0.0057 |
| 88 | 0.0068 | 0.0011 | 0.0057 |
| 89 | 0.0068 | 0.0011 | 0.0057 |

| | | | |
|---|---|---|---|
| 90 | 0.0068 | 0.0011 | 0.0057 |
| 91 | 0.0069 | 0.0011 | 0.0058 |
| 92 | 0.0069 | 0.0011 | 0.0058 |
| 93 | 0.0070 | 0.0011 | 0.0058 |
| 94 | 0.0070 | 0.0011 | 0.0059 |
| 95 | 0.0070 | 0.0011 | 0.0059 |
| 96 | 0.0071 | 0.0011 | 0.0059 |
| 97 | 0.0071 | 0.0011 | 0.0060 |
| 98 | 0.0071 | 0.0011 | 0.0060 |
| 99 | 0.0072 | 0.0012 | 0.0061 |
| 100 | 0.0072 | 0.0012 | 0.0061 |
| 101 | 0.0073 | 0.0012 | 0.0061 |
| 102 | 0.0073 | 0.0012 | 0.0062 |
| 103 | 0.0074 | 0.0012 | 0.0062 |
| 104 | 0.0074 | 0.0012 | 0.0062 |
| 105 | 0.0075 | 0.0012 | 0.0063 |
| 106 | 0.0075 | 0.0012 | 0.0063 |
| 107 | 0.0076 | 0.0012 | 0.0064 |
| 108 | 0.0076 | 0.0012 | 0.0064 |
| 109 | 0.0077 | 0.0012 | 0.0065 |
| 110 | 0.0077 | 0.0012 | 0.0065 |
| 111 | 0.0078 | 0.0012 | 0.0065 |
| 112 | 0.0078 | 0.0013 | 0.0066 |
| 113 | 0.0079 | 0.0013 | 0.0066 |
| 114 | 0.0079 | 0.0013 | 0.0067 |
| 115 | 0.0080 | 0.0013 | 0.0067 |
| 116 | 0.0081 | 0.0013 | 0.0068 |
| 117 | 0.0081 | 0.0013 | 0.0068 |
| 118 | 0.0082 | 0.0013 | 0.0069 |
| 119 | 0.0083 | 0.0013 | 0.0069 |
| 120 | 0.0083 | 0.0013 | 0.0070 |
| 121 | 0.0084 | 0.0013 | 0.0070 |
| 122 | 0.0084 | 0.0014 | 0.0071 |
| 123 | 0.0085 | 0.0014 | 0.0072 |
| 124 | 0.0086 | 0.0014 | 0.0072 |
| 125 | 0.0087 | 0.0014 | 0.0073 |
| 126 | 0.0087 | 0.0014 | 0.0073 |
| 127 | 0.0088 | 0.0014 | 0.0074 |
| 128 | 0.0089 | 0.0014 | 0.0074 |
| 129 | 0.0090 | 0.0014 | 0.0075 |
| 130 | 0.0090 | 0.0014 | 0.0076 |
| 131 | 0.0091 | 0.0015 | 0.0077 |
| 132 | 0.0092 | 0.0015 | 0.0077 |
| 133 | 0.0093 | 0.0015 | 0.0078 |
| 134 | 0.0094 | 0.0015 | 0.0079 |
| 135 | 0.0095 | 0.0015 | 0.0080 |
| 136 | 0.0095 | 0.0015 | 0.0080 |
| 137 | 0.0097 | 0.0016 | 0.0081 |
| 138 | 0.0097 | 0.0016 | 0.0082 |
| 139 | 0.0099 | 0.0016 | 0.0083 |
| 140 | 0.0100 | 0.0016 | 0.0084 |
| 141 | 0.0101 | 0.0016 | 0.0085 |
| 142 | 0.0102 | 0.0016 | 0.0085 |
| 143 | 0.0103 | 0.0017 | 0.0087 |
| 144 | 0.0104 | 0.0017 | 0.0087 |
| 145 | 0.0128 | 0.0021 | 0.0108 |
| 146 | 0.0129 | 0.0021 | 0.0109 |
| 147 | 0.0131 | 0.0021 | 0.0110 |
| 148 | 0.0132 | 0.0021 | 0.0111 |
| 149 | 0.0134 | 0.0021 | 0.0112 |
| 150 | 0.0135 | 0.0022 | 0.0113 |
| 151 | 0.0137 | 0.0022 | 0.0115 |
| 152 | 0.0138 | 0.0022 | 0.0116 |
| 153 | 0.0140 | 0.0022 | 0.0118 |
| 154 | 0.0141 | 0.0023 | 0.0119 |
| 155 | 0.0144 | 0.0023 | 0.0121 |
| 156 | 0.0145 | 0.0023 | 0.0122 |
| 157 | 0.0147 | 0.0024 | 0.0124 |
| 158 | 0.0149 | 0.0024 | 0.0125 |
| 159 | 0.0151 | 0.0024 | 0.0127 |
| 160 | 0.0153 | 0.0024 | 0.0128 |

| | | | |
|---|---|---|---|
| 161 | 0.0156 | 0.0025 | 0.0131 |
| 162 | 0.0157 | 0.0025 | 0.0132 |
| 163 | 0.0161 | 0.0026 | 0.0135 |
| 164 | 0.0163 | 0.0026 | 0.0136 |
| 165 | 0.0166 | 0.0027 | 0.0140 |
| 166 | 0.0168 | 0.0027 | 0.0141 |
| 167 | 0.0172 | 0.0028 | 0.0145 |
| 168 | 0.0174 | 0.0028 | 0.0146 |
| 169 | 0.0179 | 0.0029 | 0.0150 |
| 170 | 0.0181 | 0.0029 | 0.0152 |
| 171 | 0.0187 | 0.0030 | 0.0157 |
| 172 | 0.0189 | 0.0030 | 0.0159 |
| 173 | 0.0195 | 0.0031 | 0.0164 |
| 174 | 0.0199 | 0.0032 | 0.0167 |
| 175 | 0.0206 | 0.0033 | 0.0173 |
| 176 | 0.0209 | 0.0034 | 0.0176 |
| 177 | 0.0218 | 0.0035 | 0.0183 |
| 178 | 0.0222 | 0.0036 | 0.0187 |
| 179 | 0.0232 | 0.0037 | 0.0195 |
| 180 | 0.0238 | 0.0038 | 0.0200 |
| 181 | 0.0250 | 0.0040 | 0.0210 |
| 182 | 0.0257 | 0.0041 | 0.0216 |
| 183 | 0.0273 | 0.0044 | 0.0230 |
| 184 | 0.0283 | 0.0045 | 0.0238 |
| 185 | 0.0233 | 0.0037 | 0.0196 |
| 186 | 0.0246 | 0.0039 | 0.0207 |
| 187 | 0.0279 | 0.0045 | 0.0234 |
| 188 | 0.0301 | 0.0048 | 0.0253 |
| 189 | 0.0363 | 0.0058 | 0.0305 |
| 190 | 0.0410 | 0.0065 | 0.0344 |
| 191 | 0.0585 | 0.0065 | 0.0520 |
| 192 | 0.0805 | 0.0065 | 0.0740 |
| 193 | 0.2520 | 0.0065 | 0.2454 |
| 194 | 0.0477 | 0.0065 | 0.0411 |
| 195 | 0.0328 | 0.0053 | 0.0276 |
| 196 | 0.0261 | 0.0042 | 0.0219 |
| 197 | 0.0293 | 0.0047 | 0.0246 |
| 198 | 0.0265 | 0.0042 | 0.0222 |
| 199 | 0.0244 | 0.0039 | 0.0205 |
| 200 | 0.0227 | 0.0036 | 0.0191 |
| 201 | 0.0213 | 0.0034 | 0.0179 |
| 202 | 0.0202 | 0.0032 | 0.0170 |
| 203 | 0.0192 | 0.0031 | 0.0162 |
| 204 | 0.0184 | 0.0029 | 0.0155 |
| 205 | 0.0177 | 0.0028 | 0.0148 |
| 206 | 0.0170 | 0.0027 | 0.0143 |
| 207 | 0.0164 | 0.0026 | 0.0138 |
| 208 | 0.0159 | 0.0025 | 0.0134 |
| 209 | 0.0154 | 0.0025 | 0.0130 |
| 210 | 0.0150 | 0.0024 | 0.0126 |
| 211 | 0.0146 | 0.0023 | 0.0123 |
| 212 | 0.0142 | 0.0023 | 0.0120 |
| 213 | 0.0139 | 0.0022 | 0.0117 |
| 214 | 0.0136 | 0.0022 | 0.0114 |
| 215 | 0.0133 | 0.0021 | 0.0112 |
| 216 | 0.0130 | 0.0021 | 0.0109 |
| 217 | 0.0105 | 0.0017 | 0.0088 |
| 218 | 0.0102 | 0.0016 | 0.0086 |
| 219 | 0.0100 | 0.0016 | 0.0084 |
| 220 | 0.0098 | 0.0016 | 0.0082 |
| 221 | 0.0096 | 0.0015 | 0.0081 |
| 222 | 0.0094 | 0.0015 | 0.0079 |
| 223 | 0.0092 | 0.0015 | 0.0078 |
| 224 | 0.0091 | 0.0015 | 0.0076 |
| 225 | 0.0089 | 0.0014 | 0.0075 |
| 226 | 0.0088 | 0.0014 | 0.0074 |
| 227 | 0.0086 | 0.0014 | 0.0072 |
| 228 | 0.0085 | 0.0014 | 0.0071 |
| 229 | 0.0083 | 0.0013 | 0.0070 |
| 230 | 0.0082 | 0.0013 | 0.0069 |
| 231 | 0.0081 | 0.0013 | 0.0068 |

| | | | |
|---|---|---|---|
| 232 | 0.0080 | 0.0013 | 0.0067 |
| 233 | 0.0079 | 0.0013 | 0.0066 |
| 234 | 0.0078 | 0.0012 | 0.0065 |
| 235 | 0.0076 | 0.0012 | 0.0064 |
| 236 | 0.0075 | 0.0012 | 0.0063 |
| 237 | 0.0074 | 0.0012 | 0.0063 |
| 238 | 0.0074 | 0.0012 | 0.0062 |
| 239 | 0.0073 | 0.0012 | 0.0061 |
| 240 | 0.0072 | 0.0012 | 0.0060 |
| 241 | 0.0071 | 0.0011 | 0.0060 |
| 242 | 0.0070 | 0.0011 | 0.0059 |
| 243 | 0.0069 | 0.0011 | 0.0058 |
| 244 | 0.0069 | 0.0011 | 0.0058 |
| 245 | 0.0068 | 0.0011 | 0.0057 |
| 246 | 0.0067 | 0.0011 | 0.0056 |
| 247 | 0.0066 | 0.0011 | 0.0056 |
| 248 | 0.0066 | 0.0011 | 0.0055 |
| 249 | 0.0065 | 0.0010 | 0.0055 |
| 250 | 0.0064 | 0.0010 | 0.0054 |
| 251 | 0.0064 | 0.0010 | 0.0054 |
| 252 | 0.0063 | 0.0010 | 0.0053 |
| 253 | 0.0063 | 0.0010 | 0.0053 |
| 254 | 0.0062 | 0.0010 | 0.0052 |
| 255 | 0.0061 | 0.0010 | 0.0052 |
| 256 | 0.0061 | 0.0010 | 0.0051 |
| 257 | 0.0060 | 0.0010 | 0.0051 |
| 258 | 0.0060 | 0.0010 | 0.0050 |
| 259 | 0.0059 | 0.0009 | 0.0050 |
| 260 | 0.0059 | 0.0009 | 0.0049 |
| 261 | 0.0058 | 0.0009 | 0.0049 |
| 262 | 0.0058 | 0.0009 | 0.0049 |
| 263 | 0.0057 | 0.0009 | 0.0048 |
| 264 | 0.0057 | 0.0009 | 0.0048 |
| 265 | 0.0056 | 0.0009 | 0.0047 |
| 266 | 0.0056 | 0.0009 | 0.0047 |
| 267 | 0.0056 | 0.0009 | 0.0047 |
| 268 | 0.0055 | 0.0009 | 0.0046 |
| 269 | 0.0055 | 0.0009 | 0.0046 |
| 270 | 0.0054 | 0.0009 | 0.0046 |
| 271 | 0.0054 | 0.0009 | 0.0045 |
| 272 | 0.0054 | 0.0009 | 0.0045 |
| 273 | 0.0053 | 0.0009 | 0.0045 |
| 274 | 0.0053 | 0.0008 | 0.0044 |
| 275 | 0.0052 | 0.0008 | 0.0044 |
| 276 | 0.0052 | 0.0008 | 0.0044 |
| 277 | 0.0052 | 0.0008 | 0.0043 |
| 278 | 0.0051 | 0.0008 | 0.0043 |
| 279 | 0.0051 | 0.0008 | 0.0043 |
| 280 | 0.0051 | 0.0008 | 0.0043 |
| 281 | 0.0050 | 0.0008 | 0.0042 |
| 282 | 0.0050 | 0.0008 | 0.0042 |
| 283 | 0.0050 | 0.0008 | 0.0042 |
| 284 | 0.0049 | 0.0008 | 0.0041 |
| 285 | 0.0049 | 0.0008 | 0.0041 |
| 286 | 0.0049 | 0.0008 | 0.0041 |
| 287 | 0.0048 | 0.0008 | 0.0041 |
| 288 | 0.0048 | 0.0008 | 0.0040 |

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Total soil rain loss = 0.47(In)
Total effective rainfall = 2.72(In)
Peak flow rate in flood hydrograph = 12.09(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

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Hydrograph in 5 Minute intervals ((CFS))

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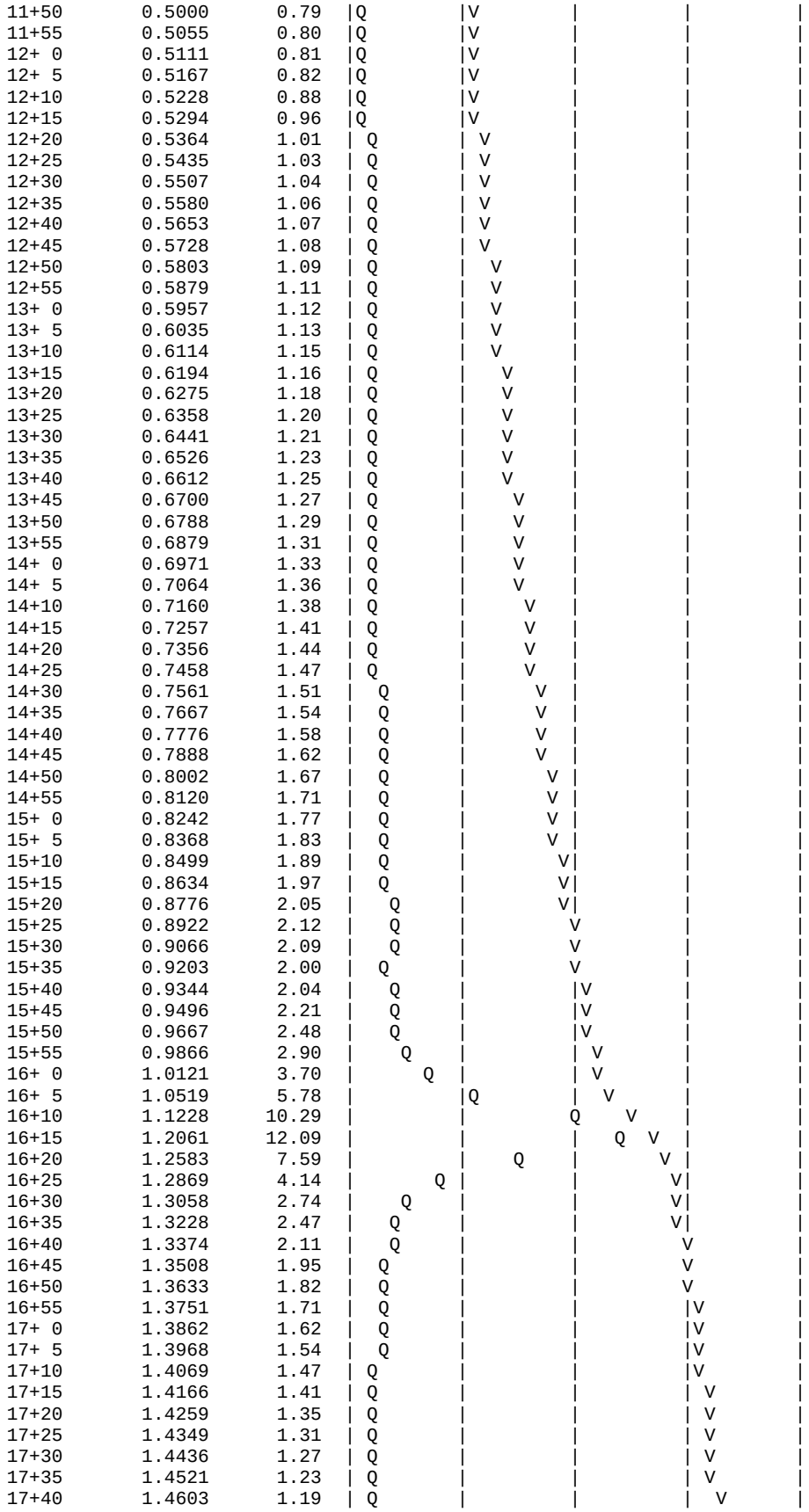
Time(h+m) Volume Ac.Ft Q(CFS) 0 5.0 10.0 15.0 20.0

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0001 | 0.02 | Q | | | | |
| 0+10 | 0.0009 | 0.12 | Q | | | | |
| 0+15 | 0.0028 | 0.27 | Q | | | | |
| 0+20 | 0.0052 | 0.35 | Q | | | | |
| 0+25 | 0.0077 | 0.37 | Q | | | | |
| 0+30 | 0.0103 | 0.38 | Q | | | | |
| 0+35 | 0.0130 | 0.38 | Q | | | | |
| 0+40 | 0.0157 | 0.39 | Q | | | | |
| 0+45 | 0.0183 | 0.39 | Q | | | | |
| 0+50 | 0.0210 | 0.39 | Q | | | | |
| 0+55 | 0.0237 | 0.39 | Q | | | | |
| 1+ 0 | 0.0264 | 0.39 | Q | | | | |
| 1+ 5 | 0.0291 | 0.39 | Q | | | | |
| 1+10 | 0.0318 | 0.39 | Q | | | | |
| 1+15 | 0.0345 | 0.39 | Q | | | | |
| 1+20 | 0.0372 | 0.40 | Q | | | | |
| 1+25 | 0.0399 | 0.40 | Q | | | | |
| 1+30 | 0.0427 | 0.40 | Q | | | | |
| 1+35 | 0.0454 | 0.40 | QV | | | | |
| 1+40 | 0.0482 | 0.40 | QV | | | | |
| 1+45 | 0.0510 | 0.40 | QV | | | | |
| 1+50 | 0.0537 | 0.40 | QV | | | | |
| 1+55 | 0.0565 | 0.40 | QV | | | | |
| 2+ 0 | 0.0593 | 0.41 | QV | | | | |
| 2+ 5 | 0.0621 | 0.41 | QV | | | | |
| 2+10 | 0.0649 | 0.41 | QV | | | | |
| 2+15 | 0.0678 | 0.41 | QV | | | | |
| 2+20 | 0.0706 | 0.41 | QV | | | | |
| 2+25 | 0.0734 | 0.41 | QV | | | | |
| 2+30 | 0.0763 | 0.41 | QV | | | | |
| 2+35 | 0.0792 | 0.42 | QV | | | | |
| 2+40 | 0.0820 | 0.42 | QV | | | | |
| 2+45 | 0.0849 | 0.42 | QV | | | | |
| 2+50 | 0.0878 | 0.42 | QV | | | | |
| 2+55 | 0.0907 | 0.42 | Q V | | | | |
| 3+ 0 | 0.0936 | 0.42 | Q V | | | | |
| 3+ 5 | 0.0965 | 0.42 | Q V | | | | |
| 3+10 | 0.0995 | 0.43 | Q V | | | | |
| 3+15 | 0.1024 | 0.43 | Q V | | | | |
| 3+20 | 0.1054 | 0.43 | Q V | | | | |
| 3+25 | 0.1084 | 0.43 | Q V | | | | |
| 3+30 | 0.1113 | 0.43 | Q V | | | | |
| 3+35 | 0.1143 | 0.43 | Q V | | | | |
| 3+40 | 0.1173 | 0.44 | Q V | | | | |
| 3+45 | 0.1203 | 0.44 | Q V | | | | |
| 3+50 | 0.1234 | 0.44 | Q V | | | | |
| 3+55 | 0.1264 | 0.44 | Q V | | | | |
| 4+ 0 | 0.1294 | 0.44 | Q V | | | | |
| 4+ 5 | 0.1325 | 0.44 | Q V | | | | |
| 4+10 | 0.1356 | 0.45 | Q  V | | | | |
| 4+15 | 0.1386 | 0.45 | Q  V | | | | |
| 4+20 | 0.1417 | 0.45 | Q  V | | | | |
| 4+25 | 0.1448 | 0.45 | Q  V | | | | |
| 4+30 | 0.1480 | 0.45 | Q  V | | | | |
| 4+35 | 0.1511 | 0.45 | Q  V | | | | |
| 4+40 | 0.1542 | 0.46 | Q  V | | | | |
| 4+45 | 0.1574 | 0.46 | Q  V | | | | |
| 4+50 | 0.1606 | 0.46 | Q  V | | | | |
| 4+55 | 0.1638 | 0.46 | Q  V | | | | |
| 5+ 0 | 0.1669 | 0.46 | Q  V | | | | |
| 5+ 5 | 0.1702 | 0.47 | Q  V | | | | |
| 5+10 | 0.1734 | 0.47 | Q  V | | | | |
| 5+15 | 0.1766 | 0.47 | Q  V | | | | |
| 5+20 | 0.1799 | 0.47 | Q   V | | | | |
| 5+25 | 0.1831 | 0.47 | Q   V | | | | |
| 5+30 | 0.1864 | 0.48 | Q   V | | | | |
| 5+35 | 0.1897 | 0.48 | Q   V | | | | |
| 5+40 | 0.1930 | 0.48 | Q   V | | | | |
| 5+45 | 0.1964 | 0.48 | Q   V | | | | |
| 5+50 | 0.1997 | 0.48 | Q   V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5+55 | 0.2030 | 0.49 | Q V | \| | \| | \| | \| |
| 6+ 0 | 0.2064 | 0.49 | Q V | \| | \| | \| | \| |
| 6+ 5 | 0.2098 | 0.49 | Q V | \| | \| | \| | \| |
| 6+10 | 0.2132 | 0.49 | Q V | \| | \| | \| | \| |
| 6+15 | 0.2166 | 0.50 | Q V | \| | \| | \| | \| |
| 6+20 | 0.2201 | 0.50 | Q V | \| | \| | \| | \| |
| 6+25 | 0.2235 | 0.50 | \|Q V | \| | \| | \| | \| |
| 6+30 | 0.2270 | 0.50 | \|Q V | \| | \| | \| | \| |
| 6+35 | 0.2305 | 0.51 | \|Q V | \| | \| | \| | \| |
| 6+40 | 0.2340 | 0.51 | \|Q V | \| | \| | \| | \| |
| 6+45 | 0.2375 | 0.51 | \|Q V | \| | \| | \| | \| |
| 6+50 | 0.2410 | 0.51 | \|Q V | \| | \| | \| | \| |
| 6+55 | 0.2446 | 0.52 | \|Q V | \| | \| | \| | \| |
| 7+ 0 | 0.2481 | 0.52 | \|Q V | \| | \| | \| | \| |
| 7+ 5 | 0.2517 | 0.52 | \|Q V | \| | \| | \| | \| |
| 7+10 | 0.2553 | 0.52 | \|Q V | \| | \| | \| | \| |
| 7+15 | 0.2590 | 0.53 | \|Q V | \| | \| | \| | \| |
| 7+20 | 0.2626 | 0.53 | \|Q V | \| | \| | \| | \| |
| 7+25 | 0.2663 | 0.53 | \|Q V | \| | \| | \| | \| |
| 7+30 | 0.2700 | 0.54 | \|Q V | \| | \| | \| | \| |
| 7+35 | 0.2737 | 0.54 | \|Q V | \| | \| | \| | \| |
| 7+40 | 0.2774 | 0.54 | \|Q V | \| | \| | \| | \| |
| 7+45 | 0.2812 | 0.54 | \|Q V | \| | \| | \| | \| |
| 7+50 | 0.2849 | 0.55 | \|Q V | \| | \| | \| | \| |
| 7+55 | 0.2887 | 0.55 | \|Q V | \| | \| | \| | \| |
| 8+ 0 | 0.2925 | 0.55 | \|Q V | \| | \| | \| | \| |
| 8+ 5 | 0.2964 | 0.56 | \|Q V | \| | \| | \| | \| |
| 8+10 | 0.3002 | 0.56 | \|Q V | \| | \| | \| | \| |
| 8+15 | 0.3041 | 0.56 | \|Q V | \| | \| | \| | \| |
| 8+20 | 0.3080 | 0.57 | \|Q V | \| | \| | \| | \| |
| 8+25 | 0.3119 | 0.57 | \|Q V | \| | \| | \| | \| |
| 8+30 | 0.3159 | 0.57 | \|Q V | \| | \| | \| | \| |
| 8+35 | 0.3199 | 0.58 | \|Q V | \| | \| | \| | \| |
| 8+40 | 0.3239 | 0.58 | \|Q V | \| | \| | \| | \| |
| 8+45 | 0.3279 | 0.58 | \|Q V | \| | \| | \| | \| |
| 8+50 | 0.3319 | 0.59 | \|Q V | \| | \| | \| | \| |
| 8+55 | 0.3360 | 0.59 | \|Q V | \| | \| | \| | \| |
| 9+ 0 | 0.3401 | 0.60 | \|Q V | \| | \| | \| | \| |
| 9+ 5 | 0.3442 | 0.60 | \|Q V | \| | \| | \| | \| |
| 9+10 | 0.3484 | 0.60 | \|Q V | \| | \| | \| | \| |
| 9+15 | 0.3526 | 0.61 | \|Q V | \| | \| | \| | \| |
| 9+20 | 0.3568 | 0.61 | \|Q V | \| | \| | \| | \| |
| 9+25 | 0.3610 | 0.62 | \|Q V | \| | \| | \| | \| |
| 9+30 | 0.3653 | 0.62 | \|Q V | \| | \| | \| | \| |
| 9+35 | 0.3696 | 0.62 | \|Q V | \| | \| | \| | \| |
| 9+40 | 0.3739 | 0.63 | \|Q V | \| | \| | \| | \| |
| 9+45 | 0.3783 | 0.63 | \|Q V | \| | \| | \| | \| |
| 9+50 | 0.3827 | 0.64 | \|Q V | \| | \| | \| | \| |
| 9+55 | 0.3871 | 0.64 | \|Q V | \| | \| | \| | \| |
| 10+ 0 | 0.3916 | 0.65 | \|Q V | \| | \| | \| | \| |
| 10+ 5 | 0.3961 | 0.65 | \|Q V | \| | \| | \| | \| |
| 10+10 | 0.4006 | 0.66 | \|Q V\| | \| | \| | \| | \| |
| 10+15 | 0.4052 | 0.66 | \|Q V\| | \| | \| | \| | \| |
| 10+20 | 0.4098 | 0.67 | \|Q V\| | \| | \| | \| | \| |
| 10+25 | 0.4144 | 0.67 | \|Q V\| | \| | \| | \| | \| |
| 10+30 | 0.4191 | 0.68 | \|Q V\| | \| | \| | \| | \| |
| 10+35 | 0.4238 | 0.69 | \|Q V\| | \| | \| | \| | \| |
| 10+40 | 0.4286 | 0.69 | \|Q V\| | \| | \| | \| | \| |
| 10+45 | 0.4334 | 0.70 | \|Q V\| | \| | \| | \| | \| |
| 10+50 | 0.4382 | 0.70 | \|Q V\| | \| | \| | \| | \| |
| 10+55 | 0.4431 | 0.71 | \|Q V | \| | \| | \| | \| |
| 11+ 0 | 0.4480 | 0.72 | \|Q V | \| | \| | \| | \| |
| 11+ 5 | 0.4530 | 0.72 | \|Q V | \| | \| | \| | \| |
| 11+10 | 0.4580 | 0.73 | \|Q V | \| | \| | \| | \| |
| 11+15 | 0.4631 | 0.74 | \|Q V | \| | \| | \| | \| |
| 11+20 | 0.4682 | 0.74 | \|Q V | \| | \| | \| | \| |
| 11+25 | 0.4734 | 0.75 | \|Q V | \| | \| | \| | \| |
| 11+30 | 0.4786 | 0.76 | \|Q V | \| | \| | \| | \| |
| 11+35 | 0.4839 | 0.77 | \|Q V | \| | \| | \| | \| |
| 11+40 | 0.4892 | 0.77 | \|Q \|V | \| | \| | \| | \| |
| 11+45 | 0.4946 | 0.78 | \|Q \|V | \| | \| | \| | \| |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17+45 | 1.4683 | 1.16 | \| Q | \| | \| | \| V | \| |
| 17+50 | 1.4761 | 1.13 | \| Q | \| | \| | \| V | \| |
| 17+55 | 1.4837 | 1.10 | \| Q | \| | \| | \| V | \| |
| 18+ 0 | 1.4911 | 1.08 | \| Q | \| | \| | \| V | \| |
| 18+ 5 | 1.4983 | 1.05 | \| Q | \| | \| | \| V | \| |
| 18+10 | 1.5051 | 0.98 | \|Q | \| | \| | \| V | \| |
| 18+15 | 1.5112 | 0.89 | \|Q | \| | \| | \| V | \| |
| 18+20 | 1.5169 | 0.83 | \|Q | \| | \| | \| V | \| |
| 18+25 | 1.5224 | 0.80 | \|Q | \| | \| | \| V | \| |
| 18+30 | 1.5278 | 0.78 | \|Q | \| | \| | \| V | \| |
| 18+35 | 1.5331 | 0.76 | \|Q | \| | \| | \| V | \| |
| 18+40 | 1.5382 | 0.75 | \|Q | \| | \| | \| V | \| |
| 18+45 | 1.5433 | 0.73 | \|Q | \| | \| | \| V | \| |
| 18+50 | 1.5482 | 0.72 | \|Q | \| | \| | \| V | \| |
| 18+55 | 1.5531 | 0.71 | \|Q | \| | \| | \| V | \| |
| 19+ 0 | 1.5579 | 0.70 | \|Q | \| | \| | \| V | \| |
| 19+ 5 | 1.5626 | 0.68 | \|Q | \| | \| | \| V | \| |
| 19+10 | 1.5672 | 0.67 | \|Q | \| | \| | \| V | \| |
| 19+15 | 1.5718 | 0.66 | \|Q | \| | \| | \| V | \| |
| 19+20 | 1.5763 | 0.65 | \|Q | \| | \| | \| V | \| |
| 19+25 | 1.5807 | 0.64 | \|Q | \| | \| | \| V | \| |
| 19+30 | 1.5850 | 0.63 | \|Q | \| | \| | \| V | \| |
| 19+35 | 1.5893 | 0.62 | \|Q | \| | \| | \| V | \| |
| 19+40 | 1.5936 | 0.61 | \|Q | \| | \| | \| V | \| |
| 19+45 | 1.5978 | 0.61 | \|Q | \| | \| | \| V | \| |
| 19+50 | 1.6019 | 0.60 | \|Q | \| | \| | \| V | \| |
| 19+55 | 1.6059 | 0.59 | \|Q | \| | \| | \| V | \| |
| 20+ 0 | 1.6100 | 0.58 | \|Q | \| | \| | \| V | \| |
| 20+ 5 | 1.6139 | 0.58 | \|Q | \| | \| | \| V | \| |
| 20+10 | 1.6179 | 0.57 | \|Q | \| | \| | \| V | \| |
| 20+15 | 1.6217 | 0.56 | \|Q | \| | \| | \| V | \| |
| 20+20 | 1.6256 | 0.56 | \|Q | \| | \| | \| V | \| |
| 20+25 | 1.6293 | 0.55 | \|Q | \| | \| | \| V | \| |
| 20+30 | 1.6331 | 0.54 | \|Q | \| | \| | \| V | \| |
| 20+35 | 1.6368 | 0.54 | \|Q | \| | \| | \| V | \| |
| 20+40 | 1.6404 | 0.53 | \|Q | \| | \| | \| V | \| |
| 20+45 | 1.6441 | 0.53 | \|Q | \| | \| | \| V | \| |
| 20+50 | 1.6477 | 0.52 | \|Q | \| | \| | \| V | \| |
| 20+55 | 1.6512 | 0.52 | \|Q | \| | \| | \| V | \| |
| 21+ 0 | 1.6547 | 0.51 | \|Q | \| | \| | \| V | \| |
| 21+ 5 | 1.6582 | 0.51 | \|Q | \| | \| | \| V | \| |
| 21+10 | 1.6616 | 0.50 | \|Q | \| | \| | \| V | \| |
| 21+15 | 1.6651 | 0.50 | Q | \| | \| | \| V | \| |
| 21+20 | 1.6684 | 0.49 | Q | \| | \| | \| V | \| |
| 21+25 | 1.6718 | 0.49 | Q | \| | \| | \| V | \| |
| 21+30 | 1.6751 | 0.48 | Q | \| | \| | \| V | \| |
| 21+35 | 1.6784 | 0.48 | Q | \| | \| | \| V | \| |
| 21+40 | 1.6817 | 0.47 | Q | \| | \| | \| V | \| |
| 21+45 | 1.6849 | 0.47 | Q | \| | \| | \| V | \| |
| 21+50 | 1.6881 | 0.47 | Q | \| | \| | \| V | \| |
| 21+55 | 1.6913 | 0.46 | Q | \| | \| | \| V | \| |
| 22+ 0 | 1.6944 | 0.46 | Q | \| | \| | \| V | \| |
| 22+ 5 | 1.6976 | 0.45 | Q | \| | \| | \| V | \| |
| 22+10 | 1.7007 | 0.45 | Q | \| | \| | \| V | \| |
| 22+15 | 1.7037 | 0.45 | Q | \| | \| | \| V | \| |
| 22+20 | 1.7068 | 0.44 | Q | \| | \| | \| V | \| |
| 22+25 | 1.7098 | 0.44 | Q | \| | \| | \| V | \| |
| 22+30 | 1.7128 | 0.44 | Q | \| | \| | \| V | \| |
| 22+35 | 1.7158 | 0.43 | Q | \| | \| | \| V | \| |
| 22+40 | 1.7188 | 0.43 | Q | \| | \| | \| V | \| |
| 22+45 | 1.7217 | 0.43 | Q | \| | \| | \| V | \| |
| 22+50 | 1.7247 | 0.42 | Q | \| | \| | \| V | \| |
| 22+55 | 1.7276 | 0.42 | Q | \| | \| | \| V | \| |
| 23+ 0 | 1.7304 | 0.42 | Q | \| | \| | \| V | \| |
| 23+ 5 | 1.7333 | 0.42 | Q | \| | \| | \| V | \| |
| 23+10 | 1.7361 | 0.41 | Q | \| | \| | \| V | \| |
| 23+15 | 1.7390 | 0.41 | Q | \| | \| | \| V | \| |
| 23+20 | 1.7418 | 0.41 | Q | \| | \| | \| V | \| |
| 23+25 | 1.7445 | 0.40 | Q | \| | \| | \| V | \| |
| 23+30 | 1.7473 | 0.40 | Q | \| | \| | \| V | \| |
| 23+35 | 1.7501 | 0.40 | Q | \| | \| | \| V | \| |

```
   23+40       1.7528      0.40  Q         |         |         |        V|
   23+45       1.7555      0.39  Q         |         |         |        V|
   23+50       1.7582      0.39  Q         |         |         |        V|
   23+55       1.7609      0.39  Q         |         |         |        V|
   24+ 0       1.7635      0.39  Q         |         |         |        V|
   24+ 5       1.7661      0.37  Q         |         |         |        V|
   24+10       1.7679      0.26  Q         |         |         |        V|
   24+15       1.7687      0.11  Q         |         |         |        V|
   24+20       1.7689      0.04  Q         |         |         |        V|
   24+25       1.7690      0.01  Q         |         |         |        V|
   24+30       1.7690      0.00  Q         |         |         |         V
-------------------------------------------------------------------------
```

# Flood Routing Analysis
# Detention Chamber Routing
# (Contech CMP-2)

**Detention Chamber Volume Table (348'-pipe Length, Total 4 Pipes, 5'Dia. Each)**

(Refer to the Incremental Volume Spreadsheet)

| Total Depth | Elevation | Volume (cf) | Volume (ac-ft):4 Pipes | Det Vol. | Outflow (cfs)-100yr Storm |
|---|---|---|---|---|---|
| 0.0 | 930.0 | 0 | 0.00 | | 0.00 |
| | | | | | |
| 0.5 | 930.5 | 2,065 | 0.05 | | 0.00 |
| Detention | | | Inf. Vol. 0.10 ac-ft | | |
| 1.5 | 931.5 | 7,502 | 0.17 | 0.12 | 0.50 |
| | | | | | |
| 3.0 | 933.0 | 19,239 | 0.44 | 0.39 | 1.50 |
| | | | | | |
| 4.5 | 934.5 | 31,543 | 0.72 | 0.68 | 4.30 |
| | | | | | |
| 6.0 | 936.0 | 41,268 | 0.95 | 0.90 | 8.00 |
| | | | | | |
| 6.7 | 936.7 | 44,021 | 1.01 | 0.96 | 8.70 |
| | | | | | |
| | | | | | |
| | | | | | |

Det Vol (Total) 0.96 AC-FT

**DETENTION VOLUME IN CHAMBER SYSTEM CMP-2: 0.96 AC-FT = 41,818 CF**

**MAX. MITIGATED OUTFLOW FROM DETENTION CHAMBER: 8.3 CFS = 29,880 CF/HR (8.3*3600)**

**TIME TO EMPTY THE DETNTION WATER FROM DETENTION CHAMBER: 1.40 HRS (41,818 / 29,880)**

Date: 6/21/2023
Project Name: Detention Chamber System-1 - 32851 (6-21-2023 21-23-50)

City / County:
State:

Designed By:
Company:
Telephone:

# CMP: Underground Detention System Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. This tool is only applicable for rectangular shaped systems.

## Summary of Inputs

| System Information | | Backfill Information | | Pipe & Analysis Information | |
|---|---|---|---|---|---|
| Out-to-out length (ft): | 348.0 | Backfill Porosity (%): | 40% | System Diameter (in): | 60 |
| Out-to-out width (ft): | 27.5 | Depth Above Pipe (in): | 12.0 | Pipe Spacing (in): | 30 |
| Number of Manifolds (ea): | 1.0 | Depth Below Pipe (in): | 9.0 | Incremental Analysis (in): | 2 |
| Number of Barrels (ea): | 4.0 | Width At Ends (ft): | 1.0 | System Invert (Elevation): | 0 |
| | | Width At Sides (ft): | 1.0 | | |

## Storage Volume Estimation

| System | | Pipe | | Stone | | Total System | | Miscellaneous | |
|---|---|---|---|---|---|---|---|---|---|
| Depth (ft) | Elevation (ft) | Incremental Storage (cf) | Cumulative Storage (cf) | Incremental Storage (cf) | Cumulative Storage (cf) | Incremental Storage (cf) | Cumulative Storage (cf) | Percent Open Storage (%) | Ave. Surface Area (sf) |
| 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0% | 4,130.0 |
| 0.17 | 0.16 | 0.0 | 0.0 | 688.3 | 688.3 | 688.3 | 688.3 | 0.0% | 4,130.0 |
| 0.33 | 0.33 | 0.0 | 0.0 | 688.3 | 1,376.7 | 688.3 | 1,376.7 | 0.0% | 4,130.0 |
| 0.50 | 0.50 | 0.0 | 0.0 | 688.3 | 2,065.0 | 688.3 | 2,065.0 | 0.0% | 4,130.0 |
| 0.67 | 0.66 | 0.0 | 0.0 | 688.3 | 2,753.3 | 688.3 | 2,753.3 | 0.0% | 4,130.0 |
| 0.83 | 0.83 | 0.0 | 0.0 | 688.3 | 3,441.7 | 688.3 | 3,441.7 | 0.0% | 4,130.0 |
| 1.00 | 1.00 | 281.0 | 281.0 | 575.9 | 4,017.6 | 857.0 | 4,298.6 | 6.5% | 5,637.3 |
| 1.17 | 1.16 | 505.7 | 786.7 | 486.1 | 4,503.6 | 991.8 | 5,290.4 | 14.9% | 6,224.6 |
| 1.33 | 1.33 | 643.4 | 1,430.1 | 431.0 | 4,934.6 | 1,074.4 | 6,364.7 | 22.5% | 6,649.1 |
| 1.50 | 1.50 | 748.0 | 2,178.1 | 389.1 | 5,323.8 | 1,137.1 | 7,501.9 | 29.0% | 6,984.4 |
| 1.67 | 1.66 | 832.3 | 3,010.4 | 355.4 | 5,679.2 | 1,187.7 | 8,689.6 | 34.6% | 7,259.4 |
| 1.83 | 1.83 | 902.1 | 3,912.4 | 327.5 | 6,006.7 | 1,229.6 | 9,919.1 | 39.4% | 7,488.8 |
| 2.00 | 2.00 | 960.5 | 4,873.0 | 304.1 | 6,310.8 | 1,264.7 | 11,183.8 | 43.6% | 7,681.5 |
| 2.17 | 2.16 | 1,009.7 | 5,882.6 | 284.5 | 6,595.3 | 1,294.1 | 12,477.9 | 47.1% | 7,843.3 |
| 2.33 | 2.33 | 1,050.8 | 6,933.4 | 268.0 | 6,863.3 | 1,318.8 | 13,796.7 | 50.3% | 7,978.0 |
| 2.50 | 2.50 | 1,084.8 | 8,018.2 | 254.4 | 7,117.7 | 1,339.2 | 15,135.9 | 53.0% | 8,088.4 |
| 2.67 | 2.66 | 1,112.3 | 9,130.5 | 243.4 | 7,361.2 | 1,355.7 | 16,491.6 | 55.4% | 8,176.5 |
| 2.83 | 2.83 | 1,133.8 | 10,264.3 | 234.8 | 7,596.0 | 1,368.6 | 17,860.2 | 57.5% | 8,243.7 |
| 3.00 | 3.00 | 1,149.7 | 11,414.0 | 228.4 | 7,824.4 | 1,378.2 | 19,238.4 | 59.3% | 8,291.0 |

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3.17 | 3.16 | 1,160.2 | 12,574.2 | 224.3 | 8,048.7 | 1,384.4 | 20,622.8 | 61.0% | 8,319.2 |
| 3.33 | 3.33 | 1,165.4 | 13,739.6 | 222.2 | 8,270.8 | 1,387.6 | 22,010.4 | 62.4% | 8,328.5 |
| 3.50 | 3.50 | 1,165.4 | 14,904.9 | 222.2 | 8,493.0 | 1,387.6 | 23,398.0 | 63.7% | 8,319.2 |
| 3.67 | 3.66 | 1,160.2 | 16,065.1 | 224.3 | 8,717.3 | 1,384.4 | 24,782.4 | 64.8% | 8,291.0 |
| 3.83 | 3.83 | 1,149.7 | 17,214.8 | 228.4 | 8,945.7 | 1,378.2 | 26,160.6 | 65.8% | 8,243.7 |
| 4.00 | 4.00 | 1,133.8 | 18,348.7 | 234.8 | 9,180.5 | 1,368.6 | 27,529.2 | 66.7% | 8,176.5 |
| 4.17 | 4.16 | 1,112.3 | 19,460.9 | 243.4 | 9,424.0 | 1,355.7 | 28,884.9 | 67.4% | 8,088.4 |
| 4.33 | 4.33 | 1,084.8 | 20,545.7 | 254.4 | 9,678.4 | 1,339.2 | 30,224.1 | 68.0% | 7,978.0 |
| 4.50 | 4.50 | 1,050.8 | 21,596.5 | 268.0 | 9,946.4 | 1,318.8 | 31,542.9 | 68.5% | 7,843.3 |
| 4.67 | 4.66 | 1,009.7 | 22,606.1 | 284.5 | 10,230.9 | 1,294.1 | 32,837.0 | 68.8% | 7,681.5 |
| 4.83 | 4.83 | 960.5 | 23,566.7 | 304.1 | 10,535.0 | 1,264.7 | 34,101.7 | 69.1% | 7,488.8 |
| 5.00 | 5.00 | 902.1 | 24,468.8 | 327.5 | 10,862.5 | 1,229.6 | 35,331.3 | 69.3% | 7,259.4 |
| 5.17 | 5.16 | 832.3 | 25,301.0 | 355.4 | 11,217.9 | 1,187.7 | 36,519.0 | 69.3% | 6,984.4 |
| 5.33 | 5.33 | 748.0 | 26,049.0 | 389.1 | 11,607.1 | 1,137.1 | 37,656.1 | 69.2% | 6,649.1 |
| 5.50 | 5.50 | 643.4 | 26,692.4 | 431.0 | 12,038.0 | 1,074.4 | 38,730.4 | 68.9% | 6,224.6 |
| 5.67 | 5.66 | 505.7 | 27,198.1 | 486.1 | 12,524.1 | 991.8 | 39,722.2 | 68.5% | 5,637.3 |
| 5.83 | 5.83 | 281.0 | 27,479.1 | 575.9 | 13,100.0 | 857.0 | 40,579.1 | 67.7% | 4,130.0 |
| 6.00 | 6.00 | 0.0 | 27,479.1 | 688.3 | 13,788.4 | 688.3 | 41,267.5 | 66.6% | 4,130.0 |
| 6.17 | 6.16 | 0.0 | 27,479.1 | 688.3 | 14,476.7 | 688.3 | 41,955.8 | 65.5% | 4,130.0 |
| 6.33 | 6.33 | 0.0 | 27,479.1 | 688.3 | 15,165.0 | 688.3 | 42,644.1 | 64.4% | 4,130.0 |
| 6.50 | 6.50 | 0.0 | 27,479.1 | 688.3 | 15,853.4 | 688.3 | 43,332.5 | 63.4% | 4,130.0 |
| 6.67 | 6.66 | 0.0 | 27,479.1 | 688.3 | 16,541.7 | 688.3 | 44,020.8 | 62.4% | 4,130.0 |

These results are submitted to you as a guideline only, without liability on the part of CONTECH Engineered Solutions, LLC for accuracy or suitability to any particular application, and are subject to your verification.

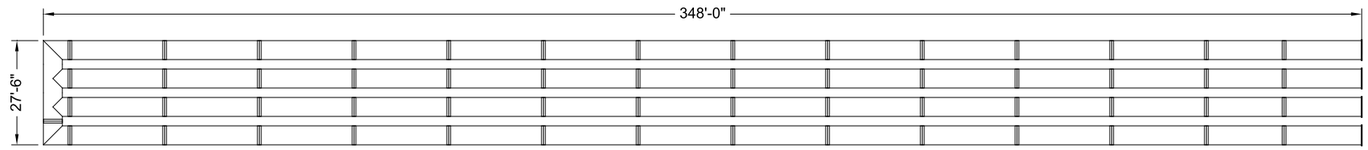
# PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,400 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = N/A
- PIPE STORAGE VOLUME = 27,479 CF
- BACKFILL STORAGE VOLUME = 16,886 CF
- TOTAL STORAGE PROVIDED = 44,365 CF

PIPE DETAILS
- DIAMETER = 60"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 30"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 12"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 9"




NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

## ASSEMBLY
SCALE: 1" = 40'

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| DATE | REVISION DESCRIPTION | BY |
|---|---|---|
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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

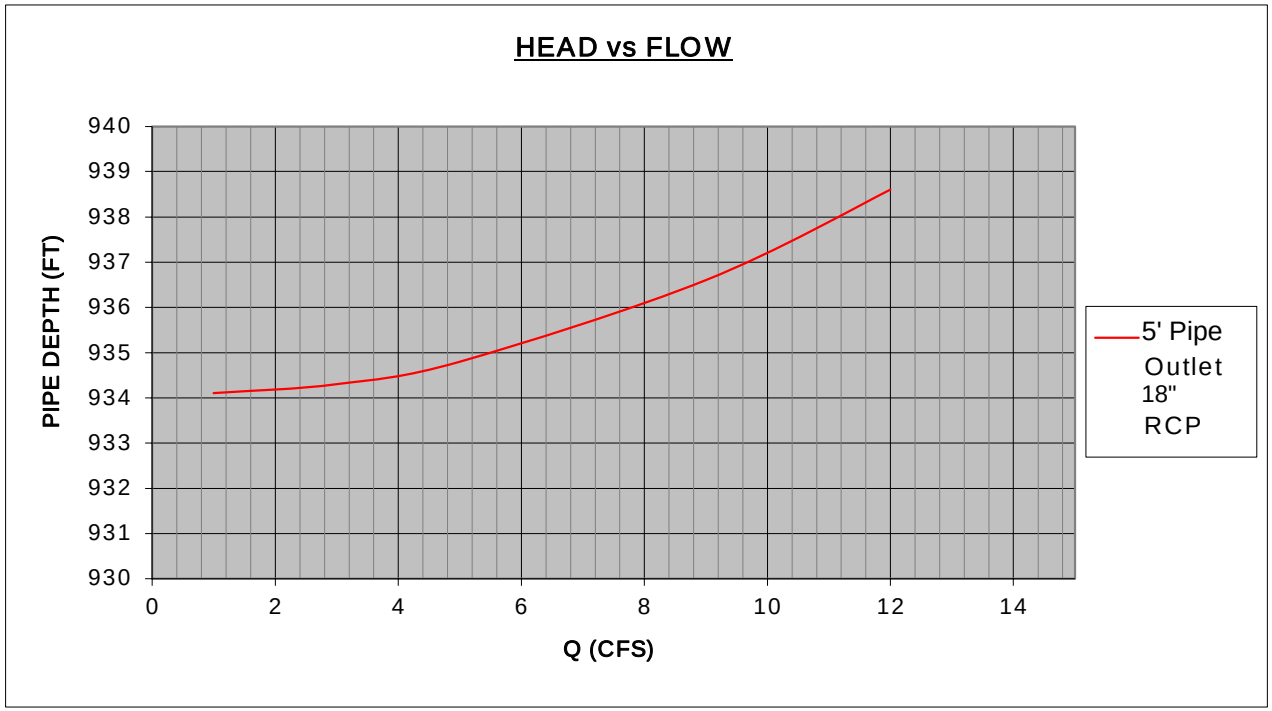
DYO32851 Conco, Fontana
Detention Chamber System-1
Fontana, CA
DETENTION SYSTEM

| PROJECT No.: | SEQ. No.: | DATE: |
|---|---|---|
| 22258 | 32851 | 6/21/2023 |
| DESIGNED: DYO | DRAWN: DYO | |
| CHECKED: DYO | APPROVED: DYO | |
| SHEET NO.: 1 | | |

C:\EXPORTS\TEMPLATES\CMP_V8.DWG 10/18/2019 10:02 AM

18" RCP

| Q (cfs) | Elev (ft) |
|---|---|
| 1 | 934.1 |
| 3 | 934.3 |
| 5 | 934.8 |
| 9 | 936.6 |
| 12 | 938.6 |



# WSPG-18" Outflow Pipe from Detention Chamber

## Input Data:

```
T1 18" OUTLET WSPG                                                          0
T2 CONCO
T3
SO       .000 927.000  1                          934.000
R     352.000 930.500  1      .013                                .000    .000 0
SH    352.000 930.500  1                          935.500
CD   1  4   1    .000   1.500     .000  .000  .000   .00
Q             1.000   .0
Q             3.000   .0
Q             5.000   .0
Q             9.000   .0
Q            12.000   .0
```

# WSPG Output: 18" Outlet Pipe

FILE: CONC.WSW W S P G W - CIVILDESIGN Version 14.11 PAGE 1

Program Package Serial Number: 7323

WATER SURFACE PROFILE LISTING Date: 6-19-2023 Time: 5:12:11

18" OUTLET WSPG
CONCO

| Station | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/ Dia.-FT | Base Wt or I.D. | ZL | No Wth Prs/Pip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch |
| .000 | 927.000 | 7.000 | 934.000 | 1.00 | .57 | .00 | 934.00 | .00 | .37 | .00 | 1.500 | .000 | .00 | 1 .0 |
| 352.000 | .0099 | | | | | .0001 | .03 | 7.00 | .00 | .31 | .013 | .00 | .00 | PIPE |
| 352.000 | 930.500 | 3.532 | 934.032 | 1.00 | .57 | .00 | 934.04 | .00 | .37 | .00 | 1.500 | .000 | .00 | 1 .0 |

Program Package Serial Number: 7323

WATER SURFACE PROFILE LISTING Date: 6-19-2023 Time: 5:12:11

18" OUTLET WSPG
CONCO

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) / Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 927.000 | 7.000 | 934.000 | 3.00 | 1.70 / .04 / | 934.04 / | .00 / | .66 / | .00 / | 1.500 / | .000 / | .00 / | 1 / .0 |
| 352.000 | .0099 | | | | / .0008 / | .29 / | 7.00 / | .00 / | .55 / | .013 / | .00 / | .00 / | PIPE |
| 352.000 | 930.500 | 3.787 | 934.287 | 3.00 | 1.70 / .04 / | 934.33 / | .00 / | .66 / | .00 / | 1.500 / | .000 / | .00 / | 1 / .0 |

Program Package Serial Number: 7323

WATER SURFACE PROFILE LISTING Date: 6-19-2023 Time: 5:12:11

18" OUTLET WSPG
CONCO

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) / Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 927.000 | 7.000 | 934.000 | 5.00 | 2.83 / .12 / | 934.12 / | .00 / | .86 / | .00 / | 1.500 / | .000 / | .00 / | 1 / .0 |
| 352.000 | .0099 | | | | / .0023 | .80 | 7.00 | .00 | .73 | .013 | .00 | .00 | PIPE |
| 352.000 | 930.500 | 4.298 | 934.798 | 5.00 | 2.83 / .12 / | 934.92 / | .00 / | .86 / | .00 / | 1.500 / | .000 / | .00 / | 1 / .0 |

Program Package Serial Number: 7323

WATER SURFACE PROFILE LISTING Date: 6-19-2023 Time: 5:12:11

18" OUTLET WSPG
CONCO

| Station | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/ Dia.-FT | Base Wt or I.D. | ZL | No Wth Prs/Pip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch |
| .000 | 927.000 | 7.000 | 934.000 | 9.00 | 5.09 | .40 | 934.40 | .00 | 1.16 | .00 | 1.500 | .000 | .00 | 1 .0 |
| 352.000 | .0099 | | | | | .0073 | 2.58 | 7.00 | .00 | 1.07 | .013 | .00 | .00 | PIPE |
| 352.000 | 930.500 | 6.084 | 936.584 | 9.00 | 5.09 | .40 | 936.99 | .00 | 1.16 | .00 | 1.500 | .000 | .00 | 1 .0 |

Program Package Serial Number: 7323

WATER SURFACE PROFILE LISTING Date: 6-19-2023 Time: 5:12:11

18" OUTLET WSPG
CONCO

| Station | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/ Dia.-FT | Base Wt or I.D. | ZL | No Wth Prs/Pip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch |
| .000 | 927.000 | 7.000 | 934.000 | 12.00 | 6.79 | .72 | 934.72 | .00 | 1.31 | .00 | 1.500 | .000 | .00 | 1 .0 |
| 352.000 | .0099 | | | | | .0131 | 4.59 | 7.00 | .00 | 1.50 | .013 | .00 | .00 | PIPE |
| 352.000 | 930.500 | 8.094 | 938.594 | 12.00 | 6.79 | .72 | 939.31 | .00 | 1.31 | .00 | 1.500 | .000 | .00 | 1 .0 |

# Flood Routing Analysis: Developed Condition
# (100 yr Storm Event)

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018
                        Study date: 06/21/23

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


      CHAMBER ROUTING
      CONCO INDUSTRIAL
      100-YR STORM EVENT

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


      Program License Serial Number 6484

      ---------------------------------------------------------------------
      ********************* HYDROGRAPH INFORMATION **********************

                    From study/file name: CON1.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =   294
                    Time interval =    5.0 (Min.)
                    Maximum/Peak flow rate =       23.239 (CFS)
                    Total volume =       3.256 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        0.000 to Point/Station        1.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 294
      Hydrograph time unit =  5.000 (Min.)
      Initial depth in storage basin =   0.00(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.00 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.500      0.170      0.500      0.168        0.172
        3.000      0.390      1.500      0.385        0.395
        4.500      0.680      4.300      0.665        0.695
        6.000      0.900      8.000      0.872        0.928
        6.700      0.960      8.700      0.930        0.990
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0       5.8   11.62   17.43   23.24 (Ft.)
 0.083    0.03    0.00      0.000  O       |       |       |       |     0.00
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0.167 | 0.21 | 0.00 | 0.001 | O | | | | 0.01 |
| 0.250 | 0.49 | 0.01 | 0.003 | O | | | | 0.03 |
| 0.333 | 0.63 | 0.02 | 0.007 | O | | | | 0.06 |
| 0.417 | 0.68 | 0.03 | 0.011 | O | | | | 0.10 |
| 0.500 | 0.70 | 0.05 | 0.016 | O | | | | 0.14 |
| 0.583 | 0.71 | 0.06 | 0.020 | O | | | | 0.18 |
| 0.667 | 0.71 | 0.07 | 0.025 | O | | | | 0.22 |
| 0.750 | 0.71 | 0.09 | 0.029 | O | | | | 0.26 |
| 0.833 | 0.71 | 0.10 | 0.033 | O | | | | 0.29 |
| 0.917 | 0.71 | 0.11 | 0.038 | O | | | | 0.33 |
| 1.000 | 0.72 | 0.12 | 0.042 | O | | | | 0.37 |
| 1.083 | 0.72 | 0.13 | 0.046 | O | | | | 0.40 |
| 1.167 | 0.72 | 0.15 | 0.050 | O | | | | 0.44 |
| 1.250 | 0.72 | 0.16 | 0.054 | O | | | | 0.47 |
| 1.333 | 0.73 | 0.17 | 0.058 | O | | | | 0.51 |
| 1.417 | 0.73 | 0.18 | 0.061 | OI | | | | 0.54 |
| 1.500 | 0.73 | 0.19 | 0.065 | OI | | | | 0.57 |
| 1.583 | 0.73 | 0.20 | 0.069 | OI | | | | 0.61 |
| 1.667 | 0.73 | 0.21 | 0.072 | OI | | | | 0.64 |
| 1.750 | 0.74 | 0.22 | 0.076 | OI | | | | 0.67 |
| 1.833 | 0.74 | 0.23 | 0.079 | OI | | | | 0.70 |
| 1.917 | 0.74 | 0.24 | 0.083 | OI | | | | 0.73 |
| 2.000 | 0.74 | 0.25 | 0.086 | OI | | | | 0.76 |
| 2.083 | 0.75 | 0.26 | 0.090 | OI | | | | 0.79 |
| 2.167 | 0.75 | 0.27 | 0.093 | OI | | | | 0.82 |
| 2.250 | 0.75 | 0.28 | 0.096 | OI | | | | 0.85 |
| 2.333 | 0.75 | 0.29 | 0.099 | OI | | | | 0.88 |
| 2.417 | 0.76 | 0.30 | 0.103 | OI | | | | 0.91 |
| 2.500 | 0.76 | 0.31 | 0.106 | OI | | | | 0.93 |
| 2.583 | 0.76 | 0.32 | 0.109 | OI | | | | 0.96 |
| 2.667 | 0.77 | 0.33 | 0.112 | OI | | | | 0.99 |
| 2.750 | 0.77 | 0.34 | 0.115 | OI | | | | 1.01 |
| 2.833 | 0.77 | 0.35 | 0.118 | OI | | | | 1.04 |
| 2.917 | 0.77 | 0.35 | 0.121 | OI | | | | 1.06 |
| 3.000 | 0.78 | 0.36 | 0.124 | OI | | | | 1.09 |
| 3.083 | 0.78 | 0.37 | 0.126 | OI | | | | 1.11 |
| 3.167 | 0.78 | 0.38 | 0.129 | OI | | | | 1.14 |
| 3.250 | 0.78 | 0.39 | 0.132 | OI | | | | 1.16 |
| 3.333 | 0.79 | 0.40 | 0.135 | OI | | | | 1.19 |
| 3.417 | 0.79 | 0.40 | 0.137 | OI | | | | 1.21 |
| 3.500 | 0.79 | 0.41 | 0.140 | OI | | | | 1.23 |
| 3.583 | 0.80 | 0.42 | 0.143 | OI | | | | 1.26 |
| 3.667 | 0.80 | 0.43 | 0.145 | OI | | | | 1.28 |
| 3.750 | 0.80 | 0.43 | 0.148 | OI | | | | 1.30 |
| 3.833 | 0.81 | 0.44 | 0.150 | OI | | | | 1.33 |
| 3.917 | 0.81 | 0.45 | 0.153 | OI | | | | 1.35 |
| 4.000 | 0.81 | 0.46 | 0.155 | OI | | | | 1.37 |
| 4.083 | 0.81 | 0.46 | 0.158 | OI | | | | 1.39 |
| 4.167 | 0.82 | 0.47 | 0.160 | OI | | | | 1.41 |
| 4.250 | 0.82 | 0.48 | 0.162 | OI | | | | 1.43 |
| 4.333 | 0.82 | 0.48 | 0.165 | OI | | | | 1.45 |
| 4.417 | 0.83 | 0.49 | 0.167 | OI | | | | 1.47 |
| 4.500 | 0.83 | 0.50 | 0.169 | OI | | | | 1.49 |
| 4.583 | 0.83 | 0.51 | 0.172 | OI | | | | 1.51 |
| 4.667 | 0.84 | 0.52 | 0.174 | OI | | | | 1.53 |
| 4.750 | 0.84 | 0.53 | 0.176 | OI | | | | 1.54 |
| 4.833 | 0.84 | 0.54 | 0.178 | OI | | | | 1.56 |
| 4.917 | 0.85 | 0.55 | 0.180 | OI | | | | 1.57 |
| 5.000 | 0.85 | 0.56 | 0.182 | OI | | | | 1.58 |
| 5.083 | 0.86 | 0.57 | 0.184 | OI | | | | 1.60 |
| 5.167 | 0.86 | 0.57 | 0.186 | OI | | | | 1.61 |
| 5.250 | 0.86 | 0.58 | 0.188 | OI | | | | 1.62 |
| 5.333 | 0.87 | 0.59 | 0.190 | OI | | | | 1.64 |
| 5.417 | 0.87 | 0.60 | 0.192 | OI | | | | 1.65 |
| 5.500 | 0.87 | 0.61 | 0.194 | OI | | | | 1.66 |
| 5.583 | 0.88 | 0.62 | 0.196 | OI | | | | 1.68 |
| 5.667 | 0.88 | 0.63 | 0.198 | OI | | | | 1.69 |
| 5.750 | 0.89 | 0.63 | 0.199 | OI | | | | 1.70 |
| 5.833 | 0.89 | 0.64 | 0.201 | OI | | | | 1.71 |
| 5.917 | 0.89 | 0.65 | 0.203 | OI | | | | 1.72 |
| 6.000 | 0.90 | 0.66 | 0.204 | OI | | | | 1.73 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.083 | 0.90 | 0.66 | 0.206 | OI | | | | | 1.75 |
| 6.167 | 0.91 | 0.67 | 0.208 | OI | | | | | 1.76 |
| 6.250 | 0.91 | 0.68 | 0.209 | OI | | | | | 1.77 |
| 6.333 | 0.92 | 0.69 | 0.211 | OI | | | | | 1.78 |
| 6.417 | 0.92 | 0.69 | 0.212 | OI | | | | | 1.79 |
| 6.500 | 0.92 | 0.70 | 0.214 | OI | | | | | 1.80 |
| 6.583 | 0.93 | 0.71 | 0.216 | OI | | | | | 1.81 |
| 6.667 | 0.93 | 0.71 | 0.217 | OI | | | | | 1.82 |
| 6.750 | 0.94 | 0.72 | 0.219 | OI | | | | | 1.83 |
| 6.833 | 0.94 | 0.73 | 0.220 | \|O | | | | | 1.84 |
| 6.917 | 0.95 | 0.73 | 0.222 | \|O | | | | | 1.85 |
| 7.000 | 0.95 | 0.74 | 0.223 | \|O | | | | | 1.86 |
| 7.083 | 0.96 | 0.75 | 0.224 | \|O | | | | | 1.87 |
| 7.167 | 0.96 | 0.75 | 0.226 | \|O | | | | | 1.88 |
| 7.250 | 0.97 | 0.76 | 0.227 | \|O | | | | | 1.89 |
| 7.333 | 0.97 | 0.77 | 0.229 | \|O | | | | | 1.90 |
| 7.417 | 0.98 | 0.77 | 0.230 | \|O | | | | | 1.91 |
| 7.500 | 0.98 | 0.78 | 0.232 | \|O | | | | | 1.92 |
| 7.583 | 0.99 | 0.79 | 0.233 | \|O | | | | | 1.93 |
| 7.667 | 0.99 | 0.79 | 0.234 | \|O | | | | | 1.94 |
| 7.750 | 1.00 | 0.80 | 0.236 | \|O | | | | | 1.95 |
| 7.833 | 1.00 | 0.80 | 0.237 | \|O | | | | | 1.96 |
| 7.917 | 1.01 | 0.81 | 0.238 | \|O | | | | | 1.97 |
| 8.000 | 1.02 | 0.82 | 0.240 | \|O | | | | | 1.98 |
| 8.083 | 1.02 | 0.82 | 0.241 | \|O | | | | | 1.99 |
| 8.167 | 1.03 | 0.83 | 0.243 | \|O | | | | | 1.99 |
| 8.250 | 1.03 | 0.84 | 0.244 | \|O | | | | | 2.00 |
| 8.333 | 1.04 | 0.84 | 0.245 | \|O | | | | | 2.01 |
| 8.417 | 1.05 | 0.85 | 0.247 | \|O | | | | | 2.02 |
| 8.500 | 1.05 | 0.85 | 0.248 | \|O | | | | | 2.03 |
| 8.583 | 1.06 | 0.86 | 0.249 | \|O | | | | | 2.04 |
| 8.667 | 1.07 | 0.87 | 0.251 | \|O | | | | | 2.05 |
| 8.750 | 1.07 | 0.87 | 0.252 | \|O | | | | | 2.06 |
| 8.833 | 1.08 | 0.88 | 0.254 | \|O | | | | | 2.07 |
| 8.917 | 1.09 | 0.89 | 0.255 | \|O | | | | | 2.08 |
| 9.000 | 1.09 | 0.89 | 0.256 | \|O | | | | | 2.09 |
| 9.083 | 1.10 | 0.90 | 0.258 | \|O | | | | | 2.10 |
| 9.167 | 1.11 | 0.90 | 0.259 | \|O | | | | | 2.11 |
| 9.250 | 1.12 | 0.91 | 0.261 | \|O | | | | | 2.12 |
| 9.333 | 1.12 | 0.92 | 0.262 | \|O | | | | | 2.13 |
| 9.417 | 1.13 | 0.92 | 0.263 | \|O | | | | | 2.14 |
| 9.500 | 1.14 | 0.93 | 0.265 | \|O | | | | | 2.15 |
| 9.583 | 1.15 | 0.94 | 0.266 | \|O | | | | | 2.16 |
| 9.667 | 1.16 | 0.94 | 0.268 | \|O | | | | | 2.17 |
| 9.750 | 1.16 | 0.95 | 0.269 | \|O | | | | | 2.18 |
| 9.833 | 1.17 | 0.96 | 0.271 | \|O | | | | | 2.19 |
| 9.917 | 1.18 | 0.96 | 0.272 | \|O | | | | | 2.20 |
| 10.000 | 1.19 | 0.97 | 0.274 | \|O | | | | | 2.21 |
| 10.083 | 1.20 | 0.98 | 0.275 | \|O | | | | | 2.22 |
| 10.167 | 1.21 | 0.98 | 0.277 | \|O | | | | | 2.23 |
| 10.250 | 1.22 | 0.99 | 0.278 | \|O | | | | | 2.24 |
| 10.333 | 1.23 | 1.00 | 0.280 | \|O | | | | | 2.25 |
| 10.417 | 1.24 | 1.01 | 0.281 | \|O | | | | | 2.26 |
| 10.500 | 1.25 | 1.01 | 0.283 | \|O | | | | | 2.27 |
| 10.583 | 1.26 | 1.02 | 0.285 | \|O | | | | | 2.28 |
| 10.667 | 1.27 | 1.03 | 0.286 | \|O | | | | | 2.29 |
| 10.750 | 1.28 | 1.04 | 0.288 | \|O | | | | | 2.30 |
| 10.833 | 1.29 | 1.04 | 0.290 | \|O | | | | | 2.32 |
| 10.917 | 1.30 | 1.05 | 0.291 | \|O | | | | | 2.33 |
| 11.000 | 1.31 | 1.06 | 0.293 | \|O | | | | | 2.34 |
| 11.083 | 1.33 | 1.07 | 0.295 | \|O | | | | | 2.35 |
| 11.167 | 1.34 | 1.08 | 0.297 | \|O | | | | | 2.36 |
| 11.250 | 1.35 | 1.08 | 0.299 | \|O | | | | | 2.38 |
| 11.333 | 1.36 | 1.09 | 0.300 | \|O | | | | | 2.39 |
| 11.417 | 1.38 | 1.10 | 0.302 | \|O | | | | | 2.40 |
| 11.500 | 1.39 | 1.11 | 0.304 | \|O | | | | | 2.41 |
| 11.583 | 1.41 | 1.12 | 0.306 | \|O | | | | | 2.43 |
| 11.667 | 1.42 | 1.13 | 0.308 | \|O | | | | | 2.44 |
| 11.750 | 1.44 | 1.14 | 0.310 | \|O | | | | | 2.46 |
| 11.833 | 1.45 | 1.15 | 0.312 | \|O | | | | | 2.47 |
| 11.917 | 1.47 | 1.16 | 0.314 | \|OI | | | | | 2.48 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 12.000 | 1.48 | 1.17 | 0.317 | OI | | | | | 2.50 |
| 12.083 | 1.51 | 1.18 | 0.319 | OI | | | | | 2.51 |
| 12.167 | 1.58 | 1.19 | 0.321 | OI | | | | | 2.53 |
| 12.250 | 1.68 | 1.20 | 0.324 | OI | | | | | 2.55 |
| 12.333 | 1.74 | 1.22 | 0.328 | OI | | | | | 2.58 |
| 12.417 | 1.78 | 1.23 | 0.331 | OI | | | | | 2.60 |
| 12.500 | 1.80 | 1.25 | 0.335 | OI | | | | | 2.63 |
| 12.583 | 1.82 | 1.27 | 0.339 | OI | | | | | 2.65 |
| 12.667 | 1.85 | 1.29 | 0.343 | OI | | | | | 2.68 |
| 12.750 | 1.87 | 1.30 | 0.347 | OI | | | | | 2.71 |
| 12.833 | 1.89 | 1.32 | 0.351 | OI | | | | | 2.73 |
| 12.917 | 1.92 | 1.34 | 0.355 | OI | | | | | 2.76 |
| 13.000 | 1.94 | 1.36 | 0.359 | OI | | | | | 2.79 |
| 13.083 | 1.97 | 1.38 | 0.363 | OI | | | | | 2.81 |
| 13.167 | 1.99 | 1.39 | 0.367 | OI | | | | | 2.84 |
| 13.250 | 2.02 | 1.41 | 0.371 | OI | | | | | 2.87 |
| 13.333 | 2.05 | 1.43 | 0.375 | OI | | | | | 2.90 |
| 13.417 | 2.08 | 1.45 | 0.379 | OI | | | | | 2.93 |
| 13.500 | 2.11 | 1.47 | 0.384 | O | | | | | 2.96 |
| 13.583 | 2.15 | 1.49 | 0.388 | O | | | | | 2.99 |
| 13.667 | 2.18 | 1.53 | 0.393 | OI | | | | | 3.01 |
| 13.750 | 2.22 | 1.57 | 0.397 | OI | | | | | 3.04 |
| 13.833 | 2.26 | 1.61 | 0.402 | OI | | | | | 3.06 |
| 13.917 | 2.30 | 1.66 | 0.406 | OI | | | | | 3.08 |
| 14.000 | 2.34 | 1.70 | 0.411 | OI | | | | | 3.11 |
| 14.083 | 2.39 | 1.74 | 0.415 | OI | | | | | 3.13 |
| 14.167 | 2.44 | 1.78 | 0.419 | OI | | | | | 3.15 |
| 14.250 | 2.49 | 1.83 | 0.424 | OI | | | | | 3.18 |
| 14.333 | 2.54 | 1.87 | 0.429 | OI | | | | | 3.20 |
| 14.417 | 2.60 | 1.92 | 0.433 | OI | | | | | 3.22 |
| 14.500 | 2.67 | 1.96 | 0.438 | OI | | | | | 3.25 |
| 14.583 | 2.73 | 2.01 | 0.443 | OI | | | | | 3.27 |
| 14.667 | 2.81 | 2.06 | 0.448 | OI | | | | | 3.30 |
| 14.750 | 2.89 | 2.11 | 0.453 | OI | | | | | 3.33 |
| 14.833 | 2.97 | 2.16 | 0.459 | O I | | | | | 3.36 |
| 14.917 | 3.07 | 2.22 | 0.464 | OI | | | | | 3.38 |
| 15.000 | 3.17 | 2.28 | 0.470 | OI | | | | | 3.42 |
| 15.083 | 3.29 | 2.34 | 0.477 | OI | | | | | 3.45 |
| 15.167 | 3.41 | 2.40 | 0.484 | OI | | | | | 3.48 |
| 15.250 | 3.56 | 2.47 | 0.491 | OI | | | | | 3.52 |
| 15.333 | 3.72 | 2.55 | 0.499 | O I | | | | | 3.56 |
| 15.417 | 3.88 | 2.63 | 0.507 | O I | | | | | 3.60 |
| 15.500 | 3.89 | 2.71 | 0.515 | O I | | | | | 3.65 |
| 15.583 | 3.84 | 2.78 | 0.523 | O I | | | | | 3.69 |
| 15.667 | 3.99 | 2.86 | 0.531 | O I | | | | | 3.73 |
| 15.750 | 4.36 | 2.94 | 0.539 | O I | | | | | 3.77 |
| 15.833 | 4.94 | 3.05 | 0.551 | O I | | | | | 3.83 |
| 15.917 | 5.84 | 3.20 | 0.566 | O I | | | | | 3.91 |
| 16.000 | 7.42 | 3.42 | 0.589 | O I | | | | | 4.03 |
| 16.083 | 11.35 | 3.81 | 0.629 | O | I | | | | 4.24 |
| 16.167 | 19.79 | 4.75 | 0.707 | O | | | I | | 4.68 |
| 16.250 | 23.24 | 6.58 | 0.816 | O | | | | I | 5.43 |
| 16.333 | 14.81 | 7.95 | 0.897 | O | I | | | | 5.98 |
| 16.417 | 8.18 | 8.24 | 0.920 | O | | | | | 6.24 |
| 16.500 | 5.34 | 8.12 | 0.910 | I | O | | | | 6.12 |
| 16.583 | 4.65 | 7.83 | 0.890 | I | O | | | | 5.93 |
| 16.667 | 3.88 | 7.44 | 0.867 | I | O | | | | 5.77 |
| 16.750 | 3.55 | 7.03 | 0.842 | I | O | | | | 5.61 |
| 16.833 | 3.27 | 6.64 | 0.819 | I | O | | | | 5.45 |
| 16.917 | 3.06 | 6.26 | 0.796 | I | O | | | | 5.29 |
| 17.000 | 2.88 | 5.90 | 0.775 | I | O | | | | 5.15 |
| 17.083 | 2.73 | 5.56 | 0.755 | I | O | | | | 5.01 |
| 17.167 | 2.60 | 5.24 | 0.736 | I | O | | | | 4.88 |
| 17.250 | 2.48 | 4.94 | 0.718 | I | O | | | | 4.76 |
| 17.333 | 2.38 | 4.67 | 0.702 | I | O | | | | 4.65 |
| 17.417 | 2.29 | 4.41 | 0.687 | I | O | | | | 4.55 |
| 17.500 | 2.21 | 4.23 | 0.673 | I | O | | | | 4.46 |
| 17.583 | 2.14 | 4.10 | 0.659 | I | O | | | | 4.39 |
| 17.667 | 2.08 | 3.97 | 0.646 | I | O | | | | 4.32 |
| 17.750 | 2.02 | 3.84 | 0.633 | I | O | | | | 4.26 |
| 17.833 | 1.96 | 3.72 | 0.620 | I | O | | | | 4.19 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 17.917 | 1.91 | 3.61 | 0.609 | \| I O | \| | \| | \| | 4.13 |
| 18.000 | 1.86 | 3.50 | 0.597 | \| I O | \| | \| | \| | 4.07 |
| 18.083 | 1.81 | 3.39 | 0.586 | \| I O | \| | \| | \| | 4.01 |
| 18.167 | 1.71 | 3.29 | 0.575 | \| I O | \| | \| | \| | 3.96 |
| 18.250 | 1.59 | 3.18 | 0.564 | \| I O | \| | \| | \| | 3.90 |
| 18.333 | 1.52 | 3.08 | 0.553 | \| I O | \| | \| | \| | 3.85 |
| 18.417 | 1.47 | 2.98 | 0.543 | \| I O | \| | \| | \| | 3.79 |
| 18.500 | 1.43 | 2.88 | 0.533 | \|I O | \| | \| | \| | 3.74 |
| 18.583 | 1.40 | 2.78 | 0.523 | \|I O | \| | \| | \| | 3.69 |
| 18.667 | 1.38 | 2.69 | 0.514 | \|I O | \| | \| | \| | 3.64 |
| 18.750 | 1.35 | 2.61 | 0.505 | \|I O | \| | \| | \| | 3.59 |
| 18.833 | 1.32 | 2.53 | 0.496 | \|I O | \| | \| | \| | 3.55 |
| 18.917 | 1.30 | 2.45 | 0.488 | \|I O | \| | \| | \| | 3.51 |
| 19.000 | 1.28 | 2.37 | 0.480 | \|I O | \| | \| | \| | 3.47 |
| 19.083 | 1.26 | 2.30 | 0.473 | \|I O | \| | \| | \| | 3.43 |
| 19.167 | 1.24 | 2.23 | 0.466 | \|I O | \| | \| | \| | 3.39 |
| 19.250 | 1.22 | 2.17 | 0.459 | \|IO | \| | \| | \| | 3.36 |
| 19.333 | 1.20 | 2.11 | 0.453 | \|IO | \| | \| | \| | 3.33 |
| 19.417 | 1.18 | 2.05 | 0.447 | \|IO | \| | \| | \| | 3.29 |
| 19.500 | 1.16 | 1.99 | 0.441 | \|IO | \| | \| | \| | 3.26 |
| 19.583 | 1.15 | 1.94 | 0.435 | \|IO | \| | \| | \| | 3.23 |
| 19.667 | 1.13 | 1.89 | 0.430 | \|IO | \| | \| | \| | 3.21 |
| 19.750 | 1.11 | 1.84 | 0.425 | \|IO | \| | \| | \| | 3.18 |
| 19.833 | 1.10 | 1.79 | 0.420 | \|IO | \| | \| | \| | 3.16 |
| 19.917 | 1.09 | 1.75 | 0.415 | \|IO | \| | \| | \| | 3.13 |
| 20.000 | 1.07 | 1.70 | 0.411 | \|IO | \| | \| | \| | 3.11 |
| 20.083 | 1.06 | 1.66 | 0.407 | \|IO | \| | \| | \| | 3.09 |
| 20.167 | 1.05 | 1.62 | 0.403 | \|IO | \| | \| | \| | 3.07 |
| 20.250 | 1.03 | 1.58 | 0.399 | \|IO | \| | \| | \| | 3.05 |
| 20.333 | 1.02 | 1.55 | 0.395 | \|IO | \| | \| | \| | 3.03 |
| 20.417 | 1.01 | 1.51 | 0.392 | \|IO | \| | \| | \| | 3.01 |
| 20.500 | 1.00 | 1.49 | 0.388 | \|IO | \| | \| | \| | 2.99 |
| 20.583 | 0.99 | 1.48 | 0.385 | \|IO | \| | \| | \| | 2.96 |
| 20.667 | 0.98 | 1.46 | 0.381 | \|IO | \| | \| | \| | 2.94 |
| 20.750 | 0.97 | 1.45 | 0.378 | \|O | \| | \| | \| | 2.92 |
| 20.833 | 0.96 | 1.43 | 0.375 | \|O | \| | \| | \| | 2.90 |
| 20.917 | 0.95 | 1.42 | 0.371 | \|O | \| | \| | \| | 2.87 |
| 21.000 | 0.94 | 1.40 | 0.368 | \|O | \| | \| | \| | 2.85 |
| 21.083 | 0.93 | 1.39 | 0.365 | \|O | \| | \| | \| | 2.83 |
| 21.167 | 0.92 | 1.37 | 0.362 | \|O | \| | \| | \| | 2.81 |
| 21.250 | 0.91 | 1.36 | 0.359 | \|O | \| | \| | \| | 2.79 |
| 21.333 | 0.90 | 1.34 | 0.356 | \|O | \| | \| | \| | 2.77 |
| 21.417 | 0.89 | 1.33 | 0.353 | \|O | \| | \| | \| | 2.75 |
| 21.500 | 0.89 | 1.32 | 0.350 | \|O | \| | \| | \| | 2.73 |
| 21.583 | 0.88 | 1.30 | 0.347 | \|O | \| | \| | \| | 2.71 |
| 21.667 | 0.87 | 1.29 | 0.344 | \|O | \| | \| | \| | 2.69 |
| 21.750 | 0.86 | 1.28 | 0.341 | \|O | \| | \| | \| | 2.67 |
| 21.833 | 0.85 | 1.26 | 0.338 | \|O | \| | \| | \| | 2.65 |
| 21.917 | 0.85 | 1.25 | 0.335 | \|O | \| | \| | \| | 2.63 |
| 22.000 | 0.84 | 1.24 | 0.333 | \|O | \| | \| | \| | 2.61 |
| 22.083 | 0.83 | 1.23 | 0.330 | \|O | \| | \| | \| | 2.59 |
| 22.167 | 0.83 | 1.21 | 0.327 | \|O | \| | \| | \| | 2.57 |
| 22.250 | 0.82 | 1.20 | 0.325 | \|O | \| | \| | \| | 2.55 |
| 22.333 | 0.81 | 1.19 | 0.322 | \|O | \| | \| | \| | 2.54 |
| 22.417 | 0.81 | 1.18 | 0.319 | \|O | \| | \| | \| | 2.52 |
| 22.500 | 0.80 | 1.17 | 0.317 | \|O | \| | \| | \| | 2.50 |
| 22.583 | 0.80 | 1.16 | 0.314 | \|O | \| | \| | \| | 2.48 |
| 22.667 | 0.79 | 1.14 | 0.312 | \|O | \| | \| | \| | 2.47 |
| 22.750 | 0.78 | 1.13 | 0.309 | \|O | \| | \| | \| | 2.45 |
| 22.833 | 0.78 | 1.12 | 0.307 | \|O | \| | \| | \| | 2.43 |
| 22.917 | 0.77 | 1.11 | 0.305 | \|O | \| | \| | \| | 2.42 |
| 23.000 | 0.77 | 1.10 | 0.302 | \|O | \| | \| | \| | 2.40 |
| 23.083 | 0.76 | 1.09 | 0.300 | \|O | \| | \| | \| | 2.39 |
| 23.167 | 0.76 | 1.08 | 0.298 | \|O | \| | \| | \| | 2.37 |
| 23.250 | 0.75 | 1.07 | 0.296 | \|O | \| | \| | \| | 2.36 |
| 23.333 | 0.75 | 1.06 | 0.293 | \|O | \| | \| | \| | 2.34 |
| 23.417 | 0.74 | 1.05 | 0.291 | \|O | \| | \| | \| | 2.33 |
| 23.500 | 0.74 | 1.04 | 0.289 | \|O | \| | \| | \| | 2.31 |
| 23.583 | 0.73 | 1.03 | 0.287 | \|O | \| | \| | \| | 2.30 |
| 23.667 | 0.73 | 1.02 | 0.285 | \|O | \| | \| | \| | 2.28 |
| 23.750 | 0.72 | 1.01 | 0.283 | IO | \| | \| | \| | 2.27 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 23.833 | 0.72 | 1.00 | 0.281 | IO | | | | 2.26 |
| 23.917 | 0.71 | 1.00 | 0.279 | IO | | | | 2.24 |
| 24.000 | 0.71 | 0.99 | 0.277 | IO | | | | 2.23 |
| 24.083 | 0.67 | 0.98 | 0.275 | IO | | | | 2.22 |
| 24.167 | 0.49 | 0.97 | 0.272 | IO | | | | 2.20 |
| 24.250 | 0.21 | 0.95 | 0.268 | IO | | | | 2.17 |
| 24.333 | 0.07 | 0.92 | 0.263 | IO | | | | 2.13 |
| 24.417 | 0.02 | 0.89 | 0.257 | IO | | | | 2.09 |
| 24.500 | 0.01 | 0.87 | 0.251 | IO | | | | 2.05 |
| 24.583 | 0.00 | 0.84 | 0.245 | IO | | | | 2.01 |
| 24.667 | 0.00 | 0.81 | 0.239 | IO | | | | 1.97 |
| 24.750 | 0.00 | 0.79 | 0.234 | IO | | | | 1.93 |
| 24.833 | 0.00 | 0.77 | 0.228 | IO | | | | 1.90 |
| 24.917 | 0.00 | 0.74 | 0.223 | IO | | | | 1.86 |
| 25.000 | 0.00 | 0.72 | 0.218 | O | | | | 1.83 |
| 25.083 | 0.00 | 0.70 | 0.213 | O | | | | 1.80 |
| 25.167 | 0.00 | 0.68 | 0.209 | O | | | | 1.76 |
| 25.250 | 0.00 | 0.65 | 0.204 | O | | | | 1.73 |
| 25.333 | 0.00 | 0.63 | 0.200 | O | | | | 1.70 |
| 25.417 | 0.00 | 0.61 | 0.195 | O | | | | 1.67 |
| 25.500 | 0.00 | 0.60 | 0.191 | O | | | | 1.64 |
| 25.583 | 0.00 | 0.58 | 0.187 | O | | | | 1.62 |
| 25.667 | 0.00 | 0.56 | 0.183 | O | | | | 1.59 |
| 25.750 | 0.00 | 0.54 | 0.179 | O | | | | 1.56 |
| 25.833 | 0.00 | 0.53 | 0.176 | O | | | | 1.54 |
| 25.917 | 0.00 | 0.51 | 0.172 | O | | | | 1.51 |
| 26.000 | 0.00 | 0.50 | 0.169 | O | | | | 1.49 |
| 26.083 | 0.00 | 0.49 | 0.165 | O | | | | 1.46 |
| 26.167 | 0.00 | 0.48 | 0.162 | O | | | | 1.43 |
| 26.250 | 0.00 | 0.47 | 0.159 | O | | | | 1.40 |
| 26.333 | 0.00 | 0.46 | 0.155 | O | | | | 1.37 |
| 26.417 | 0.00 | 0.45 | 0.152 | O | | | | 1.34 |
| 26.500 | 0.00 | 0.44 | 0.149 | O | | | | 1.32 |
| 26.583 | 0.00 | 0.43 | 0.146 | O | | | | 1.29 |
| 26.667 | 0.00 | 0.42 | 0.143 | O | | | | 1.27 |
| 26.750 | 0.00 | 0.41 | 0.141 | O | | | | 1.24 |
| 26.833 | 0.00 | 0.41 | 0.138 | O | | | | 1.22 |
| 26.917 | 0.00 | 0.40 | 0.135 | O | | | | 1.19 |
| 27.000 | 0.00 | 0.39 | 0.132 | O | | | | 1.17 |
| 27.083 | 0.00 | 0.38 | 0.130 | O | | | | 1.14 |
| 27.167 | 0.00 | 0.37 | 0.127 | O | | | | 1.12 |
| 27.250 | 0.00 | 0.37 | 0.124 | O | | | | 1.10 |
| 27.333 | 0.00 | 0.36 | 0.122 | O | | | | 1.08 |
| 27.417 | 0.00 | 0.35 | 0.119 | O | | | | 1.05 |
| 27.500 | 0.00 | 0.34 | 0.117 | O | | | | 1.03 |
| 27.583 | 0.00 | 0.34 | 0.115 | O | | | | 1.01 |
| 27.667 | 0.00 | 0.33 | 0.112 | O | | | | 0.99 |
| 27.750 | 0.00 | 0.32 | 0.110 | O | | | | 0.97 |
| 27.833 | 0.00 | 0.32 | 0.108 | O | | | | 0.95 |
| 27.917 | 0.00 | 0.31 | 0.106 | O | | | | 0.93 |
| 28.000 | 0.00 | 0.31 | 0.104 | O | | | | 0.92 |
| 28.083 | 0.00 | 0.30 | 0.102 | O | | | | 0.90 |
| 28.167 | 0.00 | 0.29 | 0.100 | O | | | | 0.88 |
| 28.250 | 0.00 | 0.29 | 0.098 | O | | | | 0.86 |
| 28.333 | 0.00 | 0.28 | 0.096 | O | | | | 0.84 |
| 28.417 | 0.00 | 0.28 | 0.094 | O | | | | 0.83 |
| 28.500 | 0.00 | 0.27 | 0.092 | O | | | | 0.81 |
| 28.583 | 0.00 | 0.26 | 0.090 | O | | | | 0.79 |
| 28.667 | 0.00 | 0.26 | 0.088 | O | | | | 0.78 |
| 28.750 | 0.00 | 0.25 | 0.086 | O | | | | 0.76 |
| 28.833 | 0.00 | 0.25 | 0.085 | O | | | | 0.75 |
| 28.917 | 0.00 | 0.24 | 0.083 | O | | | | 0.73 |
| 29.000 | 0.00 | 0.24 | 0.081 | O | | | | 0.72 |
| 29.083 | 0.00 | 0.23 | 0.080 | O | | | | 0.70 |
| 29.167 | 0.00 | 0.23 | 0.078 | O | | | | 0.69 |
| 29.250 | 0.00 | 0.23 | 0.077 | O | | | | 0.68 |
| 29.333 | 0.00 | 0.22 | 0.075 | O | | | | 0.66 |
| 29.417 | 0.00 | 0.22 | 0.073 | O | | | | 0.65 |
| 29.500 | 0.00 | 0.21 | 0.072 | O | | | | 0.64 |
| 29.583 | 0.00 | 0.21 | 0.071 | O | | | | 0.62 |
| 29.667 | 0.00 | 0.20 | 0.069 | O | | | | 0.61 |

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|---|---|---|---|---|---|---|---|---|---|
| 29.750 | 0.00 | 0.20 | 0.068 | O | \| | \| | \| | \| | 0.60 |
| 29.833 | 0.00 | 0.20 | 0.066 | O | \| | \| | \| | \| | 0.59 |
| 29.917 | 0.00 | 0.19 | 0.065 | O | \| | \| | \| | \| | 0.57 |
| 30.000 | 0.00 | 0.19 | 0.064 | O | \| | \| | \| | \| | 0.56 |
| 30.083 | 0.00 | 0.18 | 0.062 | O | \| | \| | \| | \| | 0.55 |
| 30.167 | 0.00 | 0.18 | 0.061 | O | \| | \| | \| | \| | 0.54 |
| 30.250 | 0.00 | 0.18 | 0.060 | O | \| | \| | \| | \| | 0.53 |
| 30.333 | 0.00 | 0.17 | 0.059 | O | \| | \| | \| | \| | 0.52 |
| 30.417 | 0.00 | 0.17 | 0.058 | O | \| | \| | \| | \| | 0.51 |
| 30.500 | 0.00 | 0.17 | 0.056 | O | \| | \| | \| | \| | 0.50 |
| 30.583 | 0.00 | 0.16 | 0.055 | O | \| | \| | \| | \| | 0.49 |
| 30.667 | 0.00 | 0.16 | 0.054 | O | \| | \| | \| | \| | 0.48 |
| 30.750 | 0.00 | 0.16 | 0.053 | O | \| | \| | \| | \| | 0.47 |
| 30.833 | 0.00 | 0.15 | 0.052 | O | \| | \| | \| | \| | 0.46 |
| 30.917 | 0.00 | 0.15 | 0.051 | O | \| | \| | \| | \| | 0.45 |
| 31.000 | 0.00 | 0.15 | 0.050 | O | \| | \| | \| | \| | 0.44 |
| 31.083 | 0.00 | 0.14 | 0.049 | O | \| | \| | \| | \| | 0.43 |
| 31.167 | 0.00 | 0.14 | 0.048 | O | \| | \| | \| | \| | 0.42 |
| 31.250 | 0.00 | 0.14 | 0.047 | O | \| | \| | \| | \| | 0.42 |
| 31.333 | 0.00 | 0.14 | 0.046 | O | \| | \| | \| | \| | 0.41 |
| 31.417 | 0.00 | 0.13 | 0.045 | O | \| | \| | \| | \| | 0.40 |
| 31.500 | 0.00 | 0.13 | 0.044 | O | \| | \| | \| | \| | 0.39 |
| 31.583 | 0.00 | 0.13 | 0.043 | O | \| | \| | \| | \| | 0.38 |
| 31.667 | 0.00 | 0.13 | 0.043 | O | \| | \| | \| | \| | 0.38 |
| 31.750 | 0.00 | 0.12 | 0.042 | O | \| | \| | \| | \| | 0.37 |
| 31.833 | 0.00 | 0.12 | 0.041 | O | \| | \| | \| | \| | 0.36 |
| 31.917 | 0.00 | 0.12 | 0.040 | O | \| | \| | \| | \| | 0.35 |
| 32.000 | 0.00 | 0.12 | 0.039 | O | \| | \| | \| | \| | 0.35 |
| 32.083 | 0.00 | 0.11 | 0.038 | O | \| | \| | \| | \| | 0.34 |
| 32.167 | 0.00 | 0.11 | 0.038 | O | \| | \| | \| | \| | 0.33 |
| 32.250 | 0.00 | 0.11 | 0.037 | O | \| | \| | \| | \| | 0.33 |
| 32.333 | 0.00 | 0.11 | 0.036 | O | \| | \| | \| | \| | 0.32 |
| 32.417 | 0.00 | 0.10 | 0.035 | O | \| | \| | \| | \| | 0.31 |
| 32.500 | 0.00 | 0.10 | 0.035 | O | \| | \| | \| | \| | 0.31 |
| 32.583 | 0.00 | 0.10 | 0.034 | O | \| | \| | \| | \| | 0.30 |
| 32.667 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.29 |
| 32.750 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.29 |
| 32.833 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 32.917 | 0.00 | 0.09 | 0.031 | O | \| | \| | \| | \| | 0.28 |
| 33.000 | 0.00 | 0.09 | 0.031 | O | \| | \| | \| | \| | 0.27 |
| 33.083 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.27 |
| 33.167 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.26 |
| 33.250 | 0.00 | 0.09 | 0.029 | O | \| | \| | \| | \| | 0.26 |
| 33.333 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 33.417 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 33.500 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 33.583 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 33.667 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 33.750 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 33.833 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 33.917 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 34.000 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 34.083 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 34.167 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.20 |
| 34.250 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.20 |
| 34.333 | 0.00 | 0.07 | 0.022 | O | \| | \| | \| | \| | 0.20 |
| 34.417 | 0.00 | 0.06 | 0.022 | O | \| | \| | \| | \| | 0.19 |
| 34.500 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 34.583 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.18 |
| 34.667 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.18 |
| 34.750 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.18 |
| 34.833 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.17 |
| 34.917 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 35.000 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 35.083 | 0.00 | 0.05 | 0.019 | O | \| | \| | \| | \| | 0.16 |
| 35.167 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 35.250 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 35.333 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 35.417 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 35.500 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 35.583 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 35.667 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | 0.14 |
| 35.750 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | 0.14 |
| 35.833 | 0.00 | 0.05 | 0.015 | O | \| | \| | \| | 0.14 |
| 35.917 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | 0.13 |
| 36.000 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | 0.13 |
| 36.083 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | 0.13 |
| 36.167 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | 0.13 |
| 36.250 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | 0.12 |
| 36.333 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | 0.12 |
| 36.417 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.12 |
| 36.500 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.12 |
| 36.583 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.11 |
| 36.667 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.11 |
| 36.750 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.833 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.917 | 0.00 | 0.03 | 0.012 | O | \| | \| | \| | 0.10 |
| 37.000 | 0.00 | 0.03 | 0.012 | O | \| | \| | \| | 0.10 |
| 37.083 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 37.167 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 37.250 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 37.333 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.09 |
| 37.417 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.09 |
| 37.500 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.583 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.667 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.750 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.833 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.917 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 38.000 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 38.083 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 38.167 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 38.250 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 38.333 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.417 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.500 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.583 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.667 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.750 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.833 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.07 |
| 38.917 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.000 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.083 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.167 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.250 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.333 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.417 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 39.500 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 39.583 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.667 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.750 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.833 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.917 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 40.000 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 40.083 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 40.167 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 40.250 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 40.333 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 40.417 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.500 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.583 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.667 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.750 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.833 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.917 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.000 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.083 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.167 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.250 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.333 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.417 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.500 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 41.583 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | \| | 0.03 |
| 41.667 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | \| | 0.03 |
| 41.750 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | \| | 0.03 |
| 41.833 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | \| | 0.03 |
| 41.917 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | \| | 0.03 |
| 42.000 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.083 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.167 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.250 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.333 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.417 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.500 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.583 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.667 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.750 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.833 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.917 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 43.000 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 43.083 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 43.167 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 43.250 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 43.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.667 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.750 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.833 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.917 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.000 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.083 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.167 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.250 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.667 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.750 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.833 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.917 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.000 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.083 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.167 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.250 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.333 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.417 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 47.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 50.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.333 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.417 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.750 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.833 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.917 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.333 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.417 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |

**********HYDROGRAPH DATA**********

Number of intervals = 619
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 8.236 (CFS)
Total volume = 3.255 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

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# Flood Routing Analysis: Developed Condition
# (25 yr Storm Event)

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018
                        Study date: 07/01/23


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


      CHAMBER ROUTING
      CONCO INDUSTRIAL
      25-YR STORM EVENT

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


      Program License Serial Number 6484

      ---------------------------------------------------------------------
      ********************* HYDROGRAPH INFORMATION **********************

                    From study/file name: CON1.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =   294
                    Time interval =    5.0 (Min.)
                    Maximum/Peak flow rate =       18.007 (CFS)
                    Total volume =       2.584 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        0.000 to Point/Station        1.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 294
      Hydrograph time unit =  5.000 (Min.)
      Initial depth in storage basin =   0.00(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.00 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.500      0.170      0.500      0.168        0.172
        3.000      0.390      1.500      0.385        0.395
        4.500      0.680      4.300      0.665        0.695
        6.000      0.900      8.000      0.872        0.928
        6.700      0.960      8.700      0.930        0.990
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0       4.5    9.00   13.51   18.01 (Ft.)
 0.083    0.03    0.00      0.000  O       |       |       |       |     0.00
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0.167 | 0.18 | 0.00 | 0.001 | O | | | | 0.01 |
| 0.250 | 0.40 | 0.01 | 0.003 | O | | | | 0.02 |
| 0.333 | 0.51 | 0.02 | 0.006 | O | | | | 0.05 |
| 0.417 | 0.55 | 0.03 | 0.009 | O | | | | 0.08 |
| 0.500 | 0.56 | 0.04 | 0.013 | O | | | | 0.11 |
| 0.583 | 0.57 | 0.05 | 0.016 | OI | | | | 0.14 |
| 0.667 | 0.57 | 0.06 | 0.020 | OI | | | | 0.18 |
| 0.750 | 0.57 | 0.07 | 0.023 | OI | | | | 0.21 |
| 0.833 | 0.57 | 0.08 | 0.027 | OI | | | | 0.24 |
| 0.917 | 0.57 | 0.09 | 0.030 | OI | | | | 0.27 |
| 1.000 | 0.57 | 0.10 | 0.034 | OI | | | | 0.30 |
| 1.083 | 0.58 | 0.11 | 0.037 | OI | | | | 0.32 |
| 1.167 | 0.58 | 0.12 | 0.040 | OI | | | | 0.35 |
| 1.250 | 0.58 | 0.13 | 0.043 | OI | | | | 0.38 |
| 1.333 | 0.58 | 0.14 | 0.046 | OI | | | | 0.41 |
| 1.417 | 0.58 | 0.14 | 0.049 | OI | | | | 0.43 |
| 1.500 | 0.59 | 0.15 | 0.052 | OI | | | | 0.46 |
| 1.583 | 0.59 | 0.16 | 0.055 | OI | | | | 0.49 |
| 1.667 | 0.59 | 0.17 | 0.058 | OI | | | | 0.51 |
| 1.750 | 0.59 | 0.18 | 0.061 | OI | | | | 0.54 |
| 1.833 | 0.59 | 0.19 | 0.064 | OI | | | | 0.56 |
| 1.917 | 0.60 | 0.20 | 0.067 | OI | | | | 0.59 |
| 2.000 | 0.60 | 0.20 | 0.069 | OI | | | | 0.61 |
| 2.083 | 0.60 | 0.21 | 0.072 | OI | | | | 0.64 |
| 2.167 | 0.60 | 0.22 | 0.075 | OI | | | | 0.66 |
| 2.250 | 0.60 | 0.23 | 0.077 | OI | | | | 0.68 |
| 2.333 | 0.61 | 0.23 | 0.080 | OI | | | | 0.70 |
| 2.417 | 0.61 | 0.24 | 0.082 | OI | | | | 0.73 |
| 2.500 | 0.61 | 0.25 | 0.085 | OI | | | | 0.75 |
| 2.583 | 0.61 | 0.26 | 0.087 | OI | | | | 0.77 |
| 2.667 | 0.61 | 0.26 | 0.090 | OI | | | | 0.79 |
| 2.750 | 0.62 | 0.27 | 0.092 | OI | | | | 0.81 |
| 2.833 | 0.62 | 0.28 | 0.094 | OI | | | | 0.83 |
| 2.917 | 0.62 | 0.28 | 0.097 | OI | | | | 0.85 |
| 3.000 | 0.62 | 0.29 | 0.099 | OI | | | | 0.87 |
| 3.083 | 0.62 | 0.30 | 0.101 | OI | | | | 0.89 |
| 3.167 | 0.63 | 0.30 | 0.104 | OI | | | | 0.91 |
| 3.250 | 0.63 | 0.31 | 0.106 | OI | | | | 0.93 |
| 3.333 | 0.63 | 0.32 | 0.108 | OI | | | | 0.95 |
| 3.417 | 0.63 | 0.32 | 0.110 | OI | | | | 0.97 |
| 3.500 | 0.64 | 0.33 | 0.112 | OI | | | | 0.99 |
| 3.583 | 0.64 | 0.34 | 0.114 | OI | | | | 1.01 |
| 3.667 | 0.64 | 0.34 | 0.116 | OI | | | | 1.03 |
| 3.750 | 0.64 | 0.35 | 0.118 | OI | | | | 1.04 |
| 3.833 | 0.65 | 0.35 | 0.120 | OI | | | | 1.06 |
| 3.917 | 0.65 | 0.36 | 0.122 | OI | | | | 1.08 |
| 4.000 | 0.65 | 0.37 | 0.124 | OI | | | | 1.10 |
| 4.083 | 0.65 | 0.37 | 0.126 | OI | | | | 1.11 |
| 4.167 | 0.66 | 0.38 | 0.128 | OI | | | | 1.13 |
| 4.250 | 0.66 | 0.38 | 0.130 | OI | | | | 1.15 |
| 4.333 | 0.66 | 0.39 | 0.132 | OI | | | | 1.17 |
| 4.417 | 0.66 | 0.39 | 0.134 | OI | | | | 1.18 |
| 4.500 | 0.67 | 0.40 | 0.136 | OI | | | | 1.20 |
| 4.583 | 0.67 | 0.40 | 0.138 | OI | | | | 1.21 |
| 4.667 | 0.67 | 0.41 | 0.139 | OI | | | | 1.23 |
| 4.750 | 0.67 | 0.42 | 0.141 | OI | | | | 1.25 |
| 4.833 | 0.68 | 0.42 | 0.143 | OI | | | | 1.26 |
| 4.917 | 0.68 | 0.43 | 0.145 | OI | | | | 1.28 |
| 5.000 | 0.68 | 0.43 | 0.146 | OI | | | | 1.29 |
| 5.083 | 0.69 | 0.44 | 0.148 | OI | | | | 1.31 |
| 5.167 | 0.69 | 0.44 | 0.150 | OI | | | | 1.32 |
| 5.250 | 0.69 | 0.45 | 0.152 | OI | | | | 1.34 |
| 5.333 | 0.69 | 0.45 | 0.153 | OI | | | | 1.35 |
| 5.417 | 0.70 | 0.46 | 0.155 | OI | | | | 1.37 |
| 5.500 | 0.70 | 0.46 | 0.157 | OI | | | | 1.38 |
| 5.583 | 0.70 | 0.47 | 0.158 | OI | | | | 1.40 |
| 5.667 | 0.71 | 0.47 | 0.160 | OI | | | | 1.41 |
| 5.750 | 0.71 | 0.47 | 0.161 | OI | | | | 1.42 |
| 5.833 | 0.71 | 0.48 | 0.163 | OI | | | | 1.44 |
| 5.917 | 0.72 | 0.48 | 0.165 | OI | | | | 1.45 |
| 6.000 | 0.72 | 0.49 | 0.166 | OI | | | | 1.47 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.083 | 0.72 | 0.49 | 0.168 | OI | | | | | 1.48 |
| 6.167 | 0.73 | 0.50 | 0.169 | OI | | | | | 1.50 |
| 6.250 | 0.73 | 0.50 | 0.171 | OI | | | | | 1.51 |
| 6.333 | 0.73 | 0.51 | 0.173 | OI | | | | | 1.52 |
| 6.417 | 0.74 | 0.52 | 0.174 | OI | | | | | 1.53 |
| 6.500 | 0.74 | 0.53 | 0.176 | OI | | | | | 1.54 |
| 6.583 | 0.74 | 0.53 | 0.177 | OI | | | | | 1.55 |
| 6.667 | 0.75 | 0.54 | 0.178 | OI | | | | | 1.56 |
| 6.750 | 0.75 | 0.54 | 0.180 | OI | | | | | 1.57 |
| 6.833 | 0.75 | 0.55 | 0.181 | OI | | | | | 1.58 |
| 6.917 | 0.76 | 0.56 | 0.183 | OI | | | | | 1.59 |
| 7.000 | 0.76 | 0.56 | 0.184 | O | | | | | 1.60 |
| 7.083 | 0.77 | 0.57 | 0.185 | O | | | | | 1.60 |
| 7.167 | 0.77 | 0.58 | 0.187 | O | | | | | 1.61 |
| 7.250 | 0.77 | 0.58 | 0.188 | O | | | | | 1.62 |
| 7.333 | 0.78 | 0.59 | 0.189 | O | | | | | 1.63 |
| 7.417 | 0.78 | 0.59 | 0.191 | O | | | | | 1.64 |
| 7.500 | 0.79 | 0.60 | 0.192 | O | | | | | 1.65 |
| 7.583 | 0.79 | 0.61 | 0.193 | O | | | | | 1.66 |
| 7.667 | 0.79 | 0.61 | 0.195 | O | | | | | 1.67 |
| 7.750 | 0.80 | 0.62 | 0.196 | O | | | | | 1.68 |
| 7.833 | 0.80 | 0.62 | 0.197 | O | | | | | 1.68 |
| 7.917 | 0.81 | 0.63 | 0.198 | O | | | | | 1.69 |
| 8.000 | 0.81 | 0.63 | 0.200 | O | | | | | 1.70 |
| 8.083 | 0.82 | 0.64 | 0.201 | O | | | | | 1.71 |
| 8.167 | 0.82 | 0.65 | 0.202 | O | | | | | 1.72 |
| 8.250 | 0.83 | 0.65 | 0.203 | O | | | | | 1.73 |
| 8.333 | 0.83 | 0.66 | 0.204 | O | | | | | 1.73 |
| 8.417 | 0.84 | 0.66 | 0.206 | O | | | | | 1.74 |
| 8.500 | 0.84 | 0.67 | 0.207 | O | | | | | 1.75 |
| 8.583 | 0.85 | 0.67 | 0.208 | O | | | | | 1.76 |
| 8.667 | 0.85 | 0.68 | 0.209 | O | | | | | 1.77 |
| 8.750 | 0.86 | 0.68 | 0.210 | O | | | | | 1.78 |
| 8.833 | 0.86 | 0.69 | 0.212 | O | | | | | 1.78 |
| 8.917 | 0.87 | 0.69 | 0.213 | O | | | | | 1.79 |
| 9.000 | 0.87 | 0.70 | 0.214 | O | | | | | 1.80 |
| 9.083 | 0.88 | 0.71 | 0.215 | O | | | | | 1.81 |
| 9.167 | 0.89 | 0.71 | 0.216 | O | | | | | 1.82 |
| 9.250 | 0.89 | 0.72 | 0.218 | O | | | | | 1.82 |
| 9.333 | 0.90 | 0.72 | 0.219 | O | | | | | 1.83 |
| 9.417 | 0.90 | 0.73 | 0.220 | O | | | | | 1.84 |
| 9.500 | 0.91 | 0.73 | 0.221 | O | | | | | 1.85 |
| 9.583 | 0.92 | 0.74 | 0.222 | O | | | | | 1.86 |
| 9.667 | 0.92 | 0.74 | 0.224 | O | | | | | 1.87 |
| 9.750 | 0.93 | 0.75 | 0.225 | O | | | | | 1.87 |
| 9.833 | 0.94 | 0.76 | 0.226 | O | | | | | 1.88 |
| 9.917 | 0.94 | 0.76 | 0.227 | O | | | | | 1.89 |
| 10.000 | 0.95 | 0.77 | 0.229 | O | | | | | 1.90 |
| 10.083 | 0.96 | 0.77 | 0.230 | O | | | | | 1.91 |
| 10.167 | 0.97 | 0.78 | 0.231 | O | | | | | 1.92 |
| 10.250 | 0.97 | 0.78 | 0.233 | O | | | | | 1.93 |
| 10.333 | 0.98 | 0.79 | 0.234 | O | | | | | 1.94 |
| 10.417 | 0.99 | 0.80 | 0.235 | O | | | | | 1.94 |
| 10.500 | 1.00 | 0.80 | 0.237 | O | | | | | 1.95 |
| 10.583 | 1.01 | 0.81 | 0.238 | O | | | | | 1.96 |
| 10.667 | 1.01 | 0.81 | 0.239 | O | | | | | 1.97 |
| 10.750 | 1.02 | 0.82 | 0.241 | O | | | | | 1.98 |
| 10.833 | 1.03 | 0.83 | 0.242 | O | | | | | 1.99 |
| 10.917 | 1.04 | 0.83 | 0.243 | O | | | | | 2.00 |
| 11.000 | 1.05 | 0.84 | 0.245 | O | | | | | 2.01 |
| 11.083 | 1.06 | 0.85 | 0.246 | O | | | | | 2.02 |
| 11.167 | 1.07 | 0.85 | 0.248 | O | | | | | 2.03 |
| 11.250 | 1.08 | 0.86 | 0.249 | O | | | | | 2.04 |
| 11.333 | 1.09 | 0.87 | 0.251 | O | | | | | 2.05 |
| 11.417 | 1.10 | 0.87 | 0.252 | O | | | | | 2.06 |
| 11.500 | 1.11 | 0.88 | 0.254 | O | | | | | 2.07 |
| 11.583 | 1.12 | 0.89 | 0.255 | O | | | | | 2.08 |
| 11.667 | 1.13 | 0.90 | 0.257 | OI | | | | | 2.09 |
| 11.750 | 1.15 | 0.90 | 0.259 | OI | | | | | 2.11 |
| 11.833 | 1.16 | 0.91 | 0.260 | OI | | | | | 2.12 |
| 11.917 | 1.17 | 0.92 | 0.262 | OI | | | | | 2.13 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 12.000 | 1.18 | 0.93 | 0.264 | OI | | | | | 2.14 |
| 12.083 | 1.21 | 0.94 | 0.266 | OI | | | | | 2.15 |
| 12.167 | 1.27 | 0.94 | 0.268 | OI | | | | | 2.17 |
| 12.250 | 1.36 | 0.96 | 0.270 | OI | | | | | 2.18 |
| 12.333 | 1.42 | 0.97 | 0.273 | OI | | | | | 2.20 |
| 12.417 | 1.45 | 0.98 | 0.276 | OI | | | | | 2.23 |
| 12.500 | 1.47 | 1.00 | 0.280 | OI | | | | | 2.25 |
| 12.583 | 1.48 | 1.01 | 0.283 | OI | | | | | 2.27 |
| 12.667 | 1.50 | 1.03 | 0.286 | OI | | | | | 2.29 |
| 12.750 | 1.52 | 1.04 | 0.289 | OI | | | | | 2.31 |
| 12.833 | 1.54 | 1.06 | 0.293 | OI | | | | | 2.34 |
| 12.917 | 1.56 | 1.07 | 0.296 | OI | | | | | 2.36 |
| 13.000 | 1.58 | 1.09 | 0.299 | OI | | | | | 2.38 |
| 13.083 | 1.60 | 1.10 | 0.303 | OI | | | | | 2.40 |
| 13.167 | 1.62 | 1.12 | 0.306 | OI | | | | | 2.43 |
| 13.250 | 1.64 | 1.13 | 0.310 | O | | | | | 2.45 |
| 13.333 | 1.66 | 1.15 | 0.313 | O | | | | | 2.48 |
| 13.417 | 1.69 | 1.17 | 0.317 | O | | | | | 2.50 |
| 13.500 | 1.71 | 1.18 | 0.320 | OI | | | | | 2.52 |
| 13.583 | 1.74 | 1.20 | 0.324 | OI | | | | | 2.55 |
| 13.667 | 1.77 | 1.22 | 0.328 | OI | | | | | 2.57 |
| 13.750 | 1.79 | 1.23 | 0.331 | OI | | | | | 2.60 |
| 13.833 | 1.82 | 1.25 | 0.335 | OI | | | | | 2.63 |
| 13.917 | 1.86 | 1.27 | 0.339 | OI | | | | | 2.65 |
| 14.000 | 1.89 | 1.29 | 0.343 | OI | | | | | 2.68 |
| 14.083 | 1.93 | 1.31 | 0.348 | OI | | | | | 2.71 |
| 14.167 | 1.96 | 1.33 | 0.352 | OI | | | | | 2.74 |
| 14.250 | 2.01 | 1.35 | 0.356 | OI | | | | | 2.77 |
| 14.333 | 2.05 | 1.37 | 0.361 | OI | | | | | 2.80 |
| 14.417 | 2.09 | 1.39 | 0.366 | OI | | | | | 2.84 |
| 14.500 | 2.14 | 1.41 | 0.371 | OI | | | | | 2.87 |
| 14.583 | 2.20 | 1.44 | 0.376 | OI | | | | | 2.90 |
| 14.667 | 2.25 | 1.46 | 0.381 | O I | | | | | 2.94 |
| 14.750 | 2.32 | 1.49 | 0.387 | O I | | | | | 2.98 |
| 14.833 | 2.38 | 1.53 | 0.393 | O I | | | | | 3.01 |
| 14.917 | 2.46 | 1.58 | 0.399 | O I | | | | | 3.04 |
| 15.000 | 2.54 | 1.64 | 0.405 | O I | | | | | 3.08 |
| 15.083 | 2.63 | 1.70 | 0.411 | OI | | | | | 3.11 |
| 15.167 | 2.72 | 1.76 | 0.417 | OI | | | | | 3.14 |
| 15.250 | 2.84 | 1.83 | 0.424 | O I | | | | | 3.18 |
| 15.333 | 2.96 | 1.90 | 0.431 | O I | | | | | 3.21 |
| 15.417 | 3.08 | 1.97 | 0.439 | O I | | | | | 3.25 |
| 15.500 | 3.05 | 2.04 | 0.446 | O I | | | | | 3.29 |
| 15.583 | 2.97 | 2.10 | 0.453 | O I | | | | | 3.32 |
| 15.667 | 3.07 | 2.16 | 0.459 | O I | | | | | 3.36 |
| 15.750 | 3.34 | 2.23 | 0.466 | O I | | | | | 3.39 |
| 15.833 | 3.77 | 2.32 | 0.474 | O I | | | | | 3.44 |
| 15.917 | 4.45 | 2.43 | 0.486 | O I | | | | | 3.50 |
| 16.000 | 5.68 | 2.60 | 0.504 | O | I | | | | 3.59 |
| 16.083 | 8.78 | 2.90 | 0.535 | O | I | | | | 3.75 |
| 16.167 | 15.46 | 3.49 | 0.596 | O | | | I | | 4.07 |
| 16.250 | 18.01 | 4.38 | 0.684 | O | | | | I | 4.53 |
| 16.333 | 11.24 | 5.50 | 0.751 | O | I | | | | 4.99 |
| 16.417 | 6.15 | 5.85 | 0.772 | O | | | | | 5.13 |
| 16.500 | 4.07 | 5.77 | 0.767 | O | | | | | 5.09 |
| 16.583 | 3.62 | 5.56 | 0.755 | O | | | | | 5.01 |
| 16.667 | 3.06 | 5.31 | 0.740 | O | | | | | 4.91 |
| 16.750 | 2.81 | 5.05 | 0.725 | O | | | | | 4.81 |
| 16.833 | 2.61 | 4.80 | 0.710 | O | | | | | 4.70 |
| 16.917 | 2.45 | 4.55 | 0.695 | O | | | | | 4.60 |
| 17.000 | 2.30 | 4.31 | 0.681 | O | | | | | 4.50 |
| 17.083 | 2.19 | 4.17 | 0.667 | O | | | | | 4.43 |
| 17.167 | 2.08 | 4.04 | 0.653 | O | | | | | 4.36 |
| 17.250 | 2.00 | 3.91 | 0.640 | O | | | | | 4.29 |
| 17.333 | 1.92 | 3.79 | 0.627 | O | | | | | 4.23 |
| 17.417 | 1.85 | 3.66 | 0.614 | O | | | | | 4.16 |
| 17.500 | 1.79 | 3.55 | 0.602 | O | | | | | 4.10 |
| 17.583 | 1.73 | 3.43 | 0.590 | O | | | | | 4.03 |
| 17.667 | 1.68 | 3.32 | 0.579 | O | | | | | 3.98 |
| 17.750 | 1.63 | 3.21 | 0.567 | O | | | | | 3.92 |
| 17.833 | 1.59 | 3.11 | 0.557 | O | | | | | 3.86 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 17.917 | 1.55 | 3.01 | 0.546 | \| I  O \| | \| | \| | \| | 3.81 |
| 18.000 | 1.51 | 2.92 | 0.537 | \| I  O \| | \| | \| | \| | 3.76 |
| 18.083 | 1.47 | 2.82 | 0.527 | \| I  O \| | \| | \| | \| | 3.71 |
| 18.167 | 1.39 | 2.73 | 0.518 | \| I O  \| | \| | \| | \| | 3.66 |
| 18.250 | 1.28 | 2.64 | 0.508 | \| I O  \| | \| | \| | \| | 3.61 |
| 18.333 | 1.21 | 2.55 | 0.499 | \| I O  \| | \| | \| | \| | 3.56 |
| 18.417 | 1.17 | 2.47 | 0.490 | \| I O  \| | \| | \| | \| | 3.52 |
| 18.500 | 1.14 | 2.38 | 0.481 | \| I O  \| | \| | \| | \| | 3.47 |
| 18.583 | 1.12 | 2.30 | 0.473 | \|I  O  \| | \| | \| | \| | 3.43 |
| 18.667 | 1.10 | 2.22 | 0.465 | \|I O   \| | \| | \| | \| | 3.39 |
| 18.750 | 1.08 | 2.15 | 0.457 | \|I O   \| | \| | \| | \| | 3.35 |
| 18.833 | 1.06 | 2.08 | 0.450 | \|I O   \| | \| | \| | \| | 3.31 |
| 18.917 | 1.04 | 2.01 | 0.443 | \|I O   \| | \| | \| | \| | 3.28 |
| 19.000 | 1.02 | 1.95 | 0.437 | \|I O   \| | \| | \| | \| | 3.24 |
| 19.083 | 1.00 | 1.89 | 0.430 | \|I O   \| | \| | \| | \| | 3.21 |
| 19.167 | 0.99 | 1.83 | 0.425 | \|I O   \| | \| | \| | \| | 3.18 |
| 19.250 | 0.97 | 1.78 | 0.419 | \|I O   \| | \| | \| | \| | 3.15 |
| 19.333 | 0.96 | 1.73 | 0.413 | \|I O   \| | \| | \| | \| | 3.12 |
| 19.417 | 0.94 | 1.68 | 0.408 | \|IO    \| | \| | \| | \| | 3.09 |
| 19.500 | 0.93 | 1.63 | 0.403 | \|IO    \| | \| | \| | \| | 3.07 |
| 19.583 | 0.91 | 1.58 | 0.399 | \|IO    \| | \| | \| | \| | 3.04 |
| 19.667 | 0.90 | 1.54 | 0.394 | \|IO    \| | \| | \| | \| | 3.02 |
| 19.750 | 0.89 | 1.50 | 0.390 | \|IO    \| | \| | \| | \| | 3.00 |
| 19.833 | 0.88 | 1.48 | 0.386 | \|IO    \| | \| | \| | \| | 2.97 |
| 19.917 | 0.87 | 1.46 | 0.381 | \|IO    \| | \| | \| | \| | 2.94 |
| 20.000 | 0.86 | 1.44 | 0.377 | \|IO    \| | \| | \| | \| | 2.91 |
| 20.083 | 0.85 | 1.42 | 0.373 | \|IO    \| | \| | \| | \| | 2.89 |
| 20.167 | 0.84 | 1.41 | 0.369 | \|IO    \| | \| | \| | \| | 2.86 |
| 20.250 | 0.83 | 1.39 | 0.366 | \|IO    \| | \| | \| | \| | 2.83 |
| 20.333 | 0.82 | 1.37 | 0.362 | \|IO    \| | \| | \| | \| | 2.81 |
| 20.417 | 0.81 | 1.35 | 0.358 | \|IO    \| | \| | \| | \| | 2.78 |
| 20.500 | 0.80 | 1.34 | 0.354 | \|IO    \| | \| | \| | \| | 2.76 |
| 20.583 | 0.79 | 1.32 | 0.350 | \|IO    \| | \| | \| | \| | 2.73 |
| 20.667 | 0.78 | 1.30 | 0.347 | \|IO    \| | \| | \| | \| | 2.71 |
| 20.750 | 0.77 | 1.29 | 0.343 | \|IO    \| | \| | \| | \| | 2.68 |
| 20.833 | 0.76 | 1.27 | 0.340 | \|IO    \| | \| | \| | \| | 2.66 |
| 20.917 | 0.76 | 1.26 | 0.336 | \|IO    \| | \| | \| | \| | 2.63 |
| 21.000 | 0.75 | 1.24 | 0.333 | \|IO    \| | \| | \| | \| | 2.61 |
| 21.083 | 0.74 | 1.23 | 0.330 | \|IO    \| | \| | \| | \| | 2.59 |
| 21.167 | 0.74 | 1.21 | 0.326 | \|IO    \| | \| | \| | \| | 2.57 |
| 21.250 | 0.73 | 1.20 | 0.323 | \|IO    \| | \| | \| | \| | 2.54 |
| 21.333 | 0.72 | 1.18 | 0.320 | \|IO    \| | \| | \| | \| | 2.52 |
| 21.417 | 0.71 | 1.17 | 0.317 | \|IO    \| | \| | \| | \| | 2.50 |
| 21.500 | 0.71 | 1.15 | 0.314 | \|IO    \| | \| | \| | \| | 2.48 |
| 21.583 | 0.70 | 1.14 | 0.311 | \|IO    \| | \| | \| | \| | 2.46 |
| 21.667 | 0.70 | 1.13 | 0.308 | \|O     \| | \| | \| | \| | 2.44 |
| 21.750 | 0.69 | 1.11 | 0.305 | \|O     \| | \| | \| | \| | 2.42 |
| 21.833 | 0.68 | 1.10 | 0.302 | \|O     \| | \| | \| | \| | 2.40 |
| 21.917 | 0.68 | 1.09 | 0.299 | \|O     \| | \| | \| | \| | 2.38 |
| 22.000 | 0.67 | 1.07 | 0.296 | \|O     \| | \| | \| | \| | 2.36 |
| 22.083 | 0.67 | 1.06 | 0.293 | \|O     \| | \| | \| | \| | 2.34 |
| 22.167 | 0.66 | 1.05 | 0.291 | \|O     \| | \| | \| | \| | 2.32 |
| 22.250 | 0.66 | 1.04 | 0.288 | \|O     \| | \| | \| | \| | 2.31 |
| 22.333 | 0.65 | 1.02 | 0.285 | \|O     \| | \| | \| | \| | 2.29 |
| 22.417 | 0.65 | 1.01 | 0.283 | \|O     \| | \| | \| | \| | 2.27 |
| 22.500 | 0.64 | 1.00 | 0.280 | \|O     \| | \| | \| | \| | 2.25 |
| 22.583 | 0.64 | 0.99 | 0.278 | \|O     \| | \| | \| | \| | 2.24 |
| 22.667 | 0.63 | 0.98 | 0.276 | \|O     \| | \| | \| | \| | 2.22 |
| 22.750 | 0.63 | 0.97 | 0.273 | \|O     \| | \| | \| | \| | 2.20 |
| 22.833 | 0.62 | 0.96 | 0.271 | \|O     \| | \| | \| | \| | 2.19 |
| 22.917 | 0.62 | 0.95 | 0.269 | \|O     \| | \| | \| | \| | 2.17 |
| 23.000 | 0.61 | 0.94 | 0.266 | \|O     \| | \| | \| | \| | 2.16 |
| 23.083 | 0.61 | 0.93 | 0.264 | \|O     \| | \| | \| | \| | 2.14 |
| 23.167 | 0.61 | 0.92 | 0.262 | \|O     \| | \| | \| | \| | 2.13 |
| 23.250 | 0.60 | 0.91 | 0.260 | \|O     \| | \| | \| | \| | 2.11 |
| 23.333 | 0.60 | 0.90 | 0.258 | \|O     \| | \| | \| | \| | 2.10 |
| 23.417 | 0.59 | 0.89 | 0.256 | \|O     \| | \| | \| | \| | 2.08 |
| 23.500 | 0.59 | 0.88 | 0.254 | \|O     \| | \| | \| | \| | 2.07 |
| 23.583 | 0.59 | 0.87 | 0.252 | \|O     \| | \| | \| | \| | 2.06 |
| 23.667 | 0.58 | 0.86 | 0.250 | \|O     \| | \| | \| | \| | 2.04 |
| 23.750 | 0.58 | 0.85 | 0.248 | \|O     \| | \| | \| | \| | 2.03 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23.833 | 0.58 | 0.85 | 0.246 | \|O | \| | \| | \| | \| | 2.02 |
| 23.917 | 0.57 | 0.84 | 0.244 | \|O | \| | \| | \| | \| | 2.01 |
| 24.000 | 0.57 | 0.83 | 0.242 | \|O | \| | \| | \| | \| | 1.99 |
| 24.083 | 0.54 | 0.82 | 0.240 | IO | \| | \| | \| | \| | 1.98 |
| 24.167 | 0.39 | 0.81 | 0.238 | IO | \| | \| | \| | \| | 1.96 |
| 24.250 | 0.16 | 0.79 | 0.234 | IO | \| | \| | \| | \| | 1.94 |
| 24.333 | 0.05 | 0.77 | 0.230 | IO | \| | \| | \| | \| | 1.91 |
| 24.417 | 0.01 | 0.75 | 0.225 | IO | \| | \| | \| | \| | 1.87 |
| 24.500 | 0.01 | 0.73 | 0.220 | IO | \| | \| | \| | \| | 1.84 |
| 24.583 | 0.00 | 0.70 | 0.215 | IO | \| | \| | \| | \| | 1.81 |
| 24.667 | 0.00 | 0.68 | 0.210 | IO | \| | \| | \| | \| | 1.77 |
| 24.750 | 0.00 | 0.66 | 0.205 | IO | \| | \| | \| | \| | 1.74 |
| 24.833 | 0.00 | 0.64 | 0.201 | IO | \| | \| | \| | \| | 1.71 |
| 24.917 | 0.00 | 0.62 | 0.197 | IO | \| | \| | \| | \| | 1.68 |
| 25.000 | 0.00 | 0.60 | 0.192 | IO | \| | \| | \| | \| | 1.65 |
| 25.083 | 0.00 | 0.58 | 0.188 | IO | \| | \| | \| | \| | 1.62 |
| 25.167 | 0.00 | 0.57 | 0.184 | IO | \| | \| | \| | \| | 1.60 |
| 25.250 | 0.00 | 0.55 | 0.181 | O | \| | \| | \| | \| | 1.57 |
| 25.333 | 0.00 | 0.53 | 0.177 | O | \| | \| | \| | \| | 1.55 |
| 25.417 | 0.00 | 0.51 | 0.173 | O | \| | \| | \| | \| | 1.52 |
| 25.500 | 0.00 | 0.50 | 0.170 | O | \| | \| | \| | \| | 1.50 |
| 25.583 | 0.00 | 0.49 | 0.166 | O | \| | \| | \| | \| | 1.47 |
| 25.667 | 0.00 | 0.48 | 0.163 | O | \| | \| | \| | \| | 1.44 |
| 25.750 | 0.00 | 0.47 | 0.160 | O | \| | \| | \| | \| | 1.41 |
| 25.833 | 0.00 | 0.46 | 0.157 | O | \| | \| | \| | \| | 1.38 |
| 25.917 | 0.00 | 0.45 | 0.153 | O | \| | \| | \| | \| | 1.35 |
| 26.000 | 0.00 | 0.44 | 0.150 | O | \| | \| | \| | \| | 1.33 |
| 26.083 | 0.00 | 0.43 | 0.147 | O | \| | \| | \| | \| | 1.30 |
| 26.167 | 0.00 | 0.42 | 0.144 | O | \| | \| | \| | \| | 1.27 |
| 26.250 | 0.00 | 0.42 | 0.141 | O | \| | \| | \| | \| | 1.25 |
| 26.333 | 0.00 | 0.41 | 0.139 | O | \| | \| | \| | \| | 1.22 |
| 26.417 | 0.00 | 0.40 | 0.136 | O | \| | \| | \| | \| | 1.20 |
| 26.500 | 0.00 | 0.39 | 0.133 | O | \| | \| | \| | \| | 1.17 |
| 26.583 | 0.00 | 0.38 | 0.130 | O | \| | \| | \| | \| | 1.15 |
| 26.667 | 0.00 | 0.38 | 0.128 | O | \| | \| | \| | \| | 1.13 |
| 26.750 | 0.00 | 0.37 | 0.125 | O | \| | \| | \| | \| | 1.11 |
| 26.833 | 0.00 | 0.36 | 0.123 | O | \| | \| | \| | \| | 1.08 |
| 26.917 | 0.00 | 0.35 | 0.120 | O | \| | \| | \| | \| | 1.06 |
| 27.000 | 0.00 | 0.35 | 0.118 | O | \| | \| | \| | \| | 1.04 |
| 27.083 | 0.00 | 0.34 | 0.116 | O | \| | \| | \| | \| | 1.02 |
| 27.167 | 0.00 | 0.33 | 0.113 | O | \| | \| | \| | \| | 1.00 |
| 27.250 | 0.00 | 0.33 | 0.111 | O | \| | \| | \| | \| | 0.98 |
| 27.333 | 0.00 | 0.32 | 0.109 | O | \| | \| | \| | \| | 0.96 |
| 27.417 | 0.00 | 0.31 | 0.107 | O | \| | \| | \| | \| | 0.94 |
| 27.500 | 0.00 | 0.31 | 0.104 | O | \| | \| | \| | \| | 0.92 |
| 27.583 | 0.00 | 0.30 | 0.102 | O | \| | \| | \| | \| | 0.90 |
| 27.667 | 0.00 | 0.29 | 0.100 | O | \| | \| | \| | \| | 0.88 |
| 27.750 | 0.00 | 0.29 | 0.098 | O | \| | \| | \| | \| | 0.87 |
| 27.833 | 0.00 | 0.28 | 0.096 | O | \| | \| | \| | \| | 0.85 |
| 27.917 | 0.00 | 0.28 | 0.094 | O | \| | \| | \| | \| | 0.83 |
| 28.000 | 0.00 | 0.27 | 0.092 | O | \| | \| | \| | \| | 0.82 |
| 28.083 | 0.00 | 0.27 | 0.091 | O | \| | \| | \| | \| | 0.80 |
| 28.167 | 0.00 | 0.26 | 0.089 | O | \| | \| | \| | \| | 0.78 |
| 28.250 | 0.00 | 0.26 | 0.087 | O | \| | \| | \| | \| | 0.77 |
| 28.333 | 0.00 | 0.25 | 0.085 | O | \| | \| | \| | \| | 0.75 |
| 28.417 | 0.00 | 0.25 | 0.084 | O | \| | \| | \| | \| | 0.74 |
| 28.500 | 0.00 | 0.24 | 0.082 | O | \| | \| | \| | \| | 0.72 |
| 28.583 | 0.00 | 0.24 | 0.080 | O | \| | \| | \| | \| | 0.71 |
| 28.667 | 0.00 | 0.23 | 0.079 | O | \| | \| | \| | \| | 0.69 |
| 28.750 | 0.00 | 0.23 | 0.077 | O | \| | \| | \| | \| | 0.68 |
| 28.833 | 0.00 | 0.22 | 0.075 | O | \| | \| | \| | \| | 0.67 |
| 28.917 | 0.00 | 0.22 | 0.074 | O | \| | \| | \| | \| | 0.65 |
| 29.000 | 0.00 | 0.21 | 0.072 | O | \| | \| | \| | \| | 0.64 |
| 29.083 | 0.00 | 0.21 | 0.071 | O | \| | \| | \| | \| | 0.63 |
| 29.167 | 0.00 | 0.20 | 0.070 | O | \| | \| | \| | \| | 0.61 |
| 29.250 | 0.00 | 0.20 | 0.068 | O | \| | \| | \| | \| | 0.60 |
| 29.333 | 0.00 | 0.20 | 0.067 | O | \| | \| | \| | \| | 0.59 |
| 29.417 | 0.00 | 0.19 | 0.066 | O | \| | \| | \| | \| | 0.58 |
| 29.500 | 0.00 | 0.19 | 0.064 | O | \| | \| | \| | \| | 0.57 |
| 29.583 | 0.00 | 0.19 | 0.063 | O | \| | \| | \| | \| | 0.56 |
| 29.667 | 0.00 | 0.18 | 0.062 | O | \| | \| | \| | \| | 0.54 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 29.750 | 0.00 | 0.18 | 0.060 | O | \| | \| | \| | \| | 0.53 |
| 29.833 | 0.00 | 0.17 | 0.059 | O | \| | \| | \| | \| | 0.52 |
| 29.917 | 0.00 | 0.17 | 0.058 | O | \| | \| | \| | \| | 0.51 |
| 30.000 | 0.00 | 0.17 | 0.057 | O | \| | \| | \| | \| | 0.50 |
| 30.083 | 0.00 | 0.16 | 0.056 | O | \| | \| | \| | \| | 0.49 |
| 30.167 | 0.00 | 0.16 | 0.055 | O | \| | \| | \| | \| | 0.48 |
| 30.250 | 0.00 | 0.16 | 0.053 | O | \| | \| | \| | \| | 0.47 |
| 30.333 | 0.00 | 0.15 | 0.052 | O | \| | \| | \| | \| | 0.46 |
| 30.417 | 0.00 | 0.15 | 0.051 | O | \| | \| | \| | \| | 0.45 |
| 30.500 | 0.00 | 0.15 | 0.050 | O | \| | \| | \| | \| | 0.44 |
| 30.583 | 0.00 | 0.15 | 0.049 | O | \| | \| | \| | \| | 0.44 |
| 30.667 | 0.00 | 0.14 | 0.048 | O | \| | \| | \| | \| | 0.43 |
| 30.750 | 0.00 | 0.14 | 0.047 | O | \| | \| | \| | \| | 0.42 |
| 30.833 | 0.00 | 0.14 | 0.046 | O | \| | \| | \| | \| | 0.41 |
| 30.917 | 0.00 | 0.13 | 0.045 | O | \| | \| | \| | \| | 0.40 |
| 31.000 | 0.00 | 0.13 | 0.045 | O | \| | \| | \| | \| | 0.39 |
| 31.083 | 0.00 | 0.13 | 0.044 | O | \| | \| | \| | \| | 0.39 |
| 31.167 | 0.00 | 0.13 | 0.043 | O | \| | \| | \| | \| | 0.38 |
| 31.250 | 0.00 | 0.12 | 0.042 | O | \| | \| | \| | \| | 0.37 |
| 31.333 | 0.00 | 0.12 | 0.041 | O | \| | \| | \| | \| | 0.36 |
| 31.417 | 0.00 | 0.12 | 0.040 | O | \| | \| | \| | \| | 0.36 |
| 31.500 | 0.00 | 0.12 | 0.039 | O | \| | \| | \| | \| | 0.35 |
| 31.583 | 0.00 | 0.11 | 0.039 | O | \| | \| | \| | \| | 0.34 |
| 31.667 | 0.00 | 0.11 | 0.038 | O | \| | \| | \| | \| | 0.33 |
| 31.750 | 0.00 | 0.11 | 0.037 | O | \| | \| | \| | \| | 0.33 |
| 31.833 | 0.00 | 0.11 | 0.036 | O | \| | \| | \| | \| | 0.32 |
| 31.917 | 0.00 | 0.10 | 0.036 | O | \| | \| | \| | \| | 0.31 |
| 32.000 | 0.00 | 0.10 | 0.035 | O | \| | \| | \| | \| | 0.31 |
| 32.083 | 0.00 | 0.10 | 0.034 | O | \| | \| | \| | \| | 0.30 |
| 32.167 | 0.00 | 0.10 | 0.034 | O | \| | \| | \| | \| | 0.30 |
| 32.250 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.29 |
| 32.333 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 32.417 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 32.500 | 0.00 | 0.09 | 0.031 | O | \| | \| | \| | \| | 0.27 |
| 32.583 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.27 |
| 32.667 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.26 |
| 32.750 | 0.00 | 0.09 | 0.029 | O | \| | \| | \| | \| | 0.26 |
| 32.833 | 0.00 | 0.08 | 0.029 | O | \| | \| | \| | \| | 0.25 |
| 32.917 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 33.000 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 33.083 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 33.167 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 33.250 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 33.333 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 33.417 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 33.500 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 33.583 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 33.667 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.21 |
| 33.750 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.20 |
| 33.833 | 0.00 | 0.07 | 0.022 | O | \| | \| | \| | \| | 0.20 |
| 33.917 | 0.00 | 0.06 | 0.022 | O | \| | \| | \| | \| | 0.19 |
| 34.000 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 34.083 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 34.167 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.18 |
| 34.250 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.18 |
| 34.333 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.17 |
| 34.417 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 34.500 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 34.583 | 0.00 | 0.05 | 0.019 | O | \| | \| | \| | \| | 0.16 |
| 34.667 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 34.750 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 34.833 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.15 |
| 34.917 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 35.000 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 35.083 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 35.167 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 35.250 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 35.333 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 35.417 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 35.500 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 35.583 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 35.667 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | 0.13 |
| 35.750 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | 0.12 |
| 35.833 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | 0.12 |
| 35.917 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.12 |
| 36.000 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.12 |
| 36.083 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.11 |
| 36.167 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.11 |
| 36.250 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.333 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.417 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.500 | 0.00 | 0.03 | 0.012 | O | \| | \| | \| | 0.10 |
| 36.583 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.667 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.750 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.833 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.917 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.09 |
| 37.000 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.083 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.167 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.250 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 37.333 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.08 |
| 37.417 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.500 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.583 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.667 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.750 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.833 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.917 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.000 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.083 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.167 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.250 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 38.333 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.07 |
| 38.417 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.500 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.583 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.667 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.750 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.833 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.917 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 39.000 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 39.083 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 39.167 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.250 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.333 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.417 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.500 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.583 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.667 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.750 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.833 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.917 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 40.000 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.083 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.167 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.250 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.333 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.417 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.500 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.583 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.667 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.750 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.833 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.917 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 41.000 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.083 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.167 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.250 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.333 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.417 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.500 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 41.583 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.667 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.750 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.833 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.917 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.000 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.083 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.167 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.250 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.333 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 42.417 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.500 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.583 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.667 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.750 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.833 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.917 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.000 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.083 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.167 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.250 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.667 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.750 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.833 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.917 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.000 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.083 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.167 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.250 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.500 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.583 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.667 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.750 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.833 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.917 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 45.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 47.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 49.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.750 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.833 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.917 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.333 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.417 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.750 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.833 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.917 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 51.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |

**********HYDROGRAPH DATA**********

Number of intervals = 613
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 5.848 (CFS)
Total volume = 2.584 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

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# Flood Routing Analysis: Developed Condition
# (10 yr Storm Event)

```
                FLOOD HYDROGRAPH ROUTING PROGRAM
          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018
                      Study date: 07/01/23


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


CHAMBER ROUTING
CONCO INDUSTRIAL
10-YR STORM EVENT

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


Program License Serial Number 6484

------------------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: CON1.rte
*****************************HYDROGRAPH DATA****************************
               Number of intervals =   294
               Time interval =    5.0 (Min.)
               Maximum/Peak flow rate =       14.597 (CFS)
               Total volume =       2.122 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** RETARDING BASIN ROUTING ****
________________________________________________________________________

User entry of depth-outflow-storage data
------------------------------------------------------------------------
Total number of inflow hydrograph intervals = 294
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   1.500      0.170      0.500      0.168        0.172
   3.000      0.390      1.500      0.385        0.395
   4.500      0.680      4.300      0.665        0.695
   6.000      0.900      8.000      0.872        0.928
   6.700      0.960      8.700      0.930        0.990
------------------------------------------------------------------------
               Hydrograph Detention Basin Routing
------------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
------------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0       3.6    7.30   10.95   14.60 (Ft.)
 0.083    0.02    0.00      0.000  O       |       |       |       |     0.00
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0.167 | 0.14 | 0.00 | 0.001 | O | | | | 0.01 |
| 0.250 | 0.33 | 0.01 | 0.002 | O | | | | 0.02 |
| 0.333 | 0.42 | 0.01 | 0.005 | O | | | | 0.04 |
| 0.417 | 0.45 | 0.02 | 0.008 | O | | | | 0.07 |
| 0.500 | 0.46 | 0.03 | 0.011 | OI | | | | 0.09 |
| 0.583 | 0.46 | 0.04 | 0.013 | OI | | | | 0.12 |
| 0.667 | 0.47 | 0.05 | 0.016 | OI | | | | 0.14 |
| 0.750 | 0.47 | 0.06 | 0.019 | OI | | | | 0.17 |
| 0.833 | 0.47 | 0.06 | 0.022 | OI | | | | 0.19 |
| 0.917 | 0.47 | 0.07 | 0.025 | OI | | | | 0.22 |
| 1.000 | 0.47 | 0.08 | 0.028 | OI | | | | 0.24 |
| 1.083 | 0.47 | 0.09 | 0.030 | OI | | | | 0.27 |
| 1.167 | 0.47 | 0.10 | 0.033 | OI | | | | 0.29 |
| 1.250 | 0.48 | 0.10 | 0.035 | OI | | | | 0.31 |
| 1.333 | 0.48 | 0.11 | 0.038 | OI | | | | 0.33 |
| 1.417 | 0.48 | 0.12 | 0.040 | OI | | | | 0.36 |
| 1.500 | 0.48 | 0.13 | 0.043 | OI | | | | 0.38 |
| 1.583 | 0.48 | 0.13 | 0.045 | OI | | | | 0.40 |
| 1.667 | 0.48 | 0.14 | 0.048 | OI | | | | 0.42 |
| 1.750 | 0.49 | 0.15 | 0.050 | OI | | | | 0.44 |
| 1.833 | 0.49 | 0.15 | 0.052 | OI | | | | 0.46 |
| 1.917 | 0.49 | 0.16 | 0.055 | OI | | | | 0.48 |
| 2.000 | 0.49 | 0.17 | 0.057 | OI | | | | 0.50 |
| 2.083 | 0.49 | 0.17 | 0.059 | OI | | | | 0.52 |
| 2.167 | 0.49 | 0.18 | 0.061 | OI | | | | 0.54 |
| 2.250 | 0.50 | 0.19 | 0.063 | OI | | | | 0.56 |
| 2.333 | 0.50 | 0.19 | 0.066 | OI | | | | 0.58 |
| 2.417 | 0.50 | 0.20 | 0.068 | OI | | | | 0.60 |
| 2.500 | 0.50 | 0.20 | 0.070 | OI | | | | 0.61 |
| 2.583 | 0.50 | 0.21 | 0.072 | OI | | | | 0.63 |
| 2.667 | 0.50 | 0.22 | 0.074 | OI | | | | 0.65 |
| 2.750 | 0.51 | 0.22 | 0.076 | OI | | | | 0.67 |
| 2.833 | 0.51 | 0.23 | 0.078 | OI | | | | 0.68 |
| 2.917 | 0.51 | 0.23 | 0.079 | OI | | | | 0.70 |
| 3.000 | 0.51 | 0.24 | 0.081 | OI | | | | 0.72 |
| 3.083 | 0.51 | 0.24 | 0.083 | OI | | | | 0.73 |
| 3.167 | 0.51 | 0.25 | 0.085 | OI | | | | 0.75 |
| 3.250 | 0.52 | 0.26 | 0.087 | OI | | | | 0.77 |
| 3.333 | 0.52 | 0.26 | 0.089 | OI | | | | 0.78 |
| 3.417 | 0.52 | 0.27 | 0.090 | OI | | | | 0.80 |
| 3.500 | 0.52 | 0.27 | 0.092 | OI | | | | 0.81 |
| 3.583 | 0.52 | 0.28 | 0.094 | OI | | | | 0.83 |
| 3.667 | 0.53 | 0.28 | 0.096 | OI | | | | 0.84 |
| 3.750 | 0.53 | 0.29 | 0.097 | OI | | | | 0.86 |
| 3.833 | 0.53 | 0.29 | 0.099 | OI | | | | 0.87 |
| 3.917 | 0.53 | 0.30 | 0.101 | OI | | | | 0.89 |
| 4.000 | 0.53 | 0.30 | 0.102 | OI | | | | 0.90 |
| 4.083 | 0.54 | 0.31 | 0.104 | OI | | | | 0.92 |
| 4.167 | 0.54 | 0.31 | 0.105 | OI | | | | 0.93 |
| 4.250 | 0.54 | 0.31 | 0.107 | OI | | | | 0.94 |
| 4.333 | 0.54 | 0.32 | 0.108 | OI | | | | 0.96 |
| 4.417 | 0.54 | 0.32 | 0.110 | OI | | | | 0.97 |
| 4.500 | 0.55 | 0.33 | 0.111 | OI | | | | 0.98 |
| 4.583 | 0.55 | 0.33 | 0.113 | OI | | | | 1.00 |
| 4.667 | 0.55 | 0.34 | 0.114 | OI | | | | 1.01 |
| 4.750 | 0.55 | 0.34 | 0.116 | OI | | | | 1.02 |
| 4.833 | 0.56 | 0.35 | 0.117 | OI | | | | 1.04 |
| 4.917 | 0.56 | 0.35 | 0.119 | OI | | | | 1.05 |
| 5.000 | 0.56 | 0.35 | 0.120 | OI | | | | 1.06 |
| 5.083 | 0.56 | 0.36 | 0.122 | OI | | | | 1.07 |
| 5.167 | 0.57 | 0.36 | 0.123 | OI | | | | 1.09 |
| 5.250 | 0.57 | 0.37 | 0.124 | OI | | | | 1.10 |
| 5.333 | 0.57 | 0.37 | 0.126 | OI | | | | 1.11 |
| 5.417 | 0.57 | 0.37 | 0.127 | OI | | | | 1.12 |
| 5.500 | 0.57 | 0.38 | 0.129 | OI | | | | 1.13 |
| 5.583 | 0.58 | 0.38 | 0.130 | OI | | | | 1.15 |
| 5.667 | 0.58 | 0.39 | 0.131 | OI | | | | 1.16 |
| 5.750 | 0.58 | 0.39 | 0.133 | OI | | | | 1.17 |
| 5.833 | 0.59 | 0.39 | 0.134 | OI | | | | 1.18 |
| 5.917 | 0.59 | 0.40 | 0.135 | OI | | | | 1.19 |
| 6.000 | 0.59 | 0.40 | 0.137 | OI | | | | 1.20 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.083 | 0.59 | 0.41 | 0.138 | OI | | | | | 1.22 |
| 6.167 | 0.60 | 0.41 | 0.139 | OI | | | | | 1.23 |
| 6.250 | 0.60 | 0.41 | 0.140 | OI | | | | | 1.24 |
| 6.333 | 0.60 | 0.42 | 0.142 | OI | | | | | 1.25 |
| 6.417 | 0.60 | 0.42 | 0.143 | OI | | | | | 1.26 |
| 6.500 | 0.61 | 0.42 | 0.144 | OI | | | | | 1.27 |
| 6.583 | 0.61 | 0.43 | 0.145 | OI | | | | | 1.28 |
| 6.667 | 0.61 | 0.43 | 0.147 | OI | | | | | 1.29 |
| 6.750 | 0.62 | 0.44 | 0.148 | OI | | | | | 1.31 |
| 6.833 | 0.62 | 0.44 | 0.149 | OI | | | | | 1.32 |
| 6.917 | 0.62 | 0.44 | 0.150 | OI | | | | | 1.33 |
| 7.000 | 0.63 | 0.45 | 0.152 | OI | | | | | 1.34 |
| 7.083 | 0.63 | 0.45 | 0.153 | OI | | | | | 1.35 |
| 7.167 | 0.63 | 0.45 | 0.154 | OI | | | | | 1.36 |
| 7.250 | 0.64 | 0.46 | 0.155 | \|O | | | | | 1.37 |
| 7.333 | 0.64 | 0.46 | 0.157 | \|O | | | | | 1.38 |
| 7.417 | 0.64 | 0.46 | 0.158 | \|O | | | | | 1.39 |
| 7.500 | 0.65 | 0.47 | 0.159 | \|O | | | | | 1.40 |
| 7.583 | 0.65 | 0.47 | 0.160 | \|O | | | | | 1.41 |
| 7.667 | 0.65 | 0.48 | 0.162 | \|O | | | | | 1.43 |
| 7.750 | 0.66 | 0.48 | 0.163 | \|O | | | | | 1.44 |
| 7.833 | 0.66 | 0.48 | 0.164 | \|O | | | | | 1.45 |
| 7.917 | 0.66 | 0.49 | 0.165 | \|O | | | | | 1.46 |
| 8.000 | 0.67 | 0.49 | 0.166 | \|O | | | | | 1.47 |
| 8.083 | 0.67 | 0.49 | 0.168 | \|O | | | | | 1.48 |
| 8.167 | 0.68 | 0.50 | 0.169 | \|O | | | | | 1.49 |
| 8.250 | 0.68 | 0.50 | 0.170 | \|O | | | | | 1.50 |
| 8.333 | 0.68 | 0.51 | 0.171 | \|O | | | | | 1.51 |
| 8.417 | 0.69 | 0.51 | 0.173 | \|O | | | | | 1.52 |
| 8.500 | 0.69 | 0.52 | 0.174 | \|O | | | | | 1.53 |
| 8.583 | 0.70 | 0.52 | 0.175 | \|O | | | | | 1.53 |
| 8.667 | 0.70 | 0.53 | 0.176 | \|O | | | | | 1.54 |
| 8.750 | 0.70 | 0.53 | 0.177 | \|O | | | | | 1.55 |
| 8.833 | 0.71 | 0.54 | 0.179 | \|O | | | | | 1.56 |
| 8.917 | 0.71 | 0.54 | 0.180 | \|O | | | | | 1.57 |
| 9.000 | 0.72 | 0.55 | 0.181 | \|O | | | | | 1.57 |
| 9.083 | 0.72 | 0.55 | 0.182 | \|O | | | | | 1.58 |
| 9.167 | 0.73 | 0.56 | 0.183 | \|O | | | | | 1.59 |
| 9.250 | 0.73 | 0.57 | 0.184 | \|O | | | | | 1.60 |
| 9.333 | 0.74 | 0.57 | 0.185 | \|O | | | | | 1.61 |
| 9.417 | 0.74 | 0.58 | 0.187 | \|O | | | | | 1.61 |
| 9.500 | 0.75 | 0.58 | 0.188 | \|O | | | | | 1.62 |
| 9.583 | 0.75 | 0.59 | 0.189 | \|O | | | | | 1.63 |
| 9.667 | 0.76 | 0.59 | 0.190 | \|O | | | | | 1.64 |
| 9.750 | 0.76 | 0.60 | 0.191 | \|O | | | | | 1.64 |
| 9.833 | 0.77 | 0.60 | 0.192 | \|O | | | | | 1.65 |
| 9.917 | 0.78 | 0.61 | 0.194 | \|O | | | | | 1.66 |
| 10.000 | 0.78 | 0.61 | 0.195 | \|O | | | | | 1.67 |
| 10.083 | 0.79 | 0.62 | 0.196 | \|O | | | | | 1.68 |
| 10.167 | 0.79 | 0.62 | 0.197 | \|O | | | | | 1.68 |
| 10.250 | 0.80 | 0.63 | 0.198 | \|O | | | | | 1.69 |
| 10.333 | 0.81 | 0.63 | 0.199 | \|O | | | | | 1.70 |
| 10.417 | 0.81 | 0.64 | 0.201 | \|O | | | | | 1.71 |
| 10.500 | 0.82 | 0.64 | 0.202 | \|O | | | | | 1.72 |
| 10.583 | 0.83 | 0.65 | 0.203 | \|O | | | | | 1.72 |
| 10.667 | 0.83 | 0.66 | 0.204 | \|O | | | | | 1.73 |
| 10.750 | 0.84 | 0.66 | 0.205 | \|O | | | | | 1.74 |
| 10.833 | 0.85 | 0.67 | 0.207 | \|O | | | | | 1.75 |
| 10.917 | 0.85 | 0.67 | 0.208 | \|O | | | | | 1.76 |
| 11.000 | 0.86 | 0.68 | 0.209 | \|O | | | | | 1.77 |
| 11.083 | 0.87 | 0.68 | 0.210 | \|O | | | | | 1.78 |
| 11.167 | 0.88 | 0.69 | 0.212 | \|O | | | | | 1.78 |
| 11.250 | 0.89 | 0.70 | 0.213 | \|O | | | | | 1.79 |
| 11.333 | 0.89 | 0.70 | 0.214 | \|O | | | | | 1.80 |
| 11.417 | 0.90 | 0.71 | 0.216 | \|O | | | | | 1.81 |
| 11.500 | 0.91 | 0.71 | 0.217 | \|O | | | | | 1.82 |
| 11.583 | 0.92 | 0.72 | 0.218 | \|OI | | | | | 1.83 |
| 11.667 | 0.93 | 0.73 | 0.220 | \|OI | | | | | 1.84 |
| 11.750 | 0.94 | 0.73 | 0.221 | \|OI | | | | | 1.85 |
| 11.833 | 0.95 | 0.74 | 0.223 | \|OI | | | | | 1.86 |
| 11.917 | 0.96 | 0.75 | 0.224 | \|OI | | | | | 1.87 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12.000 | 0.97 | 0.75 | 0.226 | OI | | | | 1.88 |
| 12.083 | 0.99 | 0.76 | 0.227 | OI | | | | 1.89 |
| 12.167 | 1.05 | 0.77 | 0.229 | OI | | | | 1.90 |
| 12.250 | 1.14 | 0.78 | 0.231 | OI | | | | 1.92 |
| 12.333 | 1.19 | 0.79 | 0.234 | OI | | | | 1.93 |
| 12.417 | 1.21 | 0.80 | 0.237 | OI | | | | 1.95 |
| 12.500 | 1.23 | 0.82 | 0.239 | OI | | | | 1.97 |
| 12.583 | 1.24 | 0.83 | 0.242 | OI | | | | 1.99 |
| 12.667 | 1.26 | 0.84 | 0.245 | OI | | | | 2.01 |
| 12.750 | 1.27 | 0.85 | 0.248 | OI | | | | 2.03 |
| 12.833 | 1.29 | 0.87 | 0.251 | OI | | | | 2.05 |
| 12.917 | 1.30 | 0.88 | 0.254 | OI | | | | 2.07 |
| 13.000 | 1.32 | 0.89 | 0.257 | OI | | | | 2.09 |
| 13.083 | 1.34 | 0.91 | 0.260 | OI | | | | 2.11 |
| 13.167 | 1.35 | 0.92 | 0.263 | O | | | | 2.13 |
| 13.250 | 1.37 | 0.93 | 0.266 | OI | | | | 2.15 |
| 13.333 | 1.39 | 0.95 | 0.269 | OI | | | | 2.17 |
| 13.417 | 1.41 | 0.96 | 0.272 | OI | | | | 2.19 |
| 13.500 | 1.43 | 0.98 | 0.275 | OI | | | | 2.21 |
| 13.583 | 1.45 | 0.99 | 0.278 | OI | | | | 2.24 |
| 13.667 | 1.47 | 1.01 | 0.281 | OI | | | | 2.26 |
| 13.750 | 1.50 | 1.02 | 0.284 | OI | | | | 2.28 |
| 13.833 | 1.52 | 1.03 | 0.288 | OI | | | | 2.30 |
| 13.917 | 1.55 | 1.05 | 0.291 | OI | | | | 2.33 |
| 14.000 | 1.58 | 1.07 | 0.295 | OI | | | | 2.35 |
| 14.083 | 1.61 | 1.08 | 0.298 | OI | | | | 2.37 |
| 14.167 | 1.64 | 1.10 | 0.302 | OI | | | | 2.40 |
| 14.250 | 1.67 | 1.12 | 0.306 | OI | | | | 2.42 |
| 14.333 | 1.70 | 1.13 | 0.309 | OI | | | | 2.45 |
| 14.417 | 1.74 | 1.15 | 0.313 | OI | | | | 2.48 |
| 14.500 | 1.78 | 1.17 | 0.318 | OI | | | | 2.51 |
| 14.583 | 1.83 | 1.19 | 0.322 | O I | | | | 2.54 |
| 14.667 | 1.87 | 1.21 | 0.326 | O I | | | | 2.57 |
| 14.750 | 1.92 | 1.23 | 0.331 | O I | | | | 2.60 |
| 14.833 | 1.98 | 1.25 | 0.336 | O I | | | | 2.63 |
| 14.917 | 2.04 | 1.28 | 0.341 | O I | | | | 2.67 |
| 15.000 | 2.10 | 1.30 | 0.346 | O I | | | | 2.70 |
| 15.083 | 2.17 | 1.33 | 0.352 | O I | | | | 2.74 |
| 15.167 | 2.25 | 1.35 | 0.358 | O I | | | | 2.78 |
| 15.250 | 2.34 | 1.38 | 0.364 | O I | | | | 2.82 |
| 15.333 | 2.45 | 1.41 | 0.371 | O I | | | | 2.87 |
| 15.417 | 2.53 | 1.45 | 0.378 | O I | | | | 2.92 |
| 15.500 | 2.50 | 1.48 | 0.386 | O I | | | | 2.97 |
| 15.583 | 2.41 | 1.52 | 0.392 | O I | | | | 3.01 |
| 15.667 | 2.48 | 1.58 | 0.398 | O I | | | | 3.04 |
| 15.750 | 2.69 | 1.65 | 0.405 | O I | | | | 3.08 |
| 15.833 | 3.02 | 1.72 | 0.413 | O I | | | | 3.12 |
| 15.917 | 3.54 | 1.82 | 0.424 | O I | | | | 3.17 |
| 16.000 | 4.53 | 1.97 | 0.438 | O I | | | | 3.25 |
| 16.083 | 7.04 | 2.21 | 0.464 | O I | | | | 3.38 |
| 16.167 | 12.47 | 2.70 | 0.514 | O | | | I | 3.64 |
| 16.250 | 14.60 | 3.39 | 0.586 | O | | | I | 4.02 |
| 16.333 | 9.15 | 3.94 | 0.643 | O | I | | | 4.31 |
| 16.417 | 5.01 | 4.14 | 0.664 | OI | | | | 4.42 |
| 16.500 | 3.31 | 4.14 | 0.664 | I O | | | | 4.42 |
| 16.583 | 2.97 | 4.08 | 0.657 | I O | | | | 4.38 |
| 16.667 | 2.52 | 3.99 | 0.648 | I O | | | | 4.34 |
| 16.750 | 2.32 | 3.89 | 0.638 | I O | | | | 4.28 |
| 16.833 | 2.16 | 3.79 | 0.627 | I O | | | | 4.22 |
| 16.917 | 2.03 | 3.68 | 0.615 | I O | | | | 4.17 |
| 17.000 | 1.91 | 3.57 | 0.604 | I O | | | | 4.11 |
| 17.083 | 1.82 | 3.46 | 0.593 | I O | | | | 4.05 |
| 17.167 | 1.74 | 3.35 | 0.582 | I O | | | | 3.99 |
| 17.250 | 1.66 | 3.24 | 0.571 | I O | | | | 3.93 |
| 17.333 | 1.60 | 3.14 | 0.560 | I O | | | | 3.88 |
| 17.417 | 1.54 | 3.04 | 0.549 | I O | | | | 3.82 |
| 17.500 | 1.49 | 2.94 | 0.539 | I O | | | | 3.77 |
| 17.583 | 1.45 | 2.85 | 0.529 | I O | | | | 3.72 |
| 17.667 | 1.41 | 2.75 | 0.520 | I O | | | | 3.67 |
| 17.750 | 1.37 | 2.67 | 0.511 | I O | | | | 3.62 |
| 17.833 | 1.33 | 2.58 | 0.502 | I O | | | | 3.58 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 17.917 | 1.30 | 2.50 | 0.494 | \| I  O \| | \| | \| | \| | 3.54 |
| 18.000 | 1.27 | 2.42 | 0.485 | \| I  O \| | \| | \| | \| | 3.49 |
| 18.083 | 1.23 | 2.35 | 0.478 | \| I  O \| | \| | \| | \| | 3.45 |
| 18.167 | 1.16 | 2.27 | 0.470 | \| I O \| | \| | \| | \| | 3.41 |
| 18.250 | 1.06 | 2.20 | 0.462 | \| I O \| | \| | \| | \| | 3.37 |
| 18.333 | 1.00 | 2.12 | 0.454 | \| I O \| | \| | \| | \| | 3.33 |
| 18.417 | 0.96 | 2.05 | 0.447 | \| I O \| | \| | \| | \| | 3.29 |
| 18.500 | 0.94 | 1.98 | 0.439 | \| I O \| | \| | \| | \| | 3.26 |
| 18.583 | 0.92 | 1.91 | 0.433 | \| I O \| | \| | \| | \| | 3.22 |
| 18.667 | 0.90 | 1.85 | 0.426 | \|I  O \| | \| | \| | \| | 3.19 |
| 18.750 | 0.88 | 1.78 | 0.419 | \|I O \| | \| | \| | \| | 3.15 |
| 18.833 | 0.87 | 1.73 | 0.413 | \|I O \| | \| | \| | \| | 3.12 |
| 18.917 | 0.85 | 1.67 | 0.408 | \|I O \| | \| | \| | \| | 3.09 |
| 19.000 | 0.84 | 1.62 | 0.402 | \|I O \| | \| | \| | \| | 3.06 |
| 19.083 | 0.82 | 1.57 | 0.397 | \|I O \| | \| | \| | \| | 3.04 |
| 19.167 | 0.81 | 1.52 | 0.392 | \|I O \| | \| | \| | \| | 3.01 |
| 19.250 | 0.80 | 1.49 | 0.387 | \|I O \| | \| | \| | \| | 2.98 |
| 19.333 | 0.79 | 1.47 | 0.382 | \|I O \| | \| | \| | \| | 2.95 |
| 19.417 | 0.77 | 1.44 | 0.378 | \|I O \| | \| | \| | \| | 2.92 |
| 19.500 | 0.76 | 1.42 | 0.373 | \|I O \| | \| | \| | \| | 2.88 |
| 19.583 | 0.75 | 1.40 | 0.369 | \|I O \| | \| | \| | \| | 2.85 |
| 19.667 | 0.74 | 1.38 | 0.364 | \|I O \| | \| | \| | \| | 2.82 |
| 19.750 | 0.73 | 1.36 | 0.360 | \|IO \| | \| | \| | \| | 2.79 |
| 19.833 | 0.72 | 1.34 | 0.355 | \|IO \| | \| | \| | \| | 2.76 |
| 19.917 | 0.71 | 1.32 | 0.351 | \|IO \| | \| | \| | \| | 2.74 |
| 20.000 | 0.70 | 1.30 | 0.347 | \|IO \| | \| | \| | \| | 2.71 |
| 20.083 | 0.69 | 1.29 | 0.343 | \|IO \| | \| | \| | \| | 2.68 |
| 20.167 | 0.69 | 1.27 | 0.339 | \|IO \| | \| | \| | \| | 2.65 |
| 20.250 | 0.68 | 1.25 | 0.335 | \|IO \| | \| | \| | \| | 2.62 |
| 20.333 | 0.67 | 1.23 | 0.331 | \|IO \| | \| | \| | \| | 2.60 |
| 20.417 | 0.66 | 1.21 | 0.327 | \|IO \| | \| | \| | \| | 2.57 |
| 20.500 | 0.66 | 1.20 | 0.323 | \|IO \| | \| | \| | \| | 2.55 |
| 20.583 | 0.65 | 1.18 | 0.320 | \|IO \| | \| | \| | \| | 2.52 |
| 20.667 | 0.64 | 1.16 | 0.316 | \|IO \| | \| | \| | \| | 2.50 |
| 20.750 | 0.63 | 1.15 | 0.313 | \|IO \| | \| | \| | \| | 2.47 |
| 20.833 | 0.63 | 1.13 | 0.309 | \|IO \| | \| | \| | \| | 2.45 |
| 20.917 | 0.62 | 1.12 | 0.306 | \|IO \| | \| | \| | \| | 2.42 |
| 21.000 | 0.62 | 1.10 | 0.302 | \|IO \| | \| | \| | \| | 2.40 |
| 21.083 | 0.61 | 1.09 | 0.299 | \|IO \| | \| | \| | \| | 2.38 |
| 21.167 | 0.60 | 1.07 | 0.296 | \|IO \| | \| | \| | \| | 2.36 |
| 21.250 | 0.60 | 1.06 | 0.292 | \|IO \| | \| | \| | \| | 2.33 |
| 21.333 | 0.59 | 1.04 | 0.289 | \|IO \| | \| | \| | \| | 2.31 |
| 21.417 | 0.59 | 1.03 | 0.286 | \|IO \| | \| | \| | \| | 2.29 |
| 21.500 | 0.58 | 1.01 | 0.283 | \|IO \| | \| | \| | \| | 2.27 |
| 21.583 | 0.58 | 1.00 | 0.280 | \|IO \| | \| | \| | \| | 2.25 |
| 21.667 | 0.57 | 0.99 | 0.277 | \|IO \| | \| | \| | \| | 2.23 |
| 21.750 | 0.57 | 0.98 | 0.275 | \|IO \| | \| | \| | \| | 2.21 |
| 21.833 | 0.56 | 0.96 | 0.272 | \|IO \| | \| | \| | \| | 2.19 |
| 21.917 | 0.56 | 0.95 | 0.269 | \|IO \| | \| | \| | \| | 2.18 |
| 22.000 | 0.55 | 0.94 | 0.266 | \|IO \| | \| | \| | \| | 2.16 |
| 22.083 | 0.55 | 0.93 | 0.264 | \|IO \| | \| | \| | \| | 2.14 |
| 22.167 | 0.54 | 0.91 | 0.261 | \|IO \| | \| | \| | \| | 2.12 |
| 22.250 | 0.54 | 0.90 | 0.259 | \|O \| | \| | \| | \| | 2.10 |
| 22.333 | 0.54 | 0.89 | 0.256 | \|O \| | \| | \| | \| | 2.09 |
| 22.417 | 0.53 | 0.88 | 0.254 | \|O \| | \| | \| | \| | 2.07 |
| 22.500 | 0.53 | 0.87 | 0.251 | \|O \| | \| | \| | \| | 2.05 |
| 22.583 | 0.52 | 0.86 | 0.249 | \|O \| | \| | \| | \| | 2.04 |
| 22.667 | 0.52 | 0.85 | 0.247 | \|O \| | \| | \| | \| | 2.02 |
| 22.750 | 0.52 | 0.84 | 0.244 | \|O \| | \| | \| | \| | 2.01 |
| 22.833 | 0.51 | 0.83 | 0.242 | \|O \| | \| | \| | \| | 1.99 |
| 22.917 | 0.51 | 0.82 | 0.240 | \|O \| | \| | \| | \| | 1.98 |
| 23.000 | 0.50 | 0.81 | 0.238 | \|O \| | \| | \| | \| | 1.96 |
| 23.083 | 0.50 | 0.80 | 0.236 | \|O \| | \| | \| | \| | 1.95 |
| 23.167 | 0.50 | 0.79 | 0.234 | \|O \| | \| | \| | \| | 1.94 |
| 23.250 | 0.49 | 0.78 | 0.232 | \|O \| | \| | \| | \| | 1.92 |
| 23.333 | 0.49 | 0.77 | 0.230 | \|O \| | \| | \| | \| | 1.91 |
| 23.417 | 0.49 | 0.76 | 0.228 | \|O \| | \| | \| | \| | 1.90 |
| 23.500 | 0.49 | 0.76 | 0.226 | \|O \| | \| | \| | \| | 1.88 |
| 23.583 | 0.48 | 0.75 | 0.224 | \|O \| | \| | \| | \| | 1.87 |
| 23.667 | 0.48 | 0.74 | 0.222 | \|O \| | \| | \| | \| | 1.86 |
| 23.750 | 0.48 | 0.73 | 0.221 | \|O \| | \| | \| | \| | 1.85 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23.833 | 0.47 | 0.72 | 0.219 | \|O | \| | \| | \| | \| | 1.83 |
| 23.917 | 0.47 | 0.71 | 0.217 | \|O | \| | \| | \| | \| | 1.82 |
| 24.000 | 0.47 | 0.71 | 0.216 | \|O | \| | \| | \| | \| | 1.81 |
| 24.083 | 0.44 | 0.70 | 0.214 | IO | \| | \| | \| | \| | 1.80 |
| 24.167 | 0.32 | 0.69 | 0.212 | IO | \| | \| | \| | \| | 1.78 |
| 24.250 | 0.14 | 0.68 | 0.209 | IO | \| | \| | \| | \| | 1.76 |
| 24.333 | 0.04 | 0.66 | 0.205 | IO | \| | \| | \| | \| | 1.74 |
| 24.417 | 0.01 | 0.64 | 0.200 | IO | \| | \| | \| | \| | 1.71 |
| 24.500 | 0.01 | 0.62 | 0.196 | IO | \| | \| | \| | \| | 1.68 |
| 24.583 | 0.00 | 0.60 | 0.192 | IO | \| | \| | \| | \| | 1.65 |
| 24.667 | 0.00 | 0.58 | 0.188 | IO | \| | \| | \| | \| | 1.62 |
| 24.750 | 0.00 | 0.56 | 0.184 | IO | \| | \| | \| | \| | 1.59 |
| 24.833 | 0.00 | 0.55 | 0.180 | IO | \| | \| | \| | \| | 1.57 |
| 24.917 | 0.00 | 0.53 | 0.176 | IO | \| | \| | \| | \| | 1.54 |
| 25.000 | 0.00 | 0.51 | 0.173 | IO | \| | \| | \| | \| | 1.52 |
| 25.083 | 0.00 | 0.50 | 0.169 | IO | \| | \| | \| | \| | 1.49 |
| 25.167 | 0.00 | 0.49 | 0.166 | IO | \| | \| | \| | \| | 1.46 |
| 25.250 | 0.00 | 0.48 | 0.163 | IO | \| | \| | \| | \| | 1.43 |
| 25.333 | 0.00 | 0.47 | 0.159 | IO | \| | \| | \| | \| | 1.41 |
| 25.417 | 0.00 | 0.46 | 0.156 | IO | \| | \| | \| | \| | 1.38 |
| 25.500 | 0.00 | 0.45 | 0.153 | O | \| | \| | \| | \| | 1.35 |
| 25.583 | 0.00 | 0.44 | 0.150 | O | \| | \| | \| | \| | 1.32 |
| 25.667 | 0.00 | 0.43 | 0.147 | O | \| | \| | \| | \| | 1.30 |
| 25.750 | 0.00 | 0.42 | 0.144 | O | \| | \| | \| | \| | 1.27 |
| 25.833 | 0.00 | 0.41 | 0.141 | O | \| | \| | \| | \| | 1.24 |
| 25.917 | 0.00 | 0.41 | 0.138 | O | \| | \| | \| | \| | 1.22 |
| 26.000 | 0.00 | 0.40 | 0.135 | O | \| | \| | \| | \| | 1.20 |
| 26.083 | 0.00 | 0.39 | 0.133 | O | \| | \| | \| | \| | 1.17 |
| 26.167 | 0.00 | 0.38 | 0.130 | O | \| | \| | \| | \| | 1.15 |
| 26.250 | 0.00 | 0.38 | 0.128 | O | \| | \| | \| | \| | 1.13 |
| 26.333 | 0.00 | 0.37 | 0.125 | O | \| | \| | \| | \| | 1.10 |
| 26.417 | 0.00 | 0.36 | 0.122 | O | \| | \| | \| | \| | 1.08 |
| 26.500 | 0.00 | 0.35 | 0.120 | O | \| | \| | \| | \| | 1.06 |
| 26.583 | 0.00 | 0.35 | 0.118 | O | \| | \| | \| | \| | 1.04 |
| 26.667 | 0.00 | 0.34 | 0.115 | O | \| | \| | \| | \| | 1.02 |
| 26.750 | 0.00 | 0.33 | 0.113 | O | \| | \| | \| | \| | 1.00 |
| 26.833 | 0.00 | 0.33 | 0.111 | O | \| | \| | \| | \| | 0.98 |
| 26.917 | 0.00 | 0.32 | 0.108 | O | \| | \| | \| | \| | 0.96 |
| 27.000 | 0.00 | 0.31 | 0.106 | O | \| | \| | \| | \| | 0.94 |
| 27.083 | 0.00 | 0.31 | 0.104 | O | \| | \| | \| | \| | 0.92 |
| 27.167 | 0.00 | 0.30 | 0.102 | O | \| | \| | \| | \| | 0.90 |
| 27.250 | 0.00 | 0.29 | 0.100 | O | \| | \| | \| | \| | 0.88 |
| 27.333 | 0.00 | 0.29 | 0.098 | O | \| | \| | \| | \| | 0.86 |
| 27.417 | 0.00 | 0.28 | 0.096 | O | \| | \| | \| | \| | 0.85 |
| 27.500 | 0.00 | 0.28 | 0.094 | O | \| | \| | \| | \| | 0.83 |
| 27.583 | 0.00 | 0.27 | 0.092 | O | \| | \| | \| | \| | 0.81 |
| 27.667 | 0.00 | 0.27 | 0.090 | O | \| | \| | \| | \| | 0.80 |
| 27.750 | 0.00 | 0.26 | 0.089 | O | \| | \| | \| | \| | 0.78 |
| 27.833 | 0.00 | 0.26 | 0.087 | O | \| | \| | \| | \| | 0.77 |
| 27.917 | 0.00 | 0.25 | 0.085 | O | \| | \| | \| | \| | 0.75 |
| 28.000 | 0.00 | 0.25 | 0.083 | O | \| | \| | \| | \| | 0.74 |
| 28.083 | 0.00 | 0.24 | 0.082 | O | \| | \| | \| | \| | 0.72 |
| 28.167 | 0.00 | 0.24 | 0.080 | O | \| | \| | \| | \| | 0.71 |
| 28.250 | 0.00 | 0.23 | 0.078 | O | \| | \| | \| | \| | 0.69 |
| 28.333 | 0.00 | 0.23 | 0.077 | O | \| | \| | \| | \| | 0.68 |
| 28.417 | 0.00 | 0.22 | 0.075 | O | \| | \| | \| | \| | 0.66 |
| 28.500 | 0.00 | 0.22 | 0.074 | O | \| | \| | \| | \| | 0.65 |
| 28.583 | 0.00 | 0.21 | 0.072 | O | \| | \| | \| | \| | 0.64 |
| 28.667 | 0.00 | 0.21 | 0.071 | O | \| | \| | \| | \| | 0.63 |
| 28.750 | 0.00 | 0.20 | 0.069 | O | \| | \| | \| | \| | 0.61 |
| 28.833 | 0.00 | 0.20 | 0.068 | O | \| | \| | \| | \| | 0.60 |
| 28.917 | 0.00 | 0.20 | 0.067 | O | \| | \| | \| | \| | 0.59 |
| 29.000 | 0.00 | 0.19 | 0.065 | O | \| | \| | \| | \| | 0.58 |
| 29.083 | 0.00 | 0.19 | 0.064 | O | \| | \| | \| | \| | 0.57 |
| 29.167 | 0.00 | 0.18 | 0.063 | O | \| | \| | \| | \| | 0.55 |
| 29.250 | 0.00 | 0.18 | 0.061 | O | \| | \| | \| | \| | 0.54 |
| 29.333 | 0.00 | 0.18 | 0.060 | O | \| | \| | \| | \| | 0.53 |
| 29.417 | 0.00 | 0.17 | 0.059 | O | \| | \| | \| | \| | 0.52 |
| 29.500 | 0.00 | 0.17 | 0.058 | O | \| | \| | \| | \| | 0.51 |
| 29.583 | 0.00 | 0.17 | 0.057 | O | \| | \| | \| | \| | 0.50 |
| 29.667 | 0.00 | 0.16 | 0.056 | O | \| | \| | \| | \| | 0.49 |

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|---|---|---|---|---|---|---|---|---|---|
| 29.750 | 0.00 | 0.16 | 0.054 | O | \| | \| | \| | \| | 0.48 |
| 29.833 | 0.00 | 0.16 | 0.053 | O | \| | \| | \| | \| | 0.47 |
| 29.917 | 0.00 | 0.15 | 0.052 | O | \| | \| | \| | \| | 0.46 |
| 30.000 | 0.00 | 0.15 | 0.051 | O | \| | \| | \| | \| | 0.45 |
| 30.083 | 0.00 | 0.15 | 0.050 | O | \| | \| | \| | \| | 0.44 |
| 30.167 | 0.00 | 0.14 | 0.049 | O | \| | \| | \| | \| | 0.43 |
| 30.250 | 0.00 | 0.14 | 0.048 | O | \| | \| | \| | \| | 0.43 |
| 30.333 | 0.00 | 0.14 | 0.047 | O | \| | \| | \| | \| | 0.42 |
| 30.417 | 0.00 | 0.14 | 0.046 | O | \| | \| | \| | \| | 0.41 |
| 30.500 | 0.00 | 0.13 | 0.045 | O | \| | \| | \| | \| | 0.40 |
| 30.583 | 0.00 | 0.13 | 0.044 | O | \| | \| | \| | \| | 0.39 |
| 30.667 | 0.00 | 0.13 | 0.044 | O | \| | \| | \| | \| | 0.38 |
| 30.750 | 0.00 | 0.13 | 0.043 | O | \| | \| | \| | \| | 0.38 |
| 30.833 | 0.00 | 0.12 | 0.042 | O | \| | \| | \| | \| | 0.37 |
| 30.917 | 0.00 | 0.12 | 0.041 | O | \| | \| | \| | \| | 0.36 |
| 31.000 | 0.00 | 0.12 | 0.040 | O | \| | \| | \| | \| | 0.35 |
| 31.083 | 0.00 | 0.12 | 0.039 | O | \| | \| | \| | \| | 0.35 |
| 31.167 | 0.00 | 0.11 | 0.039 | O | \| | \| | \| | \| | 0.34 |
| 31.250 | 0.00 | 0.11 | 0.038 | O | \| | \| | \| | \| | 0.33 |
| 31.333 | 0.00 | 0.11 | 0.037 | O | \| | \| | \| | \| | 0.33 |
| 31.417 | 0.00 | 0.11 | 0.036 | O | \| | \| | \| | \| | 0.32 |
| 31.500 | 0.00 | 0.10 | 0.036 | O | \| | \| | \| | \| | 0.31 |
| 31.583 | 0.00 | 0.10 | 0.035 | O | \| | \| | \| | \| | 0.31 |
| 31.667 | 0.00 | 0.10 | 0.034 | O | \| | \| | \| | \| | 0.30 |
| 31.750 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.30 |
| 31.833 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.29 |
| 31.917 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 32.000 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 32.083 | 0.00 | 0.09 | 0.031 | O | \| | \| | \| | \| | 0.27 |
| 32.167 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.27 |
| 32.250 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.26 |
| 32.333 | 0.00 | 0.09 | 0.029 | O | \| | \| | \| | \| | 0.26 |
| 32.417 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 32.500 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 32.583 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 32.667 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 32.750 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 32.833 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 32.917 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 33.000 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 33.083 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 33.167 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 33.250 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.21 |
| 33.333 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.20 |
| 33.417 | 0.00 | 0.07 | 0.022 | O | \| | \| | \| | \| | 0.20 |
| 33.500 | 0.00 | 0.06 | 0.022 | O | \| | \| | \| | \| | 0.19 |
| 33.583 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 33.667 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 33.750 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.18 |
| 33.833 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.18 |
| 33.917 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.17 |
| 34.000 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 34.083 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 34.167 | 0.00 | 0.05 | 0.019 | O | \| | \| | \| | \| | 0.16 |
| 34.250 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 34.333 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 34.417 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.15 |
| 34.500 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 34.583 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 34.667 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.15 |
| 34.750 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 34.833 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 34.917 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 35.000 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 35.083 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 35.167 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 35.250 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | \| | 0.13 |
| 35.333 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | \| | 0.12 |
| 35.417 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | \| | 0.12 |
| 35.500 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | \| | 0.12 |
| 35.583 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | \| | 0.12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 35.667 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.11 |
| 35.750 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | 0.11 |
| 35.833 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 35.917 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.000 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | 0.11 |
| 36.083 | 0.00 | 0.03 | 0.012 | O | \| | \| | \| | 0.10 |
| 36.167 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.250 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.333 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.417 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.500 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.09 |
| 36.583 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.667 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.750 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.833 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.917 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.08 |
| 37.000 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.083 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.167 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.250 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.333 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.417 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.500 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.583 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.667 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.750 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.833 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.917 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.07 |
| 38.000 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.083 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.167 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.250 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.333 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.417 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.500 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 38.583 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 38.667 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 38.750 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.833 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.917 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.000 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.083 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.167 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 39.250 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.333 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.417 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.500 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.583 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.667 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.750 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.833 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.917 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.000 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 40.083 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.167 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.250 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.333 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.417 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.500 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.583 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.667 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.750 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.833 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.917 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.000 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 41.083 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.167 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.250 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.333 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.417 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.500 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 41.583 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.667 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.750 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.833 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.03 |
| 41.917 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.000 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.083 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.167 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.250 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.333 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.417 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.667 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.750 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.833 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.917 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.000 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.083 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.167 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.250 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.667 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.750 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.833 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.917 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.000 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 44.083 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.167 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.250 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.333 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.417 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.500 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 47.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 49.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.333 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.417 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.750 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.833 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.917 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.333 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.417 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |

**********HYDROGRAPH DATA**********

Number of intervals = 608
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 4.143 (CFS)
Total volume = 2.122 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

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# Flood Routing Analysis: Developed Condition (5 yr Storm Event)

```
                FLOOD HYDROGRAPH ROUTING PROGRAM
          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018
                      Study date: 07/01/23


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


 CHAMBER ROUTING
 CONCO INDUSTRIAL
 5-YR STORM EVENT

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


 Program License Serial Number 6484

 ---------------------------------------------------------------------
 ********************* HYDROGRAPH INFORMATION **********************

                From study/file name: CON1.rte
 ****************************HYDROGRAPH DATA****************************
                Number of intervals =   294
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =       12.093 (CFS)
                Total volume =       1.769 (Ac.Ft)
        Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
 **********************************************************************



 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 Process from Point/Station        0.000 to Point/Station        1.000
 **** RETARDING BASIN ROUTING ****
 ________________________________________________________________________

 User entry of depth-outflow-storage data
 ---------------------------------------------------------------------
 Total number of inflow hydrograph intervals = 294
 Hydrograph time unit =  5.000 (Min.)
 Initial depth in storage basin =   0.00(Ft.)
 ---------------------------------------------------------------------
 ---------------------------------------------------------------------
 Initial basin depth =   0.00 (Ft.)
 Initial basin storage =      0.00 (Ac.Ft)
 Initial basin outflow =   0.00 (CFS)
 ---------------------------------------------------------------------
 ---------------------------------------------------------------------
 Depth vs. Storage and Depth vs. Discharge data:
  Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
      (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
 ---------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.500      0.170      0.500      0.168        0.172
    3.000      0.390      1.500      0.385        0.395
    4.500      0.680      4.300      0.665        0.695
    6.000      0.900      8.000      0.872        0.928
    6.700      0.960      8.700      0.930        0.990
 ---------------------------------------------------------------------
                Hydrograph Detention Basin Routing
 ---------------------------------------------------------------------

 Graph values: 'I'= unit inflow; 'O'=outflow at time shown
 ---------------------------------------------------------------------
  Time   Inflow  Outflow    Storage                                  Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0       3.0    6.05    9.07   12.09 (Ft.)
  0.083    0.02    0.00      0.000  O       |       |       |       |     0.00
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0.167 | 0.12 | 0.00 | 0.001 | O | | | | 0.00 |
| 0.250 | 0.27 | 0.01 | 0.002 | O | | | | 0.02 |
| 0.333 | 0.35 | 0.01 | 0.004 | O | | | | 0.03 |
| 0.417 | 0.37 | 0.02 | 0.006 | O | | | | 0.06 |
| 0.500 | 0.38 | 0.03 | 0.009 | OI | | | | 0.08 |
| 0.583 | 0.38 | 0.03 | 0.011 | OI | | | | 0.10 |
| 0.667 | 0.39 | 0.04 | 0.014 | OI | | | | 0.12 |
| 0.750 | 0.39 | 0.05 | 0.016 | OI | | | | 0.14 |
| 0.833 | 0.39 | 0.05 | 0.018 | OI | | | | 0.16 |
| 0.917 | 0.39 | 0.06 | 0.021 | OI | | | | 0.18 |
| 1.000 | 0.39 | 0.07 | 0.023 | OI | | | | 0.20 |
| 1.083 | 0.39 | 0.07 | 0.025 | OI | | | | 0.22 |
| 1.167 | 0.39 | 0.08 | 0.027 | OI | | | | 0.24 |
| 1.250 | 0.39 | 0.09 | 0.029 | OI | | | | 0.26 |
| 1.333 | 0.40 | 0.09 | 0.031 | OI | | | | 0.28 |
| 1.417 | 0.40 | 0.10 | 0.033 | OI | | | | 0.30 |
| 1.500 | 0.40 | 0.10 | 0.035 | OI | | | | 0.31 |
| 1.583 | 0.40 | 0.11 | 0.038 | OI | | | | 0.33 |
| 1.667 | 0.40 | 0.12 | 0.039 | OI | | | | 0.35 |
| 1.750 | 0.40 | 0.12 | 0.041 | OI | | | | 0.37 |
| 1.833 | 0.40 | 0.13 | 0.043 | OI | | | | 0.38 |
| 1.917 | 0.40 | 0.13 | 0.045 | OI | | | | 0.40 |
| 2.000 | 0.41 | 0.14 | 0.047 | OI | | | | 0.42 |
| 2.083 | 0.41 | 0.14 | 0.049 | OI | | | | 0.43 |
| 2.167 | 0.41 | 0.15 | 0.051 | OI | | | | 0.45 |
| 2.250 | 0.41 | 0.15 | 0.052 | OI | | | | 0.46 |
| 2.333 | 0.41 | 0.16 | 0.054 | OI | | | | 0.48 |
| 2.417 | 0.41 | 0.16 | 0.056 | OI | | | | 0.49 |
| 2.500 | 0.41 | 0.17 | 0.058 | OI | | | | 0.51 |
| 2.583 | 0.42 | 0.17 | 0.059 | OI | | | | 0.52 |
| 2.667 | 0.42 | 0.18 | 0.061 | OI | | | | 0.54 |
| 2.750 | 0.42 | 0.18 | 0.063 | OI | | | | 0.55 |
| 2.833 | 0.42 | 0.19 | 0.064 | OI | | | | 0.57 |
| 2.917 | 0.42 | 0.19 | 0.066 | OI | | | | 0.58 |
| 3.000 | 0.42 | 0.20 | 0.067 | OI | | | | 0.59 |
| 3.083 | 0.42 | 0.20 | 0.069 | OI | | | | 0.61 |
| 3.167 | 0.43 | 0.21 | 0.070 | OI | | | | 0.62 |
| 3.250 | 0.43 | 0.21 | 0.072 | OI | | | | 0.63 |
| 3.333 | 0.43 | 0.22 | 0.073 | OI | | | | 0.65 |
| 3.417 | 0.43 | 0.22 | 0.075 | OI | | | | 0.66 |
| 3.500 | 0.43 | 0.22 | 0.076 | OI | | | | 0.67 |
| 3.583 | 0.43 | 0.23 | 0.078 | OI | | | | 0.69 |
| 3.667 | 0.44 | 0.23 | 0.079 | OI | | | | 0.70 |
| 3.750 | 0.44 | 0.24 | 0.081 | OI | | | | 0.71 |
| 3.833 | 0.44 | 0.24 | 0.082 | OI | | | | 0.72 |
| 3.917 | 0.44 | 0.24 | 0.083 | OI | | | | 0.73 |
| 4.000 | 0.44 | 0.25 | 0.085 | OI | | | | 0.75 |
| 4.083 | 0.44 | 0.25 | 0.086 | OI | | | | 0.76 |
| 4.167 | 0.45 | 0.26 | 0.087 | OI | | | | 0.77 |
| 4.250 | 0.45 | 0.26 | 0.089 | OI | | | | 0.78 |
| 4.333 | 0.45 | 0.26 | 0.090 | OI | | | | 0.79 |
| 4.417 | 0.45 | 0.27 | 0.091 | OI | | | | 0.80 |
| 4.500 | 0.45 | 0.27 | 0.092 | OI | | | | 0.81 |
| 4.583 | 0.45 | 0.28 | 0.094 | OI | | | | 0.83 |
| 4.667 | 0.46 | 0.28 | 0.095 | OI | | | | 0.84 |
| 4.750 | 0.46 | 0.28 | 0.096 | OI | | | | 0.85 |
| 4.833 | 0.46 | 0.29 | 0.097 | OI | | | | 0.86 |
| 4.917 | 0.46 | 0.29 | 0.098 | OI | | | | 0.87 |
| 5.000 | 0.46 | 0.29 | 0.100 | OI | | | | 0.88 |
| 5.083 | 0.47 | 0.30 | 0.101 | OI | | | | 0.89 |
| 5.167 | 0.47 | 0.30 | 0.102 | OI | | | | 0.90 |
| 5.250 | 0.47 | 0.30 | 0.103 | OI | | | | 0.91 |
| 5.333 | 0.47 | 0.31 | 0.104 | OI | | | | 0.92 |
| 5.417 | 0.47 | 0.31 | 0.105 | OI | | | | 0.93 |
| 5.500 | 0.48 | 0.31 | 0.106 | OI | | | | 0.94 |
| 5.583 | 0.48 | 0.32 | 0.108 | OI | | | | 0.95 |
| 5.667 | 0.48 | 0.32 | 0.109 | OI | | | | 0.96 |
| 5.750 | 0.48 | 0.32 | 0.110 | OI | | | | 0.97 |
| 5.833 | 0.48 | 0.33 | 0.111 | OI | | | | 0.98 |
| 5.917 | 0.49 | 0.33 | 0.112 | OI | | | | 0.99 |
| 6.000 | 0.49 | 0.33 | 0.113 | OI | | | | 1.00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.083 | 0.49 | 0.34 | 0.114 | OI | | | | | 1.01 |
| 6.167 | 0.49 | 0.34 | 0.115 | OI | | | | | 1.02 |
| 6.250 | 0.50 | 0.34 | 0.116 | OI | | | | | 1.03 |
| 6.333 | 0.50 | 0.35 | 0.117 | OI | | | | | 1.04 |
| 6.417 | 0.50 | 0.35 | 0.118 | OI | | | | | 1.04 |
| 6.500 | 0.50 | 0.35 | 0.119 | OI | | | | | 1.05 |
| 6.583 | 0.51 | 0.35 | 0.121 | OI | | | | | 1.06 |
| 6.667 | 0.51 | 0.36 | 0.122 | OI | | | | | 1.07 |
| 6.750 | 0.51 | 0.36 | 0.123 | OI | | | | | 1.08 |
| 6.833 | 0.51 | 0.36 | 0.124 | OI | | | | | 1.09 |
| 6.917 | 0.52 | 0.37 | 0.125 | OI | | | | | 1.10 |
| 7.000 | 0.52 | 0.37 | 0.126 | OI | | | | | 1.11 |
| 7.083 | 0.52 | 0.37 | 0.127 | OI | | | | | 1.12 |
| 7.167 | 0.52 | 0.38 | 0.128 | OI | | | | | 1.13 |
| 7.250 | 0.53 | 0.38 | 0.129 | O | | | | | 1.14 |
| 7.333 | 0.53 | 0.38 | 0.130 | O | | | | | 1.15 |
| 7.417 | 0.53 | 0.38 | 0.131 | O | | | | | 1.15 |
| 7.500 | 0.54 | 0.39 | 0.132 | O | | | | | 1.16 |
| 7.583 | 0.54 | 0.39 | 0.133 | O | | | | | 1.17 |
| 7.667 | 0.54 | 0.39 | 0.134 | O | | | | | 1.18 |
| 7.750 | 0.54 | 0.40 | 0.135 | O | | | | | 1.19 |
| 7.833 | 0.55 | 0.40 | 0.136 | O | | | | | 1.20 |
| 7.917 | 0.55 | 0.40 | 0.137 | O | | | | | 1.21 |
| 8.000 | 0.55 | 0.41 | 0.138 | O | | | | | 1.22 |
| 8.083 | 0.56 | 0.41 | 0.139 | O | | | | | 1.23 |
| 8.167 | 0.56 | 0.41 | 0.140 | O | | | | | 1.23 |
| 8.250 | 0.56 | 0.41 | 0.141 | O | | | | | 1.24 |
| 8.333 | 0.57 | 0.42 | 0.142 | O | | | | | 1.25 |
| 8.417 | 0.57 | 0.42 | 0.143 | O | | | | | 1.26 |
| 8.500 | 0.57 | 0.42 | 0.144 | O | | | | | 1.27 |
| 8.583 | 0.58 | 0.43 | 0.145 | O | | | | | 1.28 |
| 8.667 | 0.58 | 0.43 | 0.146 | O | | | | | 1.29 |
| 8.750 | 0.58 | 0.43 | 0.147 | O | | | | | 1.30 |
| 8.833 | 0.59 | 0.44 | 0.148 | O | | | | | 1.31 |
| 8.917 | 0.59 | 0.44 | 0.149 | O | | | | | 1.32 |
| 9.000 | 0.60 | 0.44 | 0.150 | O | | | | | 1.33 |
| 9.083 | 0.60 | 0.45 | 0.151 | O | | | | | 1.34 |
| 9.167 | 0.60 | 0.45 | 0.152 | O | | | | | 1.35 |
| 9.250 | 0.61 | 0.45 | 0.154 | O | | | | | 1.35 |
| 9.333 | 0.61 | 0.45 | 0.155 | O | | | | | 1.36 |
| 9.417 | 0.62 | 0.46 | 0.156 | O | | | | | 1.37 |
| 9.500 | 0.62 | 0.46 | 0.157 | O | | | | | 1.38 |
| 9.583 | 0.62 | 0.46 | 0.158 | O | | | | | 1.39 |
| 9.667 | 0.63 | 0.47 | 0.159 | O | | | | | 1.40 |
| 9.750 | 0.63 | 0.47 | 0.160 | O | | | | | 1.41 |
| 9.833 | 0.64 | 0.47 | 0.161 | O | | | | | 1.42 |
| 9.917 | 0.64 | 0.48 | 0.162 | O | | | | | 1.43 |
| 10.000 | 0.65 | 0.48 | 0.164 | O | | | | | 1.44 |
| 10.083 | 0.65 | 0.48 | 0.165 | O | | | | | 1.45 |
| 10.167 | 0.66 | 0.49 | 0.166 | O | | | | | 1.46 |
| 10.250 | 0.66 | 0.49 | 0.167 | O | | | | | 1.47 |
| 10.333 | 0.67 | 0.49 | 0.168 | O | | | | | 1.48 |
| 10.417 | 0.67 | 0.50 | 0.169 | O | | | | | 1.49 |
| 10.500 | 0.68 | 0.50 | 0.171 | O | | | | | 1.50 |
| 10.583 | 0.69 | 0.51 | 0.172 | O | | | | | 1.51 |
| 10.667 | 0.69 | 0.51 | 0.173 | O | | | | | 1.52 |
| 10.750 | 0.70 | 0.52 | 0.174 | O | | | | | 1.53 |
| 10.833 | 0.70 | 0.53 | 0.176 | O | | | | | 1.54 |
| 10.917 | 0.71 | 0.53 | 0.177 | O | | | | | 1.55 |
| 11.000 | 0.72 | 0.54 | 0.178 | O | | | | | 1.55 |
| 11.083 | 0.72 | 0.54 | 0.179 | O | | | | | 1.56 |
| 11.167 | 0.73 | 0.55 | 0.180 | O | | | | | 1.57 |
| 11.250 | 0.74 | 0.55 | 0.182 | O | | | | | 1.58 |
| 11.333 | 0.74 | 0.56 | 0.183 | O | | | | | 1.59 |
| 11.417 | 0.75 | 0.56 | 0.184 | O | | | | | 1.60 |
| 11.500 | 0.76 | 0.57 | 0.186 | OI | | | | | 1.61 |
| 11.583 | 0.77 | 0.58 | 0.187 | OI | | | | | 1.61 |
| 11.667 | 0.77 | 0.58 | 0.188 | OI | | | | | 1.62 |
| 11.750 | 0.78 | 0.59 | 0.189 | OI | | | | | 1.63 |
| 11.833 | 0.79 | 0.59 | 0.191 | OI | | | | | 1.64 |
| 11.917 | 0.80 | 0.60 | 0.192 | OI | | | | | 1.65 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12.000 | 0.81 | 0.61 | 0.193 | OI | | | | 1.66 |
| 12.083 | 0.82 | 0.61 | 0.195 | OI | | | | 1.67 |
| 12.167 | 0.88 | 0.62 | 0.197 | OI | | | | 1.68 |
| 12.250 | 0.96 | 0.63 | 0.199 | OI | | | | 1.69 |
| 12.333 | 1.01 | 0.64 | 0.201 | OI | | | | 1.71 |
| 12.417 | 1.03 | 0.65 | 0.204 | OI | | | | 1.73 |
| 12.500 | 1.04 | 0.66 | 0.206 | OI | | | | 1.75 |
| 12.583 | 1.06 | 0.68 | 0.209 | OI | | | | 1.76 |
| 12.667 | 1.07 | 0.69 | 0.211 | OI | | | | 1.78 |
| 12.750 | 1.08 | 0.70 | 0.214 | OI | | | | 1.80 |
| 12.833 | 1.09 | 0.71 | 0.217 | OI | | | | 1.82 |
| 12.917 | 1.11 | 0.72 | 0.219 | OI | | | | 1.84 |
| 13.000 | 1.12 | 0.74 | 0.222 | OI | | | | 1.85 |
| 13.083 | 1.13 | 0.75 | 0.225 | O I | | | | 1.87 |
| 13.167 | 1.15 | 0.76 | 0.227 | OI | | | | 1.89 |
| 13.250 | 1.16 | 0.77 | 0.230 | OI | | | | 1.91 |
| 13.333 | 1.18 | 0.78 | 0.233 | OI | | | | 1.93 |
| 13.417 | 1.20 | 0.80 | 0.235 | OI | | | | 1.95 |
| 13.500 | 1.21 | 0.81 | 0.238 | OI | | | | 1.96 |
| 13.583 | 1.23 | 0.82 | 0.241 | OI | | | | 1.98 |
| 13.667 | 1.25 | 0.84 | 0.244 | OI | | | | 2.00 |
| 13.750 | 1.27 | 0.85 | 0.247 | OI | | | | 2.02 |
| 13.833 | 1.29 | 0.86 | 0.250 | OI | | | | 2.04 |
| 13.917 | 1.31 | 0.88 | 0.253 | OI | | | | 2.06 |
| 14.000 | 1.33 | 0.89 | 0.256 | OI | | | | 2.08 |
| 14.083 | 1.36 | 0.90 | 0.259 | OI | | | | 2.10 |
| 14.167 | 1.38 | 0.92 | 0.262 | OI | | | | 2.13 |
| 14.250 | 1.41 | 0.93 | 0.265 | OI | | | | 2.15 |
| 14.333 | 1.44 | 0.95 | 0.269 | OI | | | | 2.17 |
| 14.417 | 1.47 | 0.96 | 0.272 | OI | | | | 2.20 |
| 14.500 | 1.51 | 0.98 | 0.276 | OI | | | | 2.22 |
| 14.583 | 1.54 | 1.00 | 0.279 | O I | | | | 2.24 |
| 14.667 | 1.58 | 1.01 | 0.283 | O I | | | | 2.27 |
| 14.750 | 1.62 | 1.03 | 0.287 | O I | | | | 2.30 |
| 14.833 | 1.67 | 1.05 | 0.291 | O I | | | | 2.33 |
| 14.917 | 1.71 | 1.07 | 0.295 | O I | | | | 2.36 |
| 15.000 | 1.77 | 1.09 | 0.300 | O I | | | | 2.39 |
| 15.083 | 1.83 | 1.11 | 0.305 | O I | | | | 2.42 |
| 15.167 | 1.89 | 1.14 | 0.310 | O I | | | | 2.45 |
| 15.250 | 1.97 | 1.16 | 0.315 | O I | | | | 2.49 |
| 15.333 | 2.05 | 1.19 | 0.321 | O I | | | | 2.53 |
| 15.417 | 2.12 | 1.21 | 0.327 | O I | | | | 2.57 |
| 15.500 | 2.09 | 1.24 | 0.333 | O I | | | | 2.61 |
| 15.583 | 2.00 | 1.27 | 0.339 | O I | | | | 2.65 |
| 15.667 | 2.04 | 1.29 | 0.344 | O I | | | | 2.68 |
| 15.750 | 2.21 | 1.32 | 0.349 | O I | | | | 2.72 |
| 15.833 | 2.48 | 1.35 | 0.356 | O I | | | | 2.77 |
| 15.917 | 2.90 | 1.39 | 0.365 | O I | | | | 2.83 |
| 16.000 | 3.70 | 1.45 | 0.378 | O I | | | | 2.92 |
| 16.083 | 5.78 | 1.60 | 0.401 | O | I | | | 3.05 |
| 16.167 | 10.29 | 2.02 | 0.443 | O | | | I | 3.28 |
| 16.250 | 12.09 | 2.61 | 0.505 | O | | | I | 3.59 |
| 16.333 | 7.59 | 3.07 | 0.553 | O | I | | | 3.84 |
| 16.417 | 4.14 | 3.25 | 0.571 | O I | | | | 3.94 |
| 16.500 | 2.74 | 3.26 | 0.573 | IO | | | | 3.95 |
| 16.583 | 2.47 | 3.22 | 0.568 | I O | | | | 3.92 |
| 16.667 | 2.11 | 3.16 | 0.562 | I O | | | | 3.89 |
| 16.750 | 1.95 | 3.09 | 0.555 | I O | | | | 3.85 |
| 16.833 | 1.82 | 3.01 | 0.547 | I O | | | | 3.81 |
| 16.917 | 1.71 | 2.93 | 0.538 | I O | | | | 3.77 |
| 17.000 | 1.62 | 2.85 | 0.530 | I O | | | | 3.72 |
| 17.083 | 1.54 | 2.77 | 0.521 | I O | | | | 3.68 |
| 17.167 | 1.47 | 2.69 | 0.513 | I O | | | | 3.64 |
| 17.250 | 1.41 | 2.61 | 0.505 | I O | | | | 3.59 |
| 17.333 | 1.35 | 2.53 | 0.496 | I O | | | | 3.55 |
| 17.417 | 1.31 | 2.45 | 0.488 | I O | | | | 3.51 |
| 17.500 | 1.27 | 2.38 | 0.481 | I O | | | | 3.47 |
| 17.583 | 1.23 | 2.30 | 0.473 | I O | | | | 3.43 |
| 17.667 | 1.19 | 2.23 | 0.466 | I O | | | | 3.39 |
| 17.750 | 1.16 | 2.16 | 0.459 | I O | | | | 3.36 |
| 17.833 | 1.13 | 2.10 | 0.452 | I O | | | | 3.32 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 17.917 | 1.10 | 2.04 | 0.445 | \| I  O \| | \| | \| | \| | 3.29 |
| 18.000 | 1.08 | 1.98 | 0.439 | \| I  O \| | \| | \| | \| | 3.25 |
| 18.083 | 1.05 | 1.92 | 0.433 | \| I  O \| | \| | \| | \| | 3.22 |
| 18.167 | 0.98 | 1.86 | 0.427 | \| I O \| | \| | \| | \| | 3.19 |
| 18.250 | 0.89 | 1.80 | 0.421 | \| I O \| | \| | \| | \| | 3.16 |
| 18.333 | 0.83 | 1.74 | 0.415 | \| I O \| | \| | \| | \| | 3.13 |
| 18.417 | 0.80 | 1.68 | 0.409 | \| I O \| | \| | \| | \| | 3.10 |
| 18.500 | 0.78 | 1.62 | 0.403 | \| I O \| | \| | \| | \| | 3.07 |
| 18.583 | 0.76 | 1.57 | 0.397 | \| I O \| | \| | \| | \| | 3.04 |
| 18.667 | 0.75 | 1.51 | 0.392 | \|I  O \| | \| | \| | \| | 3.01 |
| 18.750 | 0.73 | 1.48 | 0.386 | \|I O \| | \| | \| | \| | 2.97 |
| 18.833 | 0.72 | 1.46 | 0.381 | \|I O \| | \| | \| | \| | 2.94 |
| 18.917 | 0.71 | 1.44 | 0.376 | \|I O \| | \| | \| | \| | 2.91 |
| 19.000 | 0.70 | 1.41 | 0.371 | \|I O \| | \| | \| | \| | 2.87 |
| 19.083 | 0.68 | 1.39 | 0.366 | \|I O \| | \| | \| | \| | 2.84 |
| 19.167 | 0.67 | 1.37 | 0.361 | \|I O \| | \| | \| | \| | 2.80 |
| 19.250 | 0.66 | 1.35 | 0.357 | \|I O \| | \| | \| | \| | 2.77 |
| 19.333 | 0.65 | 1.33 | 0.352 | \|I O \| | \| | \| | \| | 2.74 |
| 19.417 | 0.64 | 1.31 | 0.347 | \|I O \| | \| | \| | \| | 2.71 |
| 19.500 | 0.63 | 1.29 | 0.343 | \|I O \| | \| | \| | \| | 2.68 |
| 19.583 | 0.62 | 1.27 | 0.338 | \|I O \| | \| | \| | \| | 2.65 |
| 19.667 | 0.61 | 1.25 | 0.334 | \|I O \| | \| | \| | \| | 2.62 |
| 19.750 | 0.61 | 1.23 | 0.330 | \|I O \| | \| | \| | \| | 2.59 |
| 19.833 | 0.60 | 1.21 | 0.325 | \|I O \| | \| | \| | \| | 2.56 |
| 19.917 | 0.59 | 1.19 | 0.321 | \|I O \| | \| | \| | \| | 2.53 |
| 20.000 | 0.58 | 1.17 | 0.317 | \|I O \| | \| | \| | \| | 2.50 |
| 20.083 | 0.58 | 1.15 | 0.313 | \|I O \| | \| | \| | \| | 2.48 |
| 20.167 | 0.57 | 1.13 | 0.309 | \|IO \| | \| | \| | \| | 2.45 |
| 20.250 | 0.56 | 1.12 | 0.305 | \|IO \| | \| | \| | \| | 2.42 |
| 20.333 | 0.56 | 1.10 | 0.302 | \|IO \| | \| | \| | \| | 2.40 |
| 20.417 | 0.55 | 1.08 | 0.298 | \|IO \| | \| | \| | \| | 2.37 |
| 20.500 | 0.54 | 1.07 | 0.294 | \|IO \| | \| | \| | \| | 2.35 |
| 20.583 | 0.54 | 1.05 | 0.291 | \|IO \| | \| | \| | \| | 2.32 |
| 20.667 | 0.53 | 1.03 | 0.287 | \|IO \| | \| | \| | \| | 2.30 |
| 20.750 | 0.53 | 1.02 | 0.284 | \|IO \| | \| | \| | \| | 2.28 |
| 20.833 | 0.52 | 1.00 | 0.281 | \|IO \| | \| | \| | \| | 2.25 |
| 20.917 | 0.52 | 0.99 | 0.277 | \|IO \| | \| | \| | \| | 2.23 |
| 21.000 | 0.51 | 0.97 | 0.274 | \|IO \| | \| | \| | \| | 2.21 |
| 21.083 | 0.51 | 0.96 | 0.271 | \|IO \| | \| | \| | \| | 2.19 |
| 21.167 | 0.50 | 0.94 | 0.268 | \|IO \| | \| | \| | \| | 2.17 |
| 21.250 | 0.50 | 0.93 | 0.265 | \|IO \| | \| | \| | \| | 2.15 |
| 21.333 | 0.49 | 0.92 | 0.262 | \|IO \| | \| | \| | \| | 2.13 |
| 21.417 | 0.49 | 0.90 | 0.259 | \|IO \| | \| | \| | \| | 2.11 |
| 21.500 | 0.48 | 0.89 | 0.256 | \|IO \| | \| | \| | \| | 2.09 |
| 21.583 | 0.48 | 0.88 | 0.253 | \|IO \| | \| | \| | \| | 2.07 |
| 21.667 | 0.47 | 0.87 | 0.251 | \|IO \| | \| | \| | \| | 2.05 |
| 21.750 | 0.47 | 0.85 | 0.248 | \|IO \| | \| | \| | \| | 2.03 |
| 21.833 | 0.47 | 0.84 | 0.245 | \|IO \| | \| | \| | \| | 2.01 |
| 21.917 | 0.46 | 0.83 | 0.243 | \|IO \| | \| | \| | \| | 2.00 |
| 22.000 | 0.46 | 0.82 | 0.240 | \|IO \| | \| | \| | \| | 1.98 |
| 22.083 | 0.45 | 0.81 | 0.238 | \|IO \| | \| | \| | \| | 1.96 |
| 22.167 | 0.45 | 0.80 | 0.235 | \|IO \| | \| | \| | \| | 1.95 |
| 22.250 | 0.45 | 0.79 | 0.233 | \|IO \| | \| | \| | \| | 1.93 |
| 22.333 | 0.44 | 0.78 | 0.231 | \|IO \| | \| | \| | \| | 1.91 |
| 22.417 | 0.44 | 0.77 | 0.228 | \|IO \| | \| | \| | \| | 1.90 |
| 22.500 | 0.44 | 0.76 | 0.226 | \|O \| | \| | \| | \| | 1.88 |
| 22.583 | 0.43 | 0.75 | 0.224 | \|O \| | \| | \| | \| | 1.87 |
| 22.667 | 0.43 | 0.74 | 0.222 | \|O \| | \| | \| | \| | 1.85 |
| 22.750 | 0.43 | 0.73 | 0.220 | \|O \| | \| | \| | \| | 1.84 |
| 22.833 | 0.42 | 0.72 | 0.218 | \|O \| | \| | \| | \| | 1.83 |
| 22.917 | 0.42 | 0.71 | 0.216 | \|O \| | \| | \| | \| | 1.81 |
| 23.000 | 0.42 | 0.70 | 0.214 | \|O \| | \| | \| | \| | 1.80 |
| 23.083 | 0.42 | 0.69 | 0.212 | \|O \| | \| | \| | \| | 1.79 |
| 23.167 | 0.41 | 0.68 | 0.210 | \|O \| | \| | \| | \| | 1.77 |
| 23.250 | 0.41 | 0.67 | 0.208 | \|O \| | \| | \| | \| | 1.76 |
| 23.333 | 0.41 | 0.67 | 0.206 | \|O \| | \| | \| | \| | 1.75 |
| 23.417 | 0.40 | 0.66 | 0.205 | \|O \| | \| | \| | \| | 1.74 |
| 23.500 | 0.40 | 0.65 | 0.203 | \|O \| | \| | \| | \| | 1.72 |
| 23.583 | 0.40 | 0.64 | 0.201 | \|O \| | \| | \| | \| | 1.71 |
| 23.667 | 0.40 | 0.63 | 0.200 | \|O \| | \| | \| | \| | 1.70 |
| 23.750 | 0.39 | 0.63 | 0.198 | \|O \| | \| | \| | \| | 1.69 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23.833 | 0.39 | 0.62 | 0.196 | \|O | \| | \| | \| | \| | 1.68 |
| 23.917 | 0.39 | 0.61 | 0.195 | \|O | \| | \| | \| | \| | 1.67 |
| 24.000 | 0.39 | 0.61 | 0.193 | \|O | \| | \| | \| | \| | 1.66 |
| 24.083 | 0.37 | 0.60 | 0.192 | IO | \| | \| | \| | \| | 1.65 |
| 24.167 | 0.26 | 0.59 | 0.190 | IO | \| | \| | \| | \| | 1.63 |
| 24.250 | 0.11 | 0.58 | 0.187 | IO | \| | \| | \| | \| | 1.62 |
| 24.333 | 0.04 | 0.56 | 0.184 | IO | \| | \| | \| | \| | 1.59 |
| 24.417 | 0.01 | 0.55 | 0.180 | IO | \| | \| | \| | \| | 1.57 |
| 24.500 | 0.00 | 0.53 | 0.176 | IO | \| | \| | \| | \| | 1.54 |
| 24.583 | 0.00 | 0.51 | 0.173 | IO | \| | \| | \| | \| | 1.52 |
| 24.667 | 0.00 | 0.50 | 0.169 | IO | \| | \| | \| | \| | 1.49 |
| 24.750 | 0.00 | 0.49 | 0.166 | IO | \| | \| | \| | \| | 1.46 |
| 24.833 | 0.00 | 0.48 | 0.163 | IO | \| | \| | \| | \| | 1.43 |
| 24.917 | 0.00 | 0.47 | 0.159 | IO | \| | \| | \| | \| | 1.41 |
| 25.000 | 0.00 | 0.46 | 0.156 | IO | \| | \| | \| | \| | 1.38 |
| 25.083 | 0.00 | 0.45 | 0.153 | IO | \| | \| | \| | \| | 1.35 |
| 25.167 | 0.00 | 0.44 | 0.150 | IO | \| | \| | \| | \| | 1.32 |
| 25.250 | 0.00 | 0.43 | 0.147 | IO | \| | \| | \| | \| | 1.30 |
| 25.333 | 0.00 | 0.42 | 0.144 | IO | \| | \| | \| | \| | 1.27 |
| 25.417 | 0.00 | 0.41 | 0.141 | IO | \| | \| | \| | \| | 1.24 |
| 25.500 | 0.00 | 0.41 | 0.138 | IO | \| | \| | \| | \| | 1.22 |
| 25.583 | 0.00 | 0.40 | 0.135 | IO | \| | \| | \| | \| | 1.20 |
| 25.667 | 0.00 | 0.39 | 0.133 | IO | \| | \| | \| | \| | 1.17 |
| 25.750 | 0.00 | 0.38 | 0.130 | IO | \| | \| | \| | \| | 1.15 |
| 25.833 | 0.00 | 0.37 | 0.127 | O | \| | \| | \| | \| | 1.12 |
| 25.917 | 0.00 | 0.37 | 0.125 | O | \| | \| | \| | \| | 1.10 |
| 26.000 | 0.00 | 0.36 | 0.122 | O | \| | \| | \| | \| | 1.08 |
| 26.083 | 0.00 | 0.35 | 0.120 | O | \| | \| | \| | \| | 1.06 |
| 26.167 | 0.00 | 0.35 | 0.118 | O | \| | \| | \| | \| | 1.04 |
| 26.250 | 0.00 | 0.34 | 0.115 | O | \| | \| | \| | \| | 1.02 |
| 26.333 | 0.00 | 0.33 | 0.113 | O | \| | \| | \| | \| | 1.00 |
| 26.417 | 0.00 | 0.33 | 0.111 | O | \| | \| | \| | \| | 0.98 |
| 26.500 | 0.00 | 0.32 | 0.108 | O | \| | \| | \| | \| | 0.96 |
| 26.583 | 0.00 | 0.31 | 0.106 | O | \| | \| | \| | \| | 0.94 |
| 26.667 | 0.00 | 0.31 | 0.104 | O | \| | \| | \| | \| | 0.92 |
| 26.750 | 0.00 | 0.30 | 0.102 | O | \| | \| | \| | \| | 0.90 |
| 26.833 | 0.00 | 0.29 | 0.100 | O | \| | \| | \| | \| | 0.88 |
| 26.917 | 0.00 | 0.29 | 0.098 | O | \| | \| | \| | \| | 0.86 |
| 27.000 | 0.00 | 0.28 | 0.096 | O | \| | \| | \| | \| | 0.85 |
| 27.083 | 0.00 | 0.28 | 0.094 | O | \| | \| | \| | \| | 0.83 |
| 27.167 | 0.00 | 0.27 | 0.092 | O | \| | \| | \| | \| | 0.81 |
| 27.250 | 0.00 | 0.27 | 0.090 | O | \| | \| | \| | \| | 0.80 |
| 27.333 | 0.00 | 0.26 | 0.089 | O | \| | \| | \| | \| | 0.78 |
| 27.417 | 0.00 | 0.26 | 0.087 | O | \| | \| | \| | \| | 0.77 |
| 27.500 | 0.00 | 0.25 | 0.085 | O | \| | \| | \| | \| | 0.75 |
| 27.583 | 0.00 | 0.25 | 0.083 | O | \| | \| | \| | \| | 0.74 |
| 27.667 | 0.00 | 0.24 | 0.082 | O | \| | \| | \| | \| | 0.72 |
| 27.750 | 0.00 | 0.24 | 0.080 | O | \| | \| | \| | \| | 0.71 |
| 27.833 | 0.00 | 0.23 | 0.078 | O | \| | \| | \| | \| | 0.69 |
| 27.917 | 0.00 | 0.23 | 0.077 | O | \| | \| | \| | \| | 0.68 |
| 28.000 | 0.00 | 0.22 | 0.075 | O | \| | \| | \| | \| | 0.66 |
| 28.083 | 0.00 | 0.22 | 0.074 | O | \| | \| | \| | \| | 0.65 |
| 28.167 | 0.00 | 0.21 | 0.072 | O | \| | \| | \| | \| | 0.64 |
| 28.250 | 0.00 | 0.21 | 0.071 | O | \| | \| | \| | \| | 0.63 |
| 28.333 | 0.00 | 0.20 | 0.069 | O | \| | \| | \| | \| | 0.61 |
| 28.417 | 0.00 | 0.20 | 0.068 | O | \| | \| | \| | \| | 0.60 |
| 28.500 | 0.00 | 0.20 | 0.067 | O | \| | \| | \| | \| | 0.59 |
| 28.583 | 0.00 | 0.19 | 0.065 | O | \| | \| | \| | \| | 0.58 |
| 28.667 | 0.00 | 0.19 | 0.064 | O | \| | \| | \| | \| | 0.56 |
| 28.750 | 0.00 | 0.18 | 0.063 | O | \| | \| | \| | \| | 0.55 |
| 28.833 | 0.00 | 0.18 | 0.061 | O | \| | \| | \| | \| | 0.54 |
| 28.917 | 0.00 | 0.18 | 0.060 | O | \| | \| | \| | \| | 0.53 |
| 29.000 | 0.00 | 0.17 | 0.059 | O | \| | \| | \| | \| | 0.52 |
| 29.083 | 0.00 | 0.17 | 0.058 | O | \| | \| | \| | \| | 0.51 |
| 29.167 | 0.00 | 0.17 | 0.057 | O | \| | \| | \| | \| | 0.50 |
| 29.250 | 0.00 | 0.16 | 0.056 | O | \| | \| | \| | \| | 0.49 |
| 29.333 | 0.00 | 0.16 | 0.054 | O | \| | \| | \| | \| | 0.48 |
| 29.417 | 0.00 | 0.16 | 0.053 | O | \| | \| | \| | \| | 0.47 |
| 29.500 | 0.00 | 0.15 | 0.052 | O | \| | \| | \| | \| | 0.46 |
| 29.583 | 0.00 | 0.15 | 0.051 | O | \| | \| | \| | \| | 0.45 |
| 29.667 | 0.00 | 0.15 | 0.050 | O | \| | \| | \| | \| | 0.44 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 29.750 | 0.00 | 0.14 | 0.049 | O | \| | \| | \| | \| | 0.43 |
| 29.833 | 0.00 | 0.14 | 0.048 | O | \| | \| | \| | \| | 0.43 |
| 29.917 | 0.00 | 0.14 | 0.047 | O | \| | \| | \| | \| | 0.42 |
| 30.000 | 0.00 | 0.14 | 0.046 | O | \| | \| | \| | \| | 0.41 |
| 30.083 | 0.00 | 0.13 | 0.045 | O | \| | \| | \| | \| | 0.40 |
| 30.167 | 0.00 | 0.13 | 0.044 | O | \| | \| | \| | \| | 0.39 |
| 30.250 | 0.00 | 0.13 | 0.044 | O | \| | \| | \| | \| | 0.38 |
| 30.333 | 0.00 | 0.13 | 0.043 | O | \| | \| | \| | \| | 0.38 |
| 30.417 | 0.00 | 0.12 | 0.042 | O | \| | \| | \| | \| | 0.37 |
| 30.500 | 0.00 | 0.12 | 0.041 | O | \| | \| | \| | \| | 0.36 |
| 30.583 | 0.00 | 0.12 | 0.040 | O | \| | \| | \| | \| | 0.35 |
| 30.667 | 0.00 | 0.12 | 0.039 | O | \| | \| | \| | \| | 0.35 |
| 30.750 | 0.00 | 0.11 | 0.039 | O | \| | \| | \| | \| | 0.34 |
| 30.833 | 0.00 | 0.11 | 0.038 | O | \| | \| | \| | \| | 0.33 |
| 30.917 | 0.00 | 0.11 | 0.037 | O | \| | \| | \| | \| | 0.33 |
| 31.000 | 0.00 | 0.11 | 0.036 | O | \| | \| | \| | \| | 0.32 |
| 31.083 | 0.00 | 0.10 | 0.036 | O | \| | \| | \| | \| | 0.31 |
| 31.167 | 0.00 | 0.10 | 0.035 | O | \| | \| | \| | \| | 0.31 |
| 31.250 | 0.00 | 0.10 | 0.034 | O | \| | \| | \| | \| | 0.30 |
| 31.333 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.30 |
| 31.417 | 0.00 | 0.10 | 0.033 | O | \| | \| | \| | \| | 0.29 |
| 31.500 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 31.583 | 0.00 | 0.09 | 0.032 | O | \| | \| | \| | \| | 0.28 |
| 31.667 | 0.00 | 0.09 | 0.031 | O | \| | \| | \| | \| | 0.27 |
| 31.750 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.27 |
| 31.833 | 0.00 | 0.09 | 0.030 | O | \| | \| | \| | \| | 0.26 |
| 31.917 | 0.00 | 0.09 | 0.029 | O | \| | \| | \| | \| | 0.26 |
| 32.000 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 32.083 | 0.00 | 0.08 | 0.028 | O | \| | \| | \| | \| | 0.25 |
| 32.167 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 32.250 | 0.00 | 0.08 | 0.027 | O | \| | \| | \| | \| | 0.24 |
| 32.333 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 32.417 | 0.00 | 0.08 | 0.026 | O | \| | \| | \| | \| | 0.23 |
| 32.500 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 32.583 | 0.00 | 0.07 | 0.025 | O | \| | \| | \| | \| | 0.22 |
| 32.667 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 32.750 | 0.00 | 0.07 | 0.024 | O | \| | \| | \| | \| | 0.21 |
| 32.833 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.21 |
| 32.917 | 0.00 | 0.07 | 0.023 | O | \| | \| | \| | \| | 0.20 |
| 33.000 | 0.00 | 0.07 | 0.022 | O | \| | \| | \| | \| | 0.20 |
| 33.083 | 0.00 | 0.06 | 0.022 | O | \| | \| | \| | \| | 0.19 |
| 33.167 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 33.250 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.19 |
| 33.333 | 0.00 | 0.06 | 0.021 | O | \| | \| | \| | \| | 0.18 |
| 33.417 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.18 |
| 33.500 | 0.00 | 0.06 | 0.020 | O | \| | \| | \| | \| | 0.17 |
| 33.583 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 33.667 | 0.00 | 0.06 | 0.019 | O | \| | \| | \| | \| | 0.17 |
| 33.750 | 0.00 | 0.05 | 0.019 | O | \| | \| | \| | \| | 0.16 |
| 33.833 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 33.917 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.16 |
| 34.000 | 0.00 | 0.05 | 0.018 | O | \| | \| | \| | \| | 0.15 |
| 34.083 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 34.167 | 0.00 | 0.05 | 0.017 | O | \| | \| | \| | \| | 0.15 |
| 34.250 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.15 |
| 34.333 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 34.417 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 34.500 | 0.00 | 0.05 | 0.016 | O | \| | \| | \| | \| | 0.14 |
| 34.583 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 34.667 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 34.750 | 0.00 | 0.04 | 0.015 | O | \| | \| | \| | \| | 0.13 |
| 34.833 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | \| | 0.13 |
| 34.917 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | \| | 0.12 |
| 35.000 | 0.00 | 0.04 | 0.014 | O | \| | \| | \| | \| | 0.12 |
| 35.083 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | \| | 0.12 |
| 35.167 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | \| | 0.12 |
| 35.250 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | \| | 0.11 |
| 35.333 | 0.00 | 0.04 | 0.013 | O | \| | \| | \| | \| | 0.11 |
| 35.417 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | \| | 0.11 |
| 35.500 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | \| | 0.11 |
| 35.583 | 0.00 | 0.04 | 0.012 | O | \| | \| | \| | \| | 0.11 |

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|---|---|---|---|---|---|---|---|---|
| 35.667 | 0.00 | 0.03 | 0.012 | O | \| | \| | \| | 0.10 |
| 35.750 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 35.833 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 35.917 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.000 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.10 |
| 36.083 | 0.00 | 0.03 | 0.011 | O | \| | \| | \| | 0.09 |
| 36.167 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.250 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.333 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.417 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.09 |
| 36.500 | 0.00 | 0.03 | 0.010 | O | \| | \| | \| | 0.08 |
| 36.583 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 36.667 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 36.750 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 36.833 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 36.917 | 0.00 | 0.03 | 0.009 | O | \| | \| | \| | 0.08 |
| 37.000 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.083 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.167 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.250 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.333 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.417 | 0.00 | 0.02 | 0.008 | O | \| | \| | \| | 0.07 |
| 37.500 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.07 |
| 37.583 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 37.667 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 37.750 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 37.833 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 37.917 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.000 | 0.00 | 0.02 | 0.007 | O | \| | \| | \| | 0.06 |
| 38.083 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 38.167 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.06 |
| 38.250 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.333 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.417 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.500 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.583 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.667 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.750 | 0.00 | 0.02 | 0.006 | O | \| | \| | \| | 0.05 |
| 38.833 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 38.917 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.000 | 0.00 | 0.02 | 0.005 | O | \| | \| | \| | 0.05 |
| 39.083 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.167 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.250 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.333 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.417 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.500 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.583 | 0.00 | 0.01 | 0.005 | O | \| | \| | \| | 0.04 |
| 39.667 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 39.750 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 39.833 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 39.917 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.000 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.083 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.04 |
| 40.167 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.250 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.333 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.417 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.500 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.583 | 0.00 | 0.01 | 0.004 | O | \| | \| | \| | 0.03 |
| 40.667 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 40.750 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 40.833 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 40.917 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.000 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.083 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.167 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.250 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.333 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.417 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.03 |
| 41.500 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | 0.02 |

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|---|---|---|---|---|---|---|---|---|---|
| 41.583 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 41.667 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 41.750 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 41.833 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 41.917 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.000 | 0.00 | 0.01 | 0.003 | O | \| | \| | \| | \| | 0.02 |
| 42.083 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.167 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.250 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.667 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.750 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.833 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 42.917 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.000 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.083 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.167 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.250 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.333 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.417 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.500 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.583 | 0.00 | 0.01 | 0.002 | O | \| | \| | \| | \| | 0.02 |
| 43.667 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 43.750 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 43.833 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 43.917 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.000 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.083 | 0.00 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.01 |
| 44.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 44.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 45.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 46.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 47.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.667 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.750 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.833 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 47.917 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.000 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.083 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.01 |
| 48.167 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.250 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.333 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.417 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.500 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.583 | 0.00 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.00 |
| 48.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 48.750 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 48.833 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 48.917 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.333 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.417 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.500 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.583 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.667 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.750 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.833 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 49.917 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.000 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.083 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.167 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 50.250 | 0.00 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |

**********HYDROGRAPH DATA**********

Number of intervals = 603
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 3.264 (CFS)
Total volume = 1.769 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

---

# HYDRAULIC CALCULATION

```
************************************************************************
                HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
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            Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                          Analysis prepared by:



------------------------------------------------------------------------
  TIME/DATE OF STUDY: 14:22 06/19/2023
========================================================================
 Problem Descriptions:
  18" PIPE CAPACITY CALC


************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   1.500
    FLOWDEPTH(FEET) =   1.420
    PIPE SLOPE(FEET/FEET) =  0.0100
    MANNINGS FRICTION FACTOR = 0.013000
    >>>>> NORMAL DEPTH FLOW(CFS) =     11.29
========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      1.42
    FLOW AREA(SQUARE FEET) =      1.73
    FLOW TOP-WIDTH(FEET) =     0.674
    FLOW PRESSURE + MOMENTUM(POUNDS) =          216.90
    FLOW VELOCITY(FEET/SEC.) =           6.525
    FLOW VELOCITY HEAD(FEET) =           0.661
    HYDRAULIC DEPTH(FEET) =      2.57
    FROUDE NUMBER =     0.718
    SPECIFIC ENERGY(FEET) =            2.08
========================================================================
```

```
**************************************************************************
                HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
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            Ver. 23.0  Release Date: 07/01/2016  License ID 1400

                        Analysis prepared by:



--------------------------------------------------------------------------
  TIME/DATE OF STUDY: 15:27 06/05/2023
==========================================================================
 Problem Descriptions:
  PARKWAY DRAIN SIZING CALC
  Q100 (Mitigated): 8.9 CFS

**************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
--------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =    0.00
            Z2(HORIZONTAL/VERTICAL) =    0.00
    BASEWIDTH(FEET) =     4.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.020000
    UNIFORM FLOW(CFS) =       8.3   )
    MANNINGS FRICTION FACTOR = 0.0130
==========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   0.32
    FLOW TOP-WIDTH(FEET) =         4.00
    FLOW AREA(SQUARE FEET) =           1.29
    HYDRAULIC DEPTH(FEET) =     0.32
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     6.90
    UNIFORM FROUDE NUMBER =    2.143
    PRESSURE + MOMENTUM(POUNDS) =          132.02
    AVERAGED VELOCITY HEAD(FEET) =      0.740
    SPECIFIC ENERGY(FEET) =      1.062
==========================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =         4.00
    CRITICAL FLOW AREA(SQUARE FEET) =           2.14
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     0.54
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     4.16
    CRITICAL DEPTH(FEET) =     0.54
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =          107.45
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.268
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      0.804
==========================================================================
```

Q100(Mitigated)

USE 4' W x 0.33' H
PARKWAY DRAIN

# Grate Inlet Capacity (4'x4')

The capacity of grate inlet operating under oriface flow is computed with Equation (4-10). Equation (4-10) is from Handbook of Hydraulics Brater and King Sixth Edition.

$$Q_o = C_o A \sqrt{2gh} \qquad \text{(Eq. 4-10)}$$

- $Q_o$ = orifice capacity of grate (cfs)
- Co = orifice flow coefficient = 0.67
- A = clear opening area (sq. ft.) of the grate (the total area available for flow). A multiplier of about 0.5 is recommended to be applied to the measured area as a safety factor
- g = acceleration due to gravity (32.2 ft/s$^2$)
- h = allowable head on grate (ft.)

Note:
Use 48"x48" CPC TR. ADA Grate BD (Clear Opening Aera, A= 11.52 sf)
Assume 50% reduction in open area for clogging
Q100: 30.8 CFS (From Site Developed Condition)

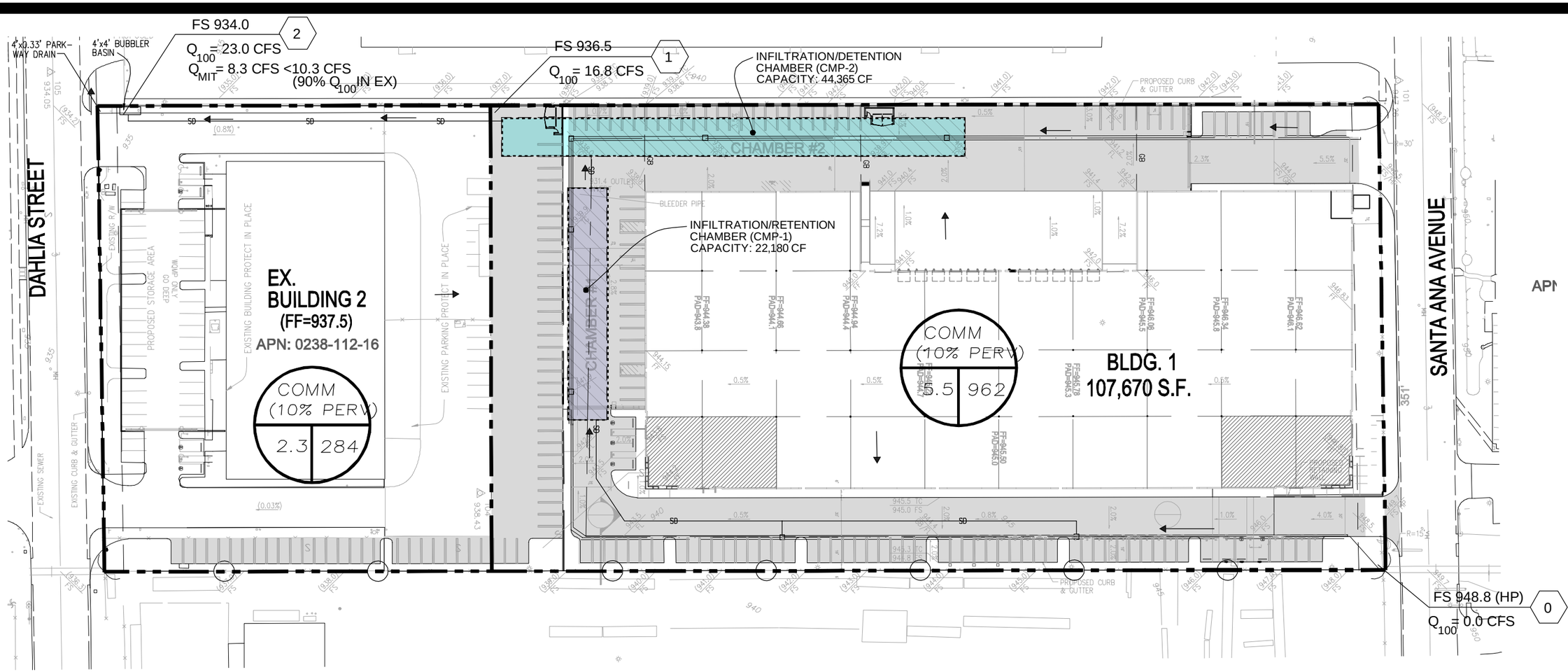
| Inlet # | Water Depth (ft.) | Flow Rate (Q100 cfs) | Grate Capacity (cfs) | Remarks: |
|---|---|---|---|---|
| 1 | 0.36 | 15.4 | 18.6 | 100% Pick up |
| 2 | 0.36 | 15.4 | 18.6 | 100% Pick up |
| | | | | |
| | | | | |

FOR Q100 MITIGATED FLOW OUT (8.3 CFS) ONE 4'x4' BASIN OK FOR UNMITIGATED FLOW PICKUP NEED TWO BASIN's

HEAD: 0.36' ~ 4.3"

# Drainage Exhibit

## Developed Condition




COMM
5.5 960

COMMERCIAL (10% PRV)

ACREAGE (AC.)

TRAVEL LENGTH (FT)

INDICATES DRAINAGE BOUNDARY

INDICATES FLOW DIRECTION

GRAPHIC SCALE
80 40 0 40 80
(in feet)
1 inch = 80 ft

FG 948 (HP)
$Q_{100}$ = 0.0 CFS
0

SURFACE ELEV

NODES

FLOW RATE
100-YR STORMEVENT

## VICINITY MAP




# DRAINAGE EXHIBIT-DEVELOPED CONDITION


Prepared By:

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PREPARED FOR:

THE CONCO COMPANIES

13052 DAHLIA STREET
FONTANA, CA 92337
PH: (925) 685-6799

# Drainage Exhibit

## Existing Condition

FS 934.0
$Q_{100}$ = 11.5 CFS
2

FS 937.0
$Q_{100}$ = 7.4 CFS
1

DAHLIA STREET

SANTA ANA AVENUE

COMM
(10% PERV)
2.3 | 296

GRV
(80% PERV)
5.5 | 752

FS 949.0 (HP)
$Q_{100}$ = 0.0 CFS
0

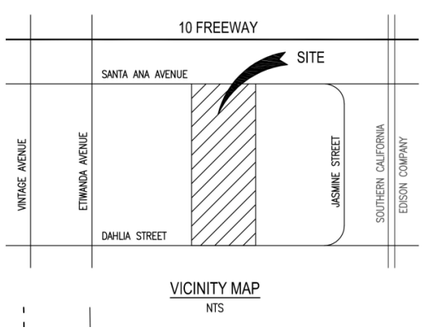
GRV
5.5 | 960
GRAVEL PAVED(80% PRV)
ACREAGE (AC.)
TRAVEL LENGTH (FT)

INDICATES DRAINAGE BOUNDARY

INDICATES FLOW DIRECTION

SURFACE ELEV
NODES
FG 948 (HP)
0
$Q_{100}$ = 0.0 CFS
FLOW RATE
100-YR STORMEVENT

GRAPHIC SCALE
80 40 0 40 80
( IN FEET )
1 SCALE: 1"=80'



VICINITY MAP
NTS

# DRAINAGE EXHIBIT-EXISTING CONDITION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Filename: I:\Conco Companies\DWG\ENTITLEMENT\EXHIBITS\DRAINAGE EXHIBIT.dwg