APPENDIX G1

HYDROLOGY & HYDRAULIC REPORT

HYDROLOGY & HYDRAULIC REPORT FOR EUCLID MIXED USE SPECIFIC PLAN

CITY OF ONTARIO
CALIFORNIA

PREPARED FOR:

WESTLAND GROUP, INC.
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PREPARED BY:

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MARCH 16, 2023
REVISED:

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

03/16/2023

Joseph L. Castaneda RCE 59835 Registered Civil Engineer	Date	Seal

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I. PURPOSE AND SCOPE

The purpose of this study is to evaluate the onsite and offsite watershed area and required storm drain systems as part of the Euclid Mixed Use Specific Plan project. The project site is located within the City of Ontario Master Drainage Plan Area XIV and plans to construct several City of Ontario Master Drainage Plan storm drain facilities.

The scope of the study includes the following:

1. Determination of the 100-year peak flow rates for the onsite project area for the pre-project and post-project conditions.
2. Sizing of the proposed onsite storm drain systems and subsurface systems to ensure flood protection for the site and mitigation for the water quality volume and increased runoff mitigation volume.
3. Assess the existing and proposed MDP facilities adjacent to and downstream of the project site.
4. Preparation of a hydrology report, which consists of hydrological and analytical results and exhibits.

II. PROJECT DESCRIPTION AND MASTER DRAINAGE PLAN OVERVIEW

Euclid Mixed Use Specific Plan (EMUSP) is a proposed industrial development within the City of Ontario. The project site is bounded by Schaefer Avenue to the north, Euclid Avenue to the west, Edison Avenue to the south, and Sultana Avenue to the east, as shown on Figure 1 Vicinity Map. The project site is located within the City of Ontario's Master Drainage Plan (MDP) Area XIV, see Excerpt A. The City of Ontario's Master Drainage Plan Planned Facilities Map has been included as Excerpt B.

The MDP Area XIV is approximately bounded by Riverside Drive to the north, between Bon View Avenue and Grove Avenue to the east, Merrill Avenue to the south, and Euclid Avenue to the west, see Figure 1 Vicinity Map. Runoff flows to the south and is collected in storm drain facilities which ultimately discharge into the City of Chino Line I system located south of the southwestern corner of Area XIV near the intersection of Merrill Avenue and Euclid Avenue.

As part of the PM 20016 Project (Ontario Ranch Business Park) storm drain infrastructure is being constructed along Euclid Avenue, Eucalyptus Avenue, Merrill Avenue, Sultana Avenue, Campus Avenue, and Bon View Avenue. This project was assessed based on the downstream storm drain construction being completed and operational. The existing MDP facilities constructed per PM 20016 are shown on Figure 2. Based on the PM 20016 study, upstream projects are required to mitigate their flows to 80% of pre-project levels.

The EMUSP project proposes the following storm drain infrastructure:

1. Master Drainage Plan Facilities, as shown on Figure 3

   a. EULD-XIV-1 located on Euclid Avenue between Schaefer Avenue and Edison Avenue.
   b. EULD-XIV-3 located on Edison Avenue east of Euclid Avenue
   c. EULD-XIV-4 located on Schaefer Avenue east of Euclid Avenue
2. Onsite Drainage Facilities, as shown on Exhibit C
   a. Catch basins, inlets, and storm drain systems.
   b. Subsurface systems

III. ONSITE HYDROLOGY

The San Bernardino County Hydrology Manual (Reference 1) and the City of Ontario Master Draining Plan Area XIV Hydrology Calculations were used to develop the hydrological parameters for the hydrology analyses. The rational method and unit hydrograph method were used for the analyses and the computations were performed using the computer program developed by Civil Cadd/Civil Design.

The rainfall depths used in the hydrology calculations are as follows:

Table A. Rainfall Values

Storm Event & Duration	Rainfall (inches)
100-Year, 1-Hour	1.2
100-Year, 3-Hour	2.1
100-Year, 6-Hour	3.0
100-Year, 24-Hour	6.0
Slope of Intensity	0.6

The existing soil classification for the on-site area consists of Hydrologic Soil Group "B". An Antecedent Moisture Condition of II was used for the 100-year calculations. The rainfall depths and Antecedent Moisture Condition are based on the City of Ontario MDP Area XIV hydrology calculations.

A land cover type of Commercial/Industrial was used for the onsite areas in the post-project condition. A land cover type of Undeveloped (poor cover) was used for the onsite area in the pre-project condition.

The impervious ratio and runoff index values from the rational method analysis were used for the unit hydrograph analyses. The time of concentration from the rational method analysis was used for calculating the lag time for the unit hydrograph. To compute a time of concentration for the pre-project areas, the post-project time of concentration was adjusted using a ratio between the Manning's N values for the pre-project and post-project conditions.

The rational method analysis analyzed Area A, Area B, and Area C. Area A consist of 7 sub-areas with a total of 34 acres. Area B consist of 5 sub-areas with a total area of 16 acres. Area

C consist of 2 sub-areas with a total area of 8 acres. An additional model was run with all three areas and user entry commands to confluence Area A, Area B, and Area C. The rational method analysis was performed for a 100-year storm event.

The results of the rational method analysis are as follows:

Table B. Rational Method Results		
Area	**Post-Project Results**	
	Peak Flow Rate, ft^3/s	**Time of Concentration, min**
A	89.26	12.89
B	52.78	8.24
C	25.85	9.02
Total	149.69	13.36

The unit hydrograph analysis analyzed the initial areas from rational method Area A, Area B, and Area C. The unit hydrograph analysis was performed for the 100-year storm event for the pre-project and post-project conditions.

The results of the unit hydrograph analysis are as follows:

Table C. Unit Hydrograph Results		
Area	**Pre-Project**	**Post-Project**
	Peak Flow Rate, ft^3/s	**Peak Flow Rate, ft^3/s**
A1	5.32	12.93
A2	8.69	19.41
A3	6.96	16.12
A4	8.14	20.73
A5	3.80	8.54
A6	6.34	14.62
A7	3.28	7.59
B1	6.26	14.63
B2	2.96	6.18
B3	7.20	16.13
B4	4.97	11.38
B5	3.45	7.14
C1	7.17	16.40
C2	4.15	9.78

The results of the rational method analysis will be used to provide pipe sizing for the onsite storm drain systems. The results of the unit hydrograph analysis will be used to calculate the storage volume required to provide increased runoff mitigation.

The post-project onsite rational method calculations have been included in Appendix A. The pre-project onsite unit hydrograph calculations have been included in Appendix B. The post-project onsite unit hydrograph calculations have been included in Appendix C. The onsite rational method hydrology map is included as Exhibit A.

IV. ONSITE HYDRAULICS

A drainage facilities map has been provided for the project site, see Exhibit C. The runoff from the onsite project areas is conveyed via a system of inlets and storm drains to the subsurface systems. The purpose of the subsurface systems is for mitigation of the water quality volume and to provide increased runoff mitigation.

A preliminary storm drain sizing calculation was performed based on the 100-year flow rates per the rational method hydrology analysis. The FlowMaster program was used to calculate the required pipe size such that the percent full is 75% or less to account for hydraulic losses. A slope of 0.5% was used for the analysis. The pipe sizing calculations are included in Appendix E.

The proposed subsurface systems were sized based on the water quality volume and increased runoff mitigation volume. The increased runoff mitigation volume was calculated based on the unit hydrograph results and a flow rate mitigation to 80% of the pre-project flow rate. The required volumes are included in Appendix C. A typical cross-section for a 96” subsurface system and the required system lengths for each area are included in Appendix C.

V. OFFSITE HYDROLOGY

The project is proposing to construct storm drain infrastructure as required by the City of Ontario Master Drainage Plan. The flow rates within the MDP are based on a developed condition. However, an offsite hydrology analyses was performed for the 100 year condition to understand the interim flow rates that will flow towards Schaefer Avenue. Exhibit B was prepared to develop nodes, subareas and flowlines for Area A and Area B which are tributary to Schaefer Avenue. Watershed Areas A is approximately 240 acres and Watershed Area B is approximately 155 acres. The purpose of the hydrology is to determine the interim flow rate that will be required to be intercepted along Schaefer Avenue in the interim condition. The runoff from this area will be allowed to conveyed into the MDP Euld-XIV-4 Storm Drain system that is located along Schaefer Avenue and has a MDP defined flow rate of that ranges from 122 ft^3/s to 235 ft^3/s. The Euld-XIV-1 Storm Drain along Euclid Avenue has been planned to convey 570 ft^3/s. Table D below provides the flow rates for the 100 year condition for Area A and Area B.

Table D. Rational Method Results				
Area	Interim Condition Flow Rates			
	Peak Flow Rate, ft^3/s	Area (acres)	Time of Concentration, min	Intensity, in/hr
A	196.6	153.9	25.23	2.02
B	212.2	236.8	41.61	1.50

In the interim condition, the total flow rate for Area A and Area B will be approximately 360 ft^3/s based upon a confluence assessment. The capacity of the Euld-XIV-1 Storm Drain (570 ft^3/s) and the Euld-XIV-4 Storm Drain (235 ft^3/s to 122 ft^3/s) will allow the interim condition flow rates to be captured. This will provide the necessary flood protection measures to protect the project from flooding.

VI. CONCLUSION

The study evaluated the proposed industrial development to assess the drainage patterns and proposed storm drain systems for the onsite area and offsite area. It has been concluded that:

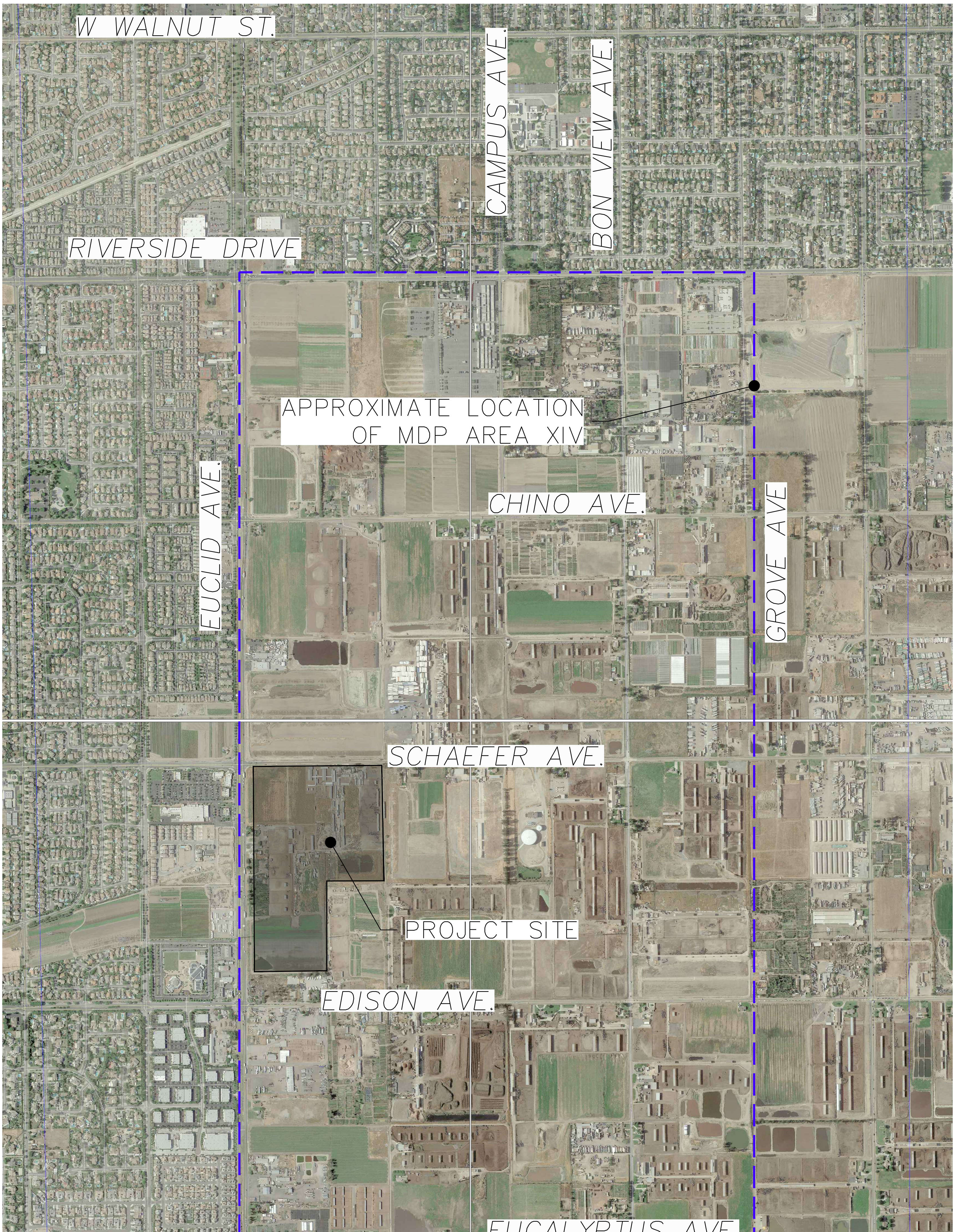
1. The proposed project is located within the City of Ontario Master Drainage Plan Area XIV which provides the regional storm drain system to flood protect the area.
2. Based on the existing downstream MDP systems, the project is required to mitigate onsite runoff to 80% of pre-project levels.
3. The project proposes onsite storm drain systems to sufficiently flood protect the project site and provide mitigation for water quality and increased runoff.
4. The project proposes to construct three MDP systems located to the north, west, and south of the project site. These MDP facilities will provide the necessary flood protection for the project.

VII. REFERENCES

1. San Bernardino Flood Control Hydrology Manual, August 1986.
2. City of Ontario Master Plan of Drainage, Revised June 2017

FIGURES

FIGURE 1: VICINITY MAP



SCALE 1"=1200'

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits\FIGURE-1-VICINITY-MAP.dwg
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VICINITY MAP

FIGURE 1

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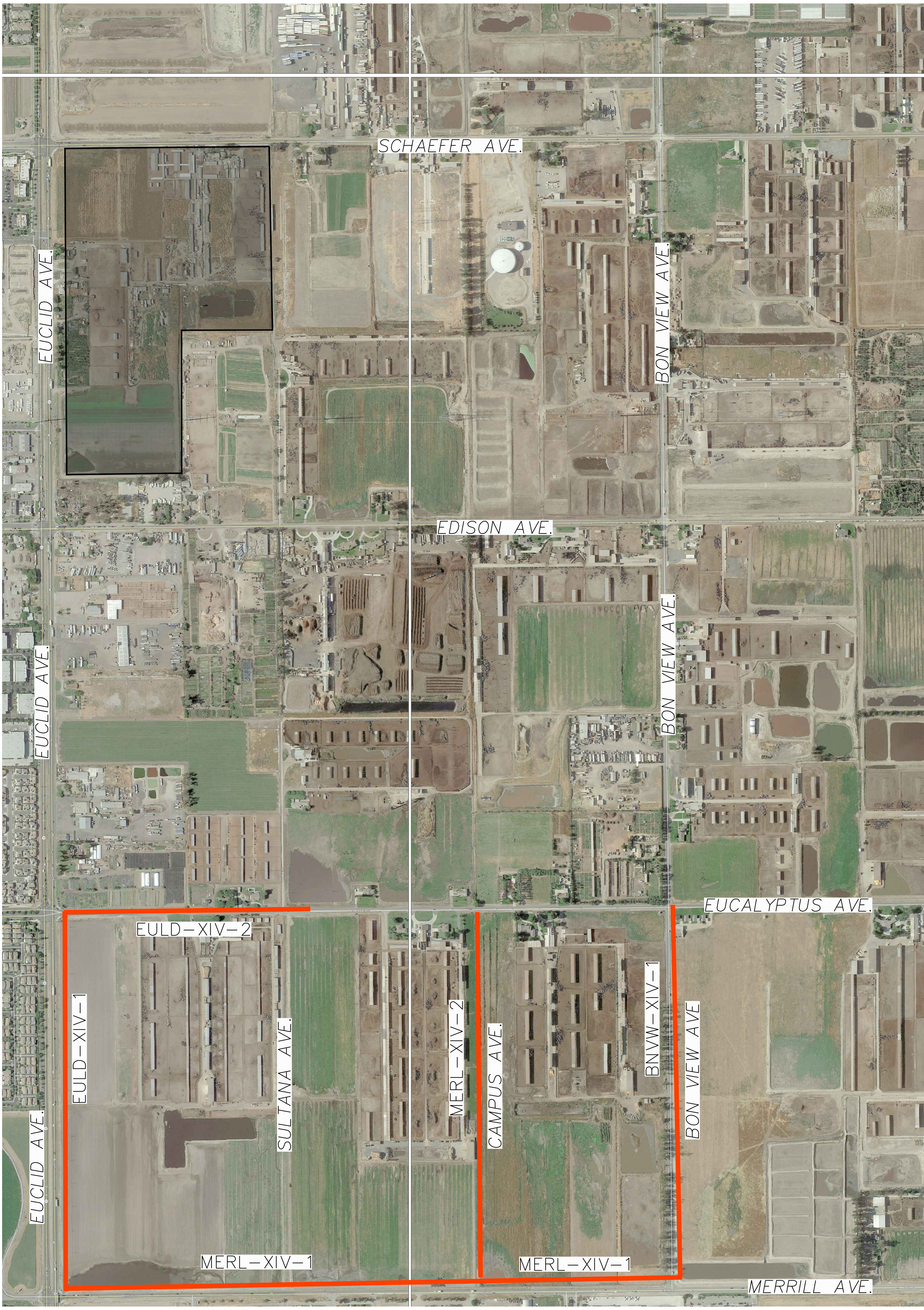
FIGURE 2: EXISTING MDP DRAINAGE FACILITIES MAP

EXISTING MDP DRAINAGE FACILITIES MAP



SCALE 1"=700'

LEGEND:

EXISTING MDP SYSTEMS PER PM 20016

PROJECT SITE

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FIGURE 2

EXISTING MDP DRAINAGE FACILITIES MAP

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits\FIGURE-2-EXISTING-MDP.dwg
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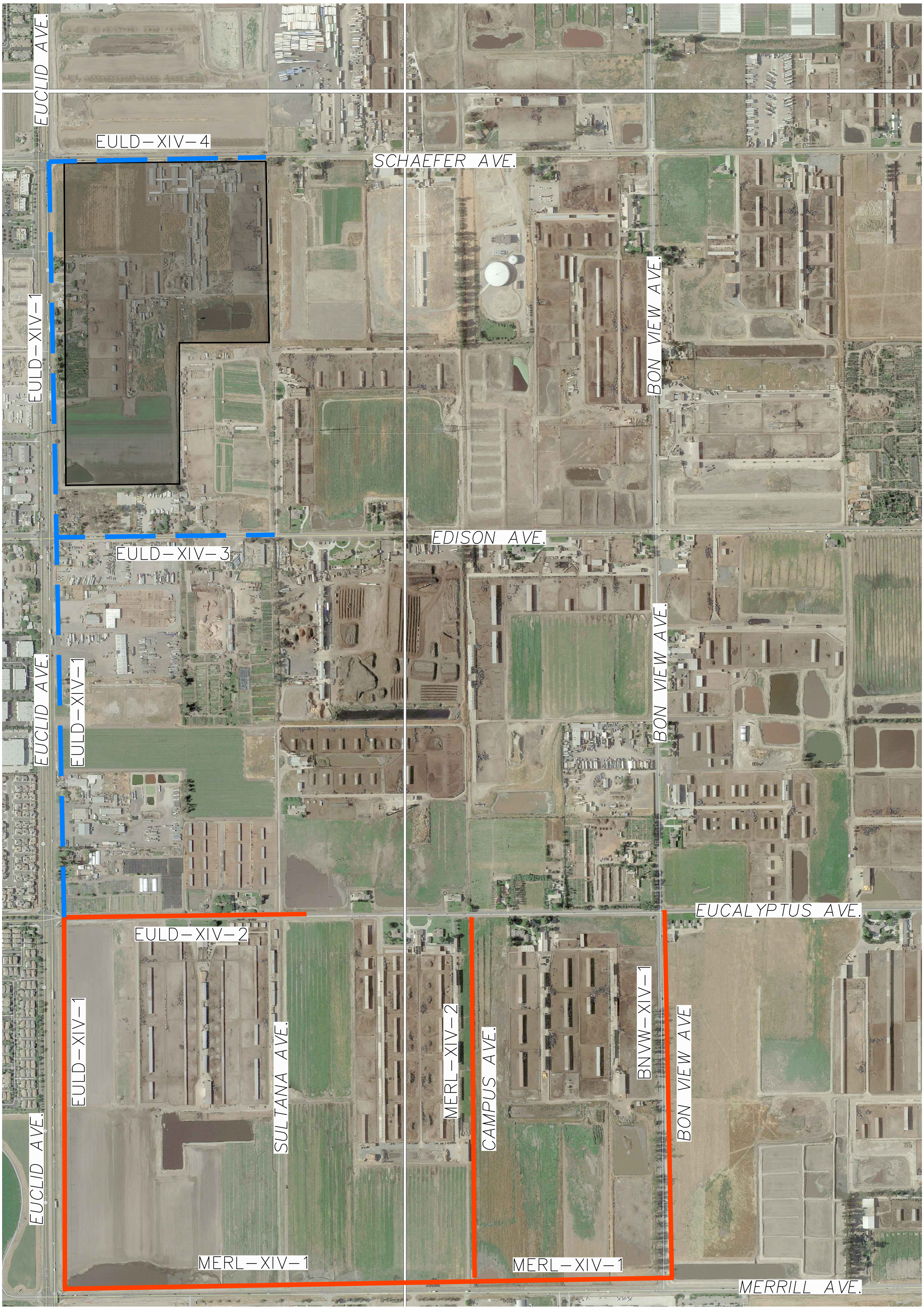
FIGURE 3: PROPOSED MDP FACILITIES MAP

PROPOSED MDP DRAINAGE FACILITIES MAP



LEGEND:

EXISTING MDP SYSTEMS PER PM 20016

PROPOSED MDP SYSTEMS

PROJECT SITE

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FIGURE 3

PROPOSED MDP DRAINAGE FACILITIES MAP

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APPENDICES

APPENDIX A: POST-PROJECT ONSITE RATIONAL METHOD CALCULATIONS

APPENDIX A.1: RATIONAL METHOD ANALYSIS, AREAS "A"

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              San Bernardino County Rational Hydrology Program

                  (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 03/09/23
------------------------------------------------------------------------
EUCLID AVE
ONSITE RATIONAL METHOD
100 YEAR STORM
AREA A
------------------------------------------------------------------------


Program License Serial Number 6279

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

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   786.000(Ft.)
Top (of initial area) elevation =   721.000(Ft.)
Bottom (of initial area) elevation =   716.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00636  s(%)=       0.64
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.032 min.
Rainfall intensity =      3.147(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.879
Subarea runoff =     12.752(CFS)
Total initial stream area =        4.610(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   716.000(Ft.)
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Downstream point/station elevation =   715.000(Ft.)
Pipe length  =   150.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.752(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.752(CFS)
Normal flow depth in pipe =   16.95(In.)
Flow top width inside pipe =   16.58(In.)
Critical Depth =   15.96(In.)
Pipe flow velocity =      6.13(Ft/s)
Travel time through pipe =    0.41 min.
Time of concentration (TC) =    12.44 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      105.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.610(Ac.)
Runoff from this stream =     12.752(CFS)
Time of concentration =   12.44 min.
Rainfall intensity =     3.085(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   656.000(Ft.)
Top (of initial area) elevation =   725.000(Ft.)
Bottom (of initial area) elevation =   716.000(Ft.)
Difference in elevation =     9.000(Ft.)
Slope =    0.01372  s(%)=       1.37
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.598 min.
Rainfall intensity =      3.604(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =     20.685(CFS)
Total initial stream area =        6.510(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   716.000(Ft.)
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Downstream point/station elevation =   715.000(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.685(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    20.685(CFS)
Normal flow depth in pipe =   14.51(In.)
Flow top width inside pipe =   14.24(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.55(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =     9.63 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.510(Ac.)
Runoff from this stream =     20.685(CFS)
Time of concentration =    9.63 min.
Rainfall intensity =     3.597(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     12.75     4.610     12.44    0.073      3.085
2     20.69     6.510      9.63    0.073      3.597
Qmax(1) =
         1.000 *    1.000 *    12.752) +
         0.855 *    1.000 *    20.685) + =      30.428
Qmax(2) =
         1.170 *    0.774 *    12.752) +
         1.000 *    1.000 *    20.685) + =      32.235

Total of 2 main streams to confluence:
Flow rates before confluence point:
      13.752      21.685
Maximum flow rates at confluence using above data:
       30.428       32.235
Area of streams before confluence:
        4.610        6.510
Effective area values after confluence:
       11.120       10.078


Results of confluence:
Total flow rate =     32.235(CFS)
Time of concentration =     9.628 min.
Effective stream area after confluence  =     10.078(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =      11.12(Ac.)
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      115.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   715.000(Ft.)
Downstream point/station elevation =   709.000(Ft.)
Pipe length  =   750.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.235(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    32.235(CFS)
Normal flow depth in pipe =   21.80(In.)
Flow top width inside pipe =   26.74(In.)
Critical Depth =   23.18(In.)
Pipe flow velocity =      8.43(Ft/s)
Travel time through pipe =    1.48 min.
Time of concentration (TC) =    11.11 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      115.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     10.078(Ac.)
Runoff from this stream =     32.235(CFS)
Time of concentration =   11.11 min.
Rainfall intensity =     3.301(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      109.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   456.000(Ft.)
Top (of initial area) elevation =   718.000(Ft.)
Bottom (of initial area) elevation =   711.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01535  s(%)=       1.54
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.114 min.
Rainfall intensity =      3.986(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff =     16.832(CFS)
Total initial stream area =        4.780(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)
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Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      4.780(Ac.)
Runoff from this stream =     16.832(CFS)
Time of concentration =    8.11 min.
Rainfall intensity =     3.986(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      108.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   855.000(Ft.)
Top (of initial area) elevation =   715.000(Ft.)
Bottom (of initial area) elevation =   712.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00351  s(%)=       0.35
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.016 min.
Rainfall intensity =      2.871(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =     19.718(CFS)
Total initial stream area =        7.830(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   712.000(Ft.)
Downstream point/station elevation =   711.000(Ft.)
Pipe length  =   220.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.718(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    19.718(CFS)
Normal flow depth in pipe =   20.91(In.)
Flow top width inside pipe =   22.57(In.)
Critical Depth =   18.65(In.)
Pipe flow velocity =      5.97(Ft/s)
Travel time through pipe =    0.61 min.
Time of concentration (TC) =    14.63 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
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```
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      7.830(Ac.)
Runoff from this stream =     19.718(CFS)
Time of concentration =   14.63 min.
Rainfall intensity =     2.799(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     16.83     4.780      8.11    0.073      3.986
2     19.72     7.830     14.63    0.073      2.799
Qmax(1) =
         1.000 *    1.000 *    16.832) +
         1.436 *    0.555 *    19.718) + =      32.533
Qmax(2) =
         0.697 *    1.000 *    16.832) +
         1.000 *    1.000 *    19.718) + =      31.441

Total of 2 streams to confluence:
Flow rates before confluence point:
      16.832      19.718
Maximum flow rates at confluence using above data:
       32.533       31.441
Area of streams before confluence:
        4.780        7.830
Effective area values after confluence:
        9.123       12.610
Results of confluence:
Total flow rate =     32.533(CFS)
Time of concentration =     8.114 min.
Effective stream area after confluence =      9.123(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total (this main stream) =      12.61(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      115.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =   711.000(Ft.)
Downstream point/station elevation =   709.000(Ft.)
Pipe length  =    50.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.533(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    32.533(CFS)
Normal flow depth in pipe =   15.07(In.)
Flow top width inside pipe =   23.20(In.)
Critical Depth =   22.74(In.)
Pipe flow velocity =     15.67(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     8.17 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      115.000
**** CONFLUENCE OF MAIN STREAMS ****
```

```
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      9.123(Ac.)
Runoff from this stream =     32.533(CFS)
Time of concentration =    8.17 min.
Rainfall intensity =     3.970(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
```

```
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   477.000(Ft.)
Top (of initial area) elevation =   725.000(Ft.)
Bottom (of initial area) elevation =   720.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.01048  s(%)=       1.05
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.916 min.
Rainfall intensity =      3.767(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =      9.008(CFS)
Total initial stream area =        2.710(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
```

```
Upstream point/station elevation =   720.000(Ft.)
Downstream point/station elevation =   716.000(Ft.)
Pipe length  =   150.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.008(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.008(CFS)
Normal flow depth in pipe =   10.66(In.)
Flow top width inside pipe =   13.60(In.)
Critical Depth =   13.86(In.)
Pipe flow velocity =      9.66(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =     9.18 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      114.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =      2.710(Ac.)
Runoff from this stream =      9.008(CFS)
Time of concentration =    9.18 min.
Rainfall intensity =     3.703(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      112.000 to Point/Station      113.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   700.000(Ft.)
Top (of initial area) elevation =   723.000(Ft.)
Bottom (of initial area) elevation =   717.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00857  s(%)=      0.86
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.822 min.
Rainfall intensity =      3.353(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =     15.410(CFS)
Total initial stream area =        5.220(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   717.000(Ft.)
Downstream point/station elevation =   716.000(Ft.)
Pipe length  =    75.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.410(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    15.410(CFS)
Normal flow depth in pipe =   14.77(In.)
Flow top width inside pipe =   19.19(In.)
Critical Depth =   17.42(In.)
Pipe flow velocity =      8.53(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    10.97 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
```

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 2
Stream flow area =   5.220(Ac.)
Runoff from this stream =   15.410(CFS)
Time of concentration =   10.97 min.
Rainfall intensity =   3.326(In/Hr)
Area averaged loss rate (Fm) =   0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	9.01	2.710	9.18	0.073	3.703
2	15.41	5.220	10.97	0.073	3.326

```
Qmax(1) =
         1.000 *    1.000 *     9.008) +
         1.116 *    0.837 *    15.410) + =      23.389
Qmax(2) =
         0.896 *    1.000 *     9.008) +
         1.000 *    1.000 *    15.410) + =      23.484
```

Total of 2 streams to confluence:
Flow rates before confluence point:
9.008   15.410
Maximum flow rates at confluence using above data:
23.389   23.484
Area of streams before confluence:
2.710   5.220
Effective area values after confluence:
7.077   7.930
Results of confluence:
Total flow rate =   23.484(CFS)
Time of concentration =   10.968 min.
Effective stream area after confluence =   7.930(Ac.)
Study area average Pervious fraction(Ap) = 0.100
Study area average soil loss rate(Fm) =   0.073(In/Hr)
Study area total (this main stream) =   7.93(Ac.)

++
Process from Point/Station   114.000 to Point/Station   115.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation =   716.000(Ft.)
Downstream point/station elevation =   709.000(Ft.)
Pipe length =   285.00(Ft.)   Manning's N = 0.013
No. of pipes = 1 Required pipe flow =   23.484(CFS)
Nearest computed pipe diameter =   21.00(In.)
Calculated individual pipe flow =   23.484(CFS)
Normal flow depth in pipe =   16.27(In.)
Flow top width inside pipe =   17.55(In.)
Critical Depth =   19.93(In.)
Pipe flow velocity =   11.74(Ft/s)
Travel time through pipe =   0.40 min.
Time of concentration (TC) =   11.37 min.

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** CONFLUENCE OF MAIN STREAMS ****
```

```
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      7.930(Ac.)
Runoff from this stream =     23.484(CFS)
Time of concentration =   11.37 min.
Rainfall intensity =     3.255(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     32.23    10.078     11.11    0.073      3.301
2     32.53     9.123      8.17    0.073      3.970
3     23.48     7.930     11.37    0.073      3.255
Qmax(1) =
         1.000 *    1.000 *    32.235) +
         0.828 *    1.000 *    32.533) +
         1.014 *    0.977 *    23.484) + =      82.451
Qmax(2) =
         1.207 *    0.735 *    32.235) +
         1.000 *    1.000 *    32.533) +
         1.225 *    0.718 *    23.484) + =      81.799
Qmax(3) =
         0.986 *    1.000 *    32.235) +
         0.816 *    1.000 *    32.533) +
         1.000 *    1.000 *    23.484) + =      81.822

Total of 3 main streams to confluence:
Flow rates before confluence point:
      33.235      33.533      24.484
Maximum flow rates at confluence using above data:
       82.451       81.799       81.822
Area of streams before confluence:
       10.078        9.123        7.930
Effective area values after confluence:
       26.948       22.225       27.131


Results of confluence:
Total flow rate =     82.451(CFS)
Time of concentration =    11.111 min.
Effective stream area after confluence  =     26.948(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =      27.13(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      118.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
```

```
Upstream point/station elevation =    709.000(Ft.)
Downstream point/station elevation =    708.000(Ft.)
```

```
Pipe length  =   150.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    82.451(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    82.451(CFS)
Normal flow depth in pipe =   31.45(In.)
Flow top width inside pipe =   41.28(In.)
Critical Depth =   33.57(In.)
Pipe flow velocity =     10.01(Ft/s)
Travel time through pipe =    0.25 min.
Time of concentration (TC) =    11.36 min.


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Process from Point/Station      115.000 to Point/Station      118.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     26.948(Ac.)
Runoff from this stream =     82.451(CFS)
Time of concentration =   11.36 min.
Rainfall intensity =     3.257(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      116.000 to Point/Station      117.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   452.000(Ft.)
Top (of initial area) elevation =   717.000(Ft.)
Bottom (of initial area) elevation =   710.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01549  s(%)=       1.55
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.071 min.
Rainfall intensity =      3.999(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff =      7.949(CFS)
Total initial stream area =        2.250(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      118.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   710.000(Ft.)
Downstream point/station elevation =   709.000(Ft.)
```

```
Pipe length  =   220.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.949(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.949(CFS)
Normal flow depth in pipe =   13.50(In.)
Flow top width inside pipe =   20.12(In.)
Critical Depth =   12.55(In.)
Pipe flow velocity =      4.87(Ft/s)
Travel time through pipe =    0.75 min.
Time of concentration (TC) =     8.82 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      118.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.250(Ac.)
Runoff from this stream =      7.949(CFS)
Time of concentration =    8.82 min.
Rainfall intensity =     3.790(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     82.45    26.948     11.36    0.073      3.257
2      7.95     2.250      8.82    0.073      3.790
Qmax(1) =
         1.000 *    1.000 *    82.451) +
         0.857 *    1.000 *     7.949) + =      89.260
Qmax(2) =
         1.167 *    0.777 *    82.451) +
         1.000 *    1.000 *     7.949) + =      82.716

Total of 2 main streams to confluence:
Flow rates before confluence point:
      83.451       8.949
Maximum flow rates at confluence using above data:
       89.260       82.716
Area of streams before confluence:
       26.948        2.250
Effective area values after confluence:
       29.198       23.182


Results of confluence:
Total flow rate =     89.260(CFS)
Time of concentration =    11.361 min.
Effective stream area after confluence  =     29.198(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =      29.20(Ac.)


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```
Process from Point/Station      118.000 to Point/Station      119.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   709.000(Ft.)
Downstream point/station elevation =   700.000(Ft.)
Pipe length  =   250.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    89.260(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    89.260(CFS)
Normal flow depth in pipe =   24.23(In.)
Flow top width inside pipe =   29.15(In.)
Critical depth could not be calculated.
Pipe flow velocity =     19.09(Ft/s)
Travel time through pipe =    0.22 min.
Time of concentration (TC) =    11.58 min.
End of computations, Total Study Area =           33.91 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  56.0
```

APPENDIX A.2: RATIONAL METHOD ANALYSIS, AREAS “B”

```
              San Bernardino County Rational Hydrology Program

                  (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 03/09/23
------------------------------------------------------------------------
EUCLID AVE
ONSITE RATIONAL METHOD
100 YEAR STORM
AREA B
------------------------------------------------------------------------


Program License Serial Number 6279

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

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   357.000(Ft.)
Top (of initial area) elevation =   714.000(Ft.)
Bottom (of initial area) elevation =   710.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.01120  s(%)=       1.12
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.835 min.
Rainfall intensity =      4.070(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff =     15.324(CFS)
Total initial stream area =        4.260(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      205.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   710.000(Ft.)
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Downstream point/station elevation =   700.000(Ft.)
Pipe length  =   934.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.324(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    15.324(CFS)
Normal flow depth in pipe =   16.10(In.)
Flow top width inside pipe =   17.76(In.)
Critical Depth =   17.37(In.)
Pipe flow velocity =      7.75(Ft/s)
Travel time through pipe =    2.01 min.
Time of concentration (TC) =     9.84 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      205.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.260(Ac.)
Runoff from this stream =     15.324(CFS)
Time of concentration =    9.84 min.
Rainfall intensity =     3.549(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   225.000(Ft.)
Top (of initial area) elevation =   705.000(Ft.)
Bottom (of initial area) elevation =   700.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.02222  s(%)=       2.22
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.681 min.
Rainfall intensity =      4.937(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.887
Subarea runoff =      7.047(CFS)
Total initial stream area =        1.610(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      205.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   700.000(Ft.)
```

```
Downstream point/station elevation =   699.000(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.047(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     7.047(CFS)
Normal flow depth in pipe =    9.73(In.)
Flow top width inside pipe =    9.40(In.)
Critical depth could not be calculated.
Pipe flow velocity =     10.34(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     5.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      205.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.610(Ac.)
Runoff from this stream =      7.047(CFS)
Time of concentration =    5.72 min.
Rainfall intensity =     4.916(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     15.32     4.260      9.84    0.073      3.549
2      7.05     1.610      5.72    0.073      4.916
Qmax(1) =
         1.000 *    1.000 *    15.324) +
         0.718 *    1.000 *     7.047) + =      20.383
Qmax(2) =
         1.393 *    0.581 *    15.324) +
         1.000 *    1.000 *     7.047) + =      19.453

Total of 2 main streams to confluence:
Flow rates before confluence point:
      16.324       8.047
Maximum flow rates at confluence using above data:
       20.383       19.453
Area of streams before confluence:
        4.260        1.610
Effective area values after confluence:
        5.870        4.085


Results of confluence:
Total flow rate =     20.383(CFS)
Time of concentration =     9.845 min.
Effective stream area after confluence  =      5.870(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =       5.87(Ac.)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      213.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   699.000(Ft.)
Downstream point/station elevation =   698.000(Ft.)
Pipe length  =   275.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.383(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    20.383(CFS)
Normal flow depth in pipe =   20.74(In.)
Flow top width inside pipe =   27.71(In.)
Critical Depth =   18.40(In.)
Pipe flow velocity =      5.63(Ft/s)
Travel time through pipe =    0.81 min.
Time of concentration (TC) =    10.66 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      213.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      5.870(Ac.)
Runoff from this stream =     20.383(CFS)
Time of concentration =   10.66 min.
Rainfall intensity =     3.384(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      207.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   550.000(Ft.)
Top (of initial area) elevation =   706.000(Ft.)
Bottom (of initial area) elevation =   700.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01091  s(%)=       1.09
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.364 min.
Rainfall intensity =      3.658(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =     17.097(CFS)
Total initial stream area =        5.300(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      207.000 to Point/Station      210.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   700.000(Ft.)
Downstream point/station elevation =   699.000(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.097(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    17.097(CFS)
Normal flow depth in pipe =   12.33(In.)
Flow top width inside pipe =   16.72(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.25(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =     9.40 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      207.000 to Point/Station      210.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      5.300(Ac.)
Runoff from this stream =     17.097(CFS)
Time of concentration =    9.40 min.
Rainfall intensity =     3.650(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      208.000 to Point/Station      209.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   310.000(Ft.)
Top (of initial area) elevation =   704.000(Ft.)
Bottom (of initial area) elevation =   700.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.01290  s(%)=       1.29
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.199 min.
Rainfall intensity =      4.283(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =     11.971(CFS)
Total initial stream area =        3.160(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      209.000 to Point/Station      210.000
```

```
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   700.000(Ft.)
Downstream point/station elevation =   699.000(Ft.)
Pipe length  =    75.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.971(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.971(CFS)
Normal flow depth in pipe =   14.53(In.)
Flow top width inside pipe =   14.20(In.)
Critical Depth =   15.76(In.)
Pipe flow velocity =      7.82(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =     7.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      209.000 to Point/Station      210.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      3.160(Ac.)
Runoff from this stream =     11.971(CFS)
Time of concentration =    7.36 min.
Rainfall intensity =     4.227(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     17.10     5.300      9.40    0.073      3.650
2     11.97     3.160      7.36    0.073      4.227
Qmax(1) =
         1.000 *    1.000 *    17.097) +
         0.861 *    1.000 *    11.971) + =      27.406
Qmax(2) =
         1.161 *    0.783 *    17.097) +
         1.000 *    1.000 *    11.971) + =      27.519

Total of 2 streams to confluence:
Flow rates before confluence point:
      17.097      11.971
Maximum flow rates at confluence using above data:
       27.406       27.519
Area of streams before confluence:
        5.300        3.160
Effective area values after confluence:
        8.460        7.311
Results of confluence:
Total flow rate =     27.519(CFS)
Time of concentration =     7.359 min.
Effective stream area after confluence =      7.311(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total (this main stream) =       8.46(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      213.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   699.000(Ft.)
Downstream point/station elevation =   698.000(Ft.)
Pipe length  =   206.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.519(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    27.519(CFS)
Normal flow depth in pipe =   23.63(In.)
Flow top width inside pipe =   24.54(In.)
Critical Depth =   21.45(In.)
Pipe flow velocity =      6.63(Ft/s)
Travel time through pipe =    0.52 min.
Time of concentration (TC) =     7.88 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      213.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.311(Ac.)
Runoff from this stream =     27.519(CFS)
Time of concentration =    7.88 min.
Rainfall intensity =     4.058(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      211.000 to Point/Station      212.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   183.000(Ft.)
Top (of initial area) elevation =   703.000(Ft.)
Bottom (of initial area) elevation =   700.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.01639  s(%)=       1.64
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.558 min.
Rainfall intensity =      5.002(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.887
Subarea runoff =      8.250(CFS)
Total initial stream area =        1.860(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)
```

++
Process from Point/Station 212.000 to Point/Station 213.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 700.000(Ft.)
Downstream point/station elevation = 698.000(Ft.)
Pipe length = 240.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 8.250(CFS)
Nearest computed pipe diameter = 18.00(In.)
Calculated individual pipe flow = 8.250(CFS)
Normal flow depth in pipe = 12.87(In.)
Flow top width inside pipe = 16.25(In.)
Critical Depth = 13.35(In.)
Pipe flow velocity = 6.10(Ft/s)
Travel time through pipe = 0.66 min.
Time of concentration (TC) = 6.21 min.

++
Process from Point/Station 212.000 to Point/Station 213.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area = 1.860(Ac.)
Runoff from this stream = 8.250(CFS)
Time of concentration = 6.21 min.
Rainfall intensity = 4.678(In/Hr)
Area averaged loss rate (Fm) = 0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	20.38	5.870	10.66	0.073	3.384
2	27.52	7.311	7.88	0.073	4.058
3	8.25	1.860	6.21	0.073	4.678

Qmax(1) =
1.000 * 1.000 * 20.383) +
0.831 * 1.000 * 27.519) +
0.719 * 1.000 * 8.250) + = 49.181
Qmax(2) =
1.203 * 0.739 * 20.383) +
1.000 * 1.000 * 27.519) +
0.865 * 1.000 * 8.250) + = 52.783
Qmax(3) =
1.391 * 0.583 * 20.383) +
1.156 * 0.789 * 27.519) +
1.000 * 1.000 * 8.250) + = 49.865

Total of 3 main streams to confluence:
Flow rates before confluence point:
21.383 28.519 9.250
Maximum flow rates at confluence using above data:
49.181 52.783 49.865
Area of streams before confluence:
5.870 7.311 1.860
Effective area values after confluence:

```
       15.041       13.509       11.049


Results of confluence:
Total flow rate =     52.783(CFS)
Time of concentration =     7.877 min.
Effective stream area after confluence  =     13.509(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =      15.04(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      213.000 to Point/Station      214.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   698.000(Ft.)
Downstream point/station elevation =   695.000(Ft.)
Pipe length  =   245.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.783(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    52.783(CFS)
Normal flow depth in pipe =   24.52(In.)
Flow top width inside pipe =   28.84(In.)
Critical Depth =   28.54(In.)
Pipe flow velocity =     11.15(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =     8.24 min.
End of computations, Total Study Area =          16.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  56.0
```

APPENDIX A.3: RATIONAL METHOD ANALYSIS, AREAS "C"

```
            San Bernardino County Rational Hydrology Program

                (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 03/09/23
------------------------------------------------------------------------
EUCLID AVE
ONSITE RATIONAL METHOD
100 YEAR STORM
AREA C
------------------------------------------------------------------------


Program License Serial Number 6279

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

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      304.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   459.000(Ft.)
Top (of initial area) elevation =   697.000(Ft.)
Bottom (of initial area) elevation =   691.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01307  s(%)=       1.31
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.401 min.
Rainfall intensity =      3.904(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff =     17.167(CFS)
Total initial stream area =        4.980(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      304.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
```

```
In Main Stream number: 1
Stream flow area =      4.980(Ac.)
Runoff from this stream =     17.167(CFS)
Time of concentration =    8.40 min.
Rainfall intensity =     3.904(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   751.000(Ft.)
Top (of initial area) elevation =   700.000(Ft.)
Bottom (of initial area) elevation =   694.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00799  s(%)=       0.80
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.288 min.
Rainfall intensity =      3.270(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =      9.982(CFS)
Total initial stream area =        3.470(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   694.000(Ft.)
Downstream point/station elevation =   691.000(Ft.)
Pipe length  =   303.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.982(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.982(CFS)
Normal flow depth in pipe =   14.06(In.)
Flow top width inside pipe =   14.88(In.)
Critical Depth =   14.61(In.)
Pipe flow velocity =      6.73(Ft/s)
Travel time through pipe =    0.75 min.
Time of concentration (TC) =    12.04 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
```

```
In Main Stream number: 2
Stream flow area =      3.470(Ac.)
Runoff from this stream =      9.982(CFS)
Time of concentration =   12.04 min.
Rainfall intensity =     3.146(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     17.17     4.980      8.40    0.073      3.904
2      9.98     3.470     12.04    0.073      3.146
Qmax(1) =
         1.000 *    1.000 *    17.167) +
         1.247 *    0.698 *     9.982) + =      25.851
Qmax(2) =
         0.802 *    1.000 *    17.167) +
         1.000 *    1.000 *     9.982) + =      23.752

Total of 2 main streams to confluence:
Flow rates before confluence point:
      18.167      10.982
Maximum flow rates at confluence using above data:
       25.851       23.752
Area of streams before confluence:
        4.980        3.470
Effective area values after confluence:
        7.402        8.450


Results of confluence:
Total flow rate =     25.851(CFS)
Time of concentration =     8.401 min.
Effective stream area after confluence  =      7.402(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =       8.45(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   691.000(Ft.)
Downstream point/station elevation =   687.000(Ft.)
Pipe length  =   343.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    25.851(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    25.851(CFS)
Normal flow depth in pipe =   17.81(In.)
Flow top width inside pipe =   25.59(In.)
Critical Depth =   21.30(In.)
Pipe flow velocity =      9.28(Ft/s)
Travel time through pipe =    0.62 min.
Time of concentration (TC) =     9.02 min.
End of computations, Total Study Area =            8.45 (Ac.)
The following figures may
```

be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number = 56.0

APPENDIX A.4: RATIONAL METHOD ANALYSIS, AREAS "TOTAL"

```
            San Bernardino County Rational Hydrology Program

                 (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 03/09/23
------------------------------------------------------------------------
EUCLID AVE
ONSITE RATIONAL METHOD
100 YEAR STORM
TOTAL AREA
------------------------------------------------------------------------


Program License Serial Number 6279

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

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      119.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Rainfall intensity =      3.220(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  11.58 min.  Rain intensity =       3.22(In/Hr)
Total area this stream =        33.91(Ac.)
Total Study Area (Main Stream No. 1) =      33.91(Ac.)
Total runoff =     89.26(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      214.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   700.000(Ft.)
Downstream point/station elevation =   695.000(Ft.)
Pipe length  =   781.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    89.260(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    89.260(CFS)
Normal flow depth in pipe =   34.08(In.)
Flow top width inside pipe =   38.58(In.)
Critical Depth =   34.88(In.)
```

Pipe flow velocity =   9.94(Ft/s)
Travel time through pipe =   1.31 min.
Time of concentration (TC) =   12.89 min.

++
Process from Point/Station   119.000 to Point/Station   214.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =   33.910(Ac.)
Runoff from this stream =   89.260(CFS)
Time of concentration =   12.89 min.
Rainfall intensity =   3.020(In/Hr)
Area averaged loss rate (Fm) =   0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2

++
Process from Point/Station   214.000 to Point/Station   214.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000   Max loss rate(Fm)=   0.073(In/Hr)
Rainfall intensity =   3.949(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =   8.24 min. Rain intensity =   3.95(In/Hr)
Total area this stream =   16.19(Ac.)
Total Study Area (Main Stream No. 2) =   50.10(Ac.)
Total runoff =   52.78(CFS)

++
Process from Point/Station   214.000 to Point/Station   214.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =   16.190(Ac.)
Runoff from this stream =   52.780(CFS)
Time of concentration =   8.24 min.
Rainfall intensity =   3.949(In/Hr)
Area averaged loss rate (Fm) =   0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	89.26	33.910	12.89	0.073	3.020
2	52.78	16.190	8.24	0.073	3.949

Qmax(1) =

```
         1.000 *    1.000 *    89.260) +
         0.760 *    1.000 *    52.780) + =     129.379
Qmax(2) =
         1.316 *    0.639 *    89.260) +
         1.000 *    1.000 *    52.780) + =     127.852

Total of 2 main streams to confluence:
Flow rates before confluence point:
      90.260      53.780
Maximum flow rates at confluence using above data:
      129.379      127.852
Area of streams before confluence:
       33.910       16.190
Effective area values after confluence:
       50.100       37.868


Results of confluence:
Total flow rate =    129.379(CFS)
Time of concentration =    12.889 min.
Effective stream area after confluence  =     50.100(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
Study area total =      50.10(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      214.000 to Point/Station      305.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   695.000(Ft.)
Downstream point/station elevation =   687.000(Ft.)
Pipe length  =   450.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   129.379(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =   129.379(CFS)
Normal flow depth in pipe =   33.14(In.)
Flow top width inside pipe =   34.27(In.)
Critical Depth =   39.67(In.)
Pipe flow velocity =     15.88(Ft/s)
Travel time through pipe =    0.47 min.
Time of concentration (TC) =    13.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      214.000 to Point/Station      305.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     50.100(Ac.)
Runoff from this stream =    129.379(CFS)
Time of concentration =   13.36 min.
Rainfall intensity =     2.955(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      305.000 to Point/Station      305.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Rainfall intensity =      3.741(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =   9.02 min.  Rain intensity =       3.74(In/Hr)
Total area this stream =         8.45(Ac.)
Total Study Area (Main Stream No. 2) =       58.55(Ac.)
Total runoff =     25.85(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      305.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      8.450(Ac.)
Runoff from this stream =     25.850(CFS)
Time of concentration =    9.02 min.
Rainfall intensity =     3.741(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1    129.38    50.100     13.36    0.073      2.955
2     25.85     8.450      9.02    0.073      3.741
Qmax(1) =
         1.000 *    1.000 *   129.379) +
         0.786 *    1.000 *    25.850) + =     149.691
Qmax(2) =
         1.273 *    0.675 *   129.379) +
         1.000 *    1.000 *    25.850) + =     137.003

Total of 2 main streams to confluence:
Flow rates before confluence point:
     130.379      26.850
Maximum flow rates at confluence using above data:
      149.691      137.003
Area of streams before confluence:
       50.100        8.450
Effective area values after confluence:
       58.550       42.271


Results of confluence:
Total flow rate =    149.691(CFS)
Time of concentration =    13.361 min.
Effective stream area after confluence  =     58.550(Ac.)
```

Study area average Pervious fraction(Ap) = 0.100
Study area average soil loss rate(Fm) = 0.073(In/Hr)
Study area total = 58.55(Ac.)
End of computations, Total Study Area = 58.55 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number = 56.0

APPENDIX B: PRE-PROJECT ONSITE UNIT HYDROGRAPH CALCULATIONS

APPENDIX B.1: PRE-PROJECT UNIT HYDROGRAPH PARAMETERS TABLE

254.24 EUCLID MIXED USE SPECIFIC PLAN

Pre-Project Unit Hydrograph Input Parameters

Method

Use ratio between existing n and proposed n to alter the Tc and use for the lag time computaiton

(post Tc) * (0.035/0.013) = (pre Tc)

LAG TIME RATIO
2.692

Lag time = 0.8 * time of concentration

Use open space poor cover for existing condition land use

AP = 1

Soil A	62
Soil B	76
Soil C	84
Soil D	88

Area	Acres	Proposed Condition lag time (min)	Proposed lag time (hr)	Existing Condition lag time (hr)	Soil Type B Area %	Existing Conditon Curve Number
A1	4.61	12.03	0.201	**0.540**	100%	**76.0**
A2	6.51	9.60	0.160	**0.431**	100%	**76.0**
A3	4.78	8.11	0.135	**0.364**	100%	**76.0**
A4	7.83	14.02	0.234	**0.629**	100%	**76.0**
A5	2.71	8.92	0.149	**0.400**	100%	**76.0**
A6	5.22	10.82	0.180	**0.486**	100%	**76.0**
A7	2.25	8.07	0.135	**0.362**	100%	**76.0**
B1	4.26	7.84	0.131	**0.352**	100%	**76.0**
B2	1.61	5.68	0.095	**0.255**	100%	**76.0**
B3	5.30	9.36	0.156	**0.420**	100%	**76.0**
B4	3.16	7.20	0.120	**0.323**	100%	**76.0**
B5	1.86	5.56	0.093	**0.249**	100%	**76.0**
C1	4.98	8.40	0.140	**0.377**	100%	**76.0**
C2	3.47	11.29	0.188	**0.507**	100%	**76.0**

APPENDIX B.2: UNIT HYDROGRAPH ANALYSIS, AREA "A"

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

Study date 03/13/23

++

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA A1
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.61	1	1.20
Rainfall data for year 100		
4.61	6	3.00
Rainfall data for year 100		
4.61	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	4.61	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
4.61	1.000	76.0	76.0	3.16	0.563

Area-averaged catchment yield fraction, Y = 0.563
Area-averaged low loss fraction, Yb = 0.437
User entry of time of concentration = 0.540 (hours)
+++
Watershed area = 4.61(Ac.)
Catchment Lag time = 0.432 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 19.2901
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 4.61(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.200(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(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 = 55.75 (CFS))	
1	1.704	0.950
2	6.551	2.703
3	14.962	4.689
4	26.851	6.628
5	40.500	7.610
6	53.146	7.050
7	61.923	4.894
8	68.000	3.388
9	72.316	2.406
10	75.521	1.787
11	78.269	1.532
12	80.599	1.299
13	82.612	1.123
14	84.417	1.006

15	86.029	0.899
16	87.405	0.767
17	88.597	0.665
18	89.755	0.645
19	90.799	0.582
20	91.651	0.475
21	92.492	0.469
22	93.172	0.379
23	93.789	0.344
24	94.397	0.339
25	94.978	0.324
26	95.556	0.322
27	96.046	0.273
28	96.471	0.237
29	96.886	0.231
30	97.243	0.199
31	97.590	0.194
32	97.907	0.176
33	98.177	0.151
34	98.444	0.149
35	98.655	0.118
36	98.848	0.108
37	99.041	0.108
38	99.234	0.108
39	99.427	0.108
40	99.620	0.108
41	99.812	0.108
42	100.000	0.105

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9671	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1154	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3900	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341

29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190

88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147

147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124

206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109

265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064

31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080

90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124

149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155

208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067

267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      5.32(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5      0.0000      0.01  Q         |         |         |         |
  0+10      0.0002      0.02  Q         |         |         |         |
  0+15      0.0005      0.05  Q         |         |         |         |
  0+20      0.0011      0.09  Q         |         |         |         |
  0+25      0.0020      0.13  Q         |         |         |         |
  0+30      0.0033      0.17  Q         |         |         |         |
  0+35      0.0047      0.20  Q         |         |         |         |
  0+40      0.0062      0.22  Q         |         |         |         |
  0+45      0.0078      0.24  Q         |         |         |         |
  0+50      0.0096      0.25  VQ        |         |         |         |
  0+55      0.0114      0.26  VQ        |         |         |         |
  1+ 0      0.0132      0.27  VQ        |         |         |         |
  1+ 5      0.0151      0.28  VQ        |         |         |         |
  1+10      0.0170      0.28  VQ        |         |         |         |
  1+15      0.0190      0.29  VQ        |         |         |         |
  1+20      0.0211      0.29  VQ        |         |         |         |
  1+25      0.0231      0.30  VQ        |         |         |         |
  1+30      0.0252      0.30  VQ        |         |         |         |
  1+35      0.0273      0.31  VQ        |         |         |         |
  1+40      0.0294      0.31  VQ        |         |         |         |
  1+45      0.0316      0.31  VQ        |         |         |         |
  1+50      0.0338      0.32  VQ        |         |         |         |
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1+55	0.0360	0.32	Q				
2+ 0	0.0382	0.32	Q				
2+ 5	0.0405	0.33	Q				
2+10	0.0427	0.33	Q				
2+15	0.0450	0.33	Q				
2+20	0.0473	0.33	Q				
2+25	0.0496	0.34	Q				
2+30	0.0520	0.34	Q				
2+35	0.0543	0.34	Q				
2+40	0.0567	0.34	Q				
2+45	0.0591	0.34	Q				
2+50	0.0614	0.35	Q				
2+55	0.0638	0.35	Q				
3+ 0	0.0662	0.35	Q				
3+ 5	0.0687	0.35	QV				
3+10	0.0711	0.35	QV				
3+15	0.0735	0.35	QV				
3+20	0.0760	0.36	QV				
3+25	0.0785	0.36	QV				
3+30	0.0809	0.36	QV				
3+35	0.0834	0.36	QV				
3+40	0.0859	0.36	QV				
3+45	0.0884	0.36	QV				
3+50	0.0909	0.36	QV				
3+55	0.0935	0.37	QV				
4+ 0	0.0960	0.37	QV				
4+ 5	0.0985	0.37	QV				
4+10	0.1011	0.37	QV				
4+15	0.1036	0.37	Q V				
4+20	0.1062	0.37	Q V				
4+25	0.1088	0.37	Q V				
4+30	0.1114	0.37	Q V				
4+35	0.1139	0.38	Q V				
4+40	0.1165	0.38	Q V				
4+45	0.1191	0.38	Q V				
4+50	0.1218	0.38	Q V				
4+55	0.1244	0.38	Q V				
5+ 0	0.1270	0.38	Q V				
5+ 5	0.1297	0.38	Q V				
5+10	0.1323	0.39	Q V				
5+15	0.1350	0.39	Q V				
5+20	0.1377	0.39	Q V				
5+25	0.1403	0.39	Q V				
5+30	0.1430	0.39	Q V				
5+35	0.1457	0.39	Q V				
5+40	0.1485	0.39	Q V				
5+45	0.1512	0.40	Q V				
5+50	0.1539	0.40	Q V				
5+55	0.1567	0.40	Q V				
6+ 0	0.1594	0.40	Q V				
6+ 5	0.1622	0.40	Q V				
6+10	0.1650	0.40	Q V				
6+15	0.1677	0.40	Q V				
6+20	0.1705	0.41	Q V				
6+25	0.1734	0.41	Q V				
6+30	0.1762	0.41	Q V				
6+35	0.1790	0.41	Q V				
6+40	0.1819	0.41	Q V				
6+45	0.1847	0.41	Q V				

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 6+50       0.1876      0.42   |Q   V    |         |         |         |
 6+55       0.1905      0.42   |Q   V    |         |         |         |
 7+ 0       0.1934      0.42   |Q   V    |         |         |         |
 7+ 5       0.1963      0.42   |Q   V    |         |         |         |
 7+10       0.1992      0.42   |Q   V    |         |         |         |
 7+15       0.2021      0.43   |Q   V    |         |         |         |
 7+20       0.2051      0.43   |Q   V    |         |         |         |
 7+25       0.2080      0.43   |Q    V   |         |         |         |
 7+30       0.2110      0.43   |Q    V   |         |         |         |
 7+35       0.2140      0.43   |Q    V   |         |         |         |
 7+40       0.2170      0.44   |Q    V   |         |         |         |
 7+45       0.2200      0.44   |Q    V   |         |         |         |
 7+50       0.2230      0.44   |Q    V   |         |         |         |
 7+55       0.2261      0.44   |Q    V   |         |         |         |
 8+ 0       0.2291      0.44   |Q    V   |         |         |         |
 8+ 5       0.2322      0.45   |Q    V   |         |         |         |
 8+10       0.2353      0.45   |Q    V   |         |         |         |
 8+15       0.2384      0.45   |Q    V   |         |         |         |
 8+20       0.2415      0.45   |Q     V  |         |         |         |
 8+25       0.2446      0.45   |Q     V  |         |         |         |
 8+30       0.2478      0.46   |Q     V  |         |         |         |
 8+35       0.2510      0.46   |Q     V  |         |         |         |
 8+40       0.2541      0.46   |Q     V  |         |         |         |
 8+45       0.2573      0.46   |Q     V  |         |         |         |
 8+50       0.2606      0.47   |Q     V  |         |         |         |
 8+55       0.2638      0.47   |Q     V  |         |         |         |
 9+ 0       0.2670      0.47   |Q     V  |         |         |         |
 9+ 5       0.2703      0.47   |Q     V  |         |         |         |
 9+10       0.2736      0.48   |Q     V  |         |         |         |
 9+15       0.2769      0.48   |Q      V |         |         |         |
 9+20       0.2802      0.48   |Q      V |         |         |         |
 9+25       0.2836      0.49   |Q      V |         |         |         |
 9+30       0.2869      0.49   |Q      V |         |         |         |
 9+35       0.2903      0.49   |Q      V |         |         |         |
 9+40       0.2937      0.49   |Q      V |         |         |         |
 9+45       0.2971      0.50   |Q      V |         |         |         |
 9+50       0.3006      0.50   |Q      V |         |         |         |
 9+55       0.3040      0.50   | Q     V |         |         |         |
10+ 0       0.3075      0.51   | Q     V |         |         |         |
10+ 5       0.3110      0.51   | Q      V|         |         |         |
10+10       0.3146      0.51   | Q      V|         |         |         |
10+15       0.3181      0.52   | Q      V|         |         |         |
10+20       0.3217      0.52   | Q      V|         |         |         |
10+25       0.3253      0.52   | Q      V|         |         |         |
10+30       0.3289      0.53   | Q      V|         |         |         |
10+35       0.3326      0.53   | Q      V|         |         |         |
10+40       0.3363      0.53   | Q      V|         |         |         |
10+45       0.3400      0.54   | Q      V|         |         |         |
10+50       0.3437      0.54   | Q       V         |         |         |
10+55       0.3474      0.55   | Q       V         |         |         |
11+ 0       0.3512      0.55   | Q       V         |         |         |
11+ 5       0.3550      0.55   | Q       V         |         |         |
11+10       0.3589      0.56   | Q       V         |         |         |
11+15       0.3627      0.56   | Q       V         |         |         |
11+20       0.3666      0.57   | Q       V         |         |         |
11+25       0.3706      0.57   | Q       V         |         |         |
11+30       0.3745      0.58   | Q       V         |         |         |
11+35       0.3785      0.58   | Q       |V        |         |         |
11+40       0.3826      0.58   | Q       |V        |         |         |
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11+45	0.3866	0.59	Q V
11+50	0.3907	0.59	Q V
11+55	0.3949	0.60	Q V
12+ 0	0.3990	0.61	Q V
12+ 5	0.4032	0.61	Q V
12+10	0.4075	0.62	Q V
12+15	0.4118	0.62	Q V
12+20	0.4161	0.63	Q V
12+25	0.4206	0.64	Q V
12+30	0.4250	0.65	Q V
12+35	0.4296	0.66	Q V
12+40	0.4341	0.66	Q V
12+45	0.4388	0.67	Q V
12+50	0.4435	0.68	Q V
12+55	0.4482	0.69	Q V
13+ 0	0.4530	0.70	Q V
13+ 5	0.4578	0.70	Q V
13+10	0.4627	0.71	Q V
13+15	0.4677	0.72	Q V
13+20	0.4728	0.73	Q V
13+25	0.4779	0.74	Q V
13+30	0.4830	0.75	Q V
13+35	0.4883	0.76	Q V
13+40	0.4936	0.77	Q V
13+45	0.4990	0.78	Q V
13+50	0.5044	0.79	Q V
13+55	0.5100	0.81	Q V
14+ 0	0.5156	0.82	Q V
14+ 5	0.5214	0.83	Q V
14+10	0.5272	0.85	Q V
14+15	0.5331	0.86	Q V
14+20	0.5391	0.88	Q V
14+25	0.5453	0.89	Q V
14+30	0.5516	0.91	Q V
14+35	0.5580	0.93	Q V
14+40	0.5645	0.95	Q V
14+45	0.5712	0.97	Q V
14+50	0.5780	0.99	Q V
14+55	0.5850	1.02	Q V
15+ 0	0.5922	1.04	Q V
15+ 5	0.5996	1.07	Q V
15+10	0.6073	1.11	Q V
15+15	0.6151	1.14	Q V
15+20	0.6232	1.18	Q V
15+25	0.6316	1.22	Q V
15+30	0.6402	1.25	Q V
15+35	0.6490	1.28	Q V
15+40	0.6580	1.30	Q V
15+45	0.6672	1.33	Q V
15+50	0.6768	1.39	Q V
15+55	0.6871	1.50	Q V
16+ 0	0.6989	1.71	Q V
16+ 5	0.7150	2.34	Q V
16+10	0.7376	3.28	Q V
16+15	0.7668	4.25	Q V
16+20	0.8016	5.05	Q V
16+25	0.8383	5.32	Q V
16+30	0.8720	4.90	Q V
16+35	0.8988	3.90	Q V

```
16+40       0.9206      3.16  |         | Q       |     V   |         |
16+45       0.9390      2.66  |         Q         |      V  |         |
16+50       0.9550      2.33  |        Q|         |      V  |         |
16+55       0.9698      2.14  |       Q |         |       V |         |
17+ 0       0.9834      1.98  |      Q  |         |       V |         |
17+ 5       0.9961      1.84  |      Q  |         |        V|         |
17+10       1.0079      1.72  |     Q   |         |        V|         |
17+15       1.0191      1.62  |     Q   |         |        V|         |
17+20       1.0295      1.52  |     Q   |         |         V         |
17+25       1.0394      1.43  |    Q    |         |         V         |
17+30       1.0489      1.38  |    Q    |         |         V         |
17+35       1.0579      1.31  |    Q    |         |         V         |
17+40       1.0664      1.23  |   Q     |         |         |V        |
17+45       1.0745      1.19  |   Q     |         |         |V        |
17+50       1.0823      1.12  |   Q     |         |         |V        |
17+55       1.0897      1.08  |   Q     |         |         |V        |
18+ 0       1.0969      1.05  |   Q     |         |         |V        |
18+ 5       1.1040      1.02  |   Q     |         |         | V       |
18+10       1.1108      0.99  |  Q      |         |         | V       |
18+15       1.1173      0.95  |  Q      |         |         | V       |
18+20       1.1236      0.91  |  Q      |         |         | V       |
18+25       1.1296      0.88  |  Q      |         |         | V       |
18+30       1.1355      0.85  |  Q      |         |         |  V      |
18+35       1.1412      0.83  |  Q      |         |         |  V      |
18+40       1.1467      0.80  |  Q      |         |         |  V      |
18+45       1.1520      0.77  |  Q      |         |         |  V      |
18+50       1.1572      0.75  |  Q      |         |         |  V      |
18+55       1.1621      0.73  | Q       |         |         |  V      |
19+ 0       1.1670      0.71  | Q       |         |         |   V     |
19+ 5       1.1718      0.69  | Q       |         |         |   V     |
19+10       1.1765      0.68  | Q       |         |         |   V     |
19+15       1.1811      0.67  | Q       |         |         |   V     |
19+20       1.1856      0.66  | Q       |         |         |   V     |
19+25       1.1900      0.64  | Q       |         |         |   V     |
19+30       1.1943      0.62  | Q       |         |         |   V     |
19+35       1.1982      0.57  | Q       |         |         |   V     |
19+40       1.2021      0.56  | Q       |         |         |    V    |
19+45       1.2059      0.55  | Q       |         |         |    V    |
19+50       1.2096      0.54  | Q       |         |         |    V    |
19+55       1.2132      0.53  | Q       |         |         |    V    |
20+ 0       1.2169      0.52  | Q       |         |         |    V    |
20+ 5       1.2204      0.52  | Q       |         |         |    V    |
20+10       1.2239      0.51  | Q       |         |         |    V    |
20+15       1.2274      0.50  | Q       |         |         |    V    |
20+20       1.2308      0.50  |Q        |         |         |    V    |
20+25       1.2342      0.49  |Q        |         |         |    V    |
20+30       1.2375      0.48  |Q        |         |         |     V   |
20+35       1.2408      0.48  |Q        |         |         |     V   |
20+40       1.2440      0.47  |Q        |         |         |     V   |
20+45       1.2473      0.47  |Q        |         |         |     V   |
20+50       1.2504      0.46  |Q        |         |         |     V   |
20+55       1.2536      0.46  |Q        |         |         |     V   |
21+ 0       1.2567      0.45  |Q        |         |         |     V   |
21+ 5       1.2598      0.45  |Q        |         |         |     V   |
21+10       1.2629      0.44  |Q        |         |         |     V   |
21+15       1.2659      0.44  |Q        |         |         |     V   |
21+20       1.2689      0.43  |Q        |         |         |      V  |
21+25       1.2718      0.43  |Q        |         |         |      V  |
21+30       1.2748      0.43  |Q        |         |         |      V  |
```

21+35	1.2777	0.42	Q	V
21+40	1.2806	0.42	Q	V
21+45	1.2834	0.42	Q	V
21+50	1.2863	0.41	Q	V
21+55	1.2891	0.41	Q	V
22+ 0	1.2919	0.41	Q	V
22+ 5	1.2947	0.40	Q	V
22+10	1.2974	0.40	Q	V
22+15	1.3001	0.40	Q	V
22+20	1.3028	0.39	Q	V
22+25	1.3055	0.39	Q	V
22+30	1.3082	0.39	Q	V
22+35	1.3108	0.38	Q	V
22+40	1.3135	0.38	Q	V
22+45	1.3161	0.38	Q	V
22+50	1.3187	0.38	Q	V
22+55	1.3212	0.37	Q	V
23+ 0	1.3238	0.37	Q	V
23+ 5	1.3263	0.37	Q	V
23+10	1.3288	0.37	Q	V
23+15	1.3313	0.36	Q	V
23+20	1.3338	0.36	Q	V
23+25	1.3363	0.36	Q	V
23+30	1.3388	0.36	Q	V
23+35	1.3412	0.35	Q	V
23+40	1.3436	0.35	Q	V
23+45	1.3460	0.35	Q	V
23+50	1.3484	0.35	Q	V
23+55	1.3508	0.35	Q	V
24+ 0	1.3532	0.34	Q	V
24+ 5	1.3555	0.34	Q	V
24+10	1.3577	0.32	Q	V
24+15	1.3597	0.29	Q	V
24+20	1.3614	0.25	Q	V
24+25	1.3628	0.20	Q	V
24+30	1.3639	0.16	Q	V
24+35	1.3648	0.13	Q	V
24+40	1.3656	0.11	Q	V
24+45	1.3662	0.10	Q	V
24+50	1.3668	0.08	Q	V
24+55	1.3673	0.07	Q	V
25+ 0	1.3678	0.07	Q	V
25+ 5	1.3682	0.06	Q	V
25+10	1.3686	0.05	Q	V
25+15	1.3689	0.05	Q	V
25+20	1.3692	0.04	Q	V
25+25	1.3695	0.04	Q	V
25+30	1.3697	0.04	Q	V
25+35	1.3699	0.03	Q	V
25+40	1.3701	0.03	Q	V
25+45	1.3703	0.03	Q	V
25+50	1.3705	0.02	Q	V
25+55	1.3706	0.02	Q	V
26+ 0	1.3707	0.02	Q	V
26+ 5	1.3709	0.02	Q	V
26+10	1.3710	0.02	Q	V
26+15	1.3711	0.01	Q	V
26+20	1.3711	0.01	Q	V
26+25	1.3712	0.01	Q	V

26+30	1.3713	0.01	Q	|	|	|	V|
26+35	1.3713	0.01	Q	|	|	|	V|
26+40	1.3714	0.01	Q	|	|	|	V|
26+45	1.3714	0.01	Q	|	|	|	V|
26+50	1.3715	0.01	Q	|	|	|	V|
26+55	1.3715	0.00	Q	|	|	|	V|
27+ 0	1.3715	0.00	Q	|	|	|	V|
27+ 5	1.3715	0.00	Q	|	|	|	V|
27+10	1.3716	0.00	Q	|	|	|	V|
27+15	1.3716	0.00	Q	|	|	|	V|
27+20	1.3716	0.00	Q	|	|	|	V|
27+25	1.3716	0.00	Q	|	|	|	V|

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 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA A2
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
6.51	1	1.20
Rainfall data for year 100		
6.51	6	3.00
Rainfall data for year 100		
6.51	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	6.51	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     6.51   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.431 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       6.51(Ac.)
Catchment Lag time =   0.345 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 24.1686
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       6.51(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        78.73 (CFS))

  1                2.211                   1.740
  2                9.421                   5.677
  3               22.188                  10.052
  4               38.907                  13.163
  5               54.486                  12.265
  6               64.479                   7.867
  7               70.921                   5.072
  8               75.212                   3.378
  9               78.626                   2.688
 10               81.437                   2.213
 11               83.815                   1.872
 12               85.884                   1.629
 13               87.602                   1.352
 14               89.077                   1.161
```

15	90.475	1.101
16	91.583	0.873
17	92.617	0.814
18	93.434	0.643
19	94.204	0.606
20	94.939	0.578
21	95.654	0.563
22	96.232	0.455
23	96.761	0.416
24	97.223	0.364
25	97.657	0.341
26	98.028	0.292
27	98.366	0.266
28	98.646	0.221
29	98.888	0.190
30	99.130	0.190
31	99.371	0.190
32	99.613	0.190
33	99.855	0.190
34	100.000	0.114

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6890	0.1032
4	0.7730	0.0840
5	0.8452	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0200	0.0531
9	1.0692	0.0492
10	1.1153	0.0460
11	1.1586	0.0433
12	1.1996	0.0410
13	1.2498	0.0501
14	1.2981	0.0483
15	1.3447	0.0466
16	1.3899	0.0451
17	1.4336	0.0438
18	1.4762	0.0425
19	1.5176	0.0414
20	1.5580	0.0404
21	1.5973	0.0394
22	1.6358	0.0385
23	1.6734	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8165	0.0347
28	1.8506	0.0341
29	1.8842	0.0335
30	1.9171	0.0330
31	1.9495	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0744	0.0305
36	2.1046	0.0301

37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9353	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	2.9999	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0821	0.0203
77	3.1024	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2595	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3540	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182

96	3.4640	0.0181
97	3.4820	0.0180
98	3.4999	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6911	0.0170
110	3.7080	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160
124	3.9369	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	3.9999	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0465	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1230	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1832	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2719	0.0147
147	4.2865	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3588	0.0144
153	4.3732	0.0143
154	4.3874	0.0143

155	4.4016	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.4999	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8733	0.0128
191	4.8861	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9370	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	4.9999	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121

214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2914	0.0118
225	5.3032	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3618	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4657	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.4999	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6457	0.0111
256	5.6568	0.0111
257	5.6678	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107

273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065

39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083

98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136

157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0252	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0283
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125

216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064

275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      8.69(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f    H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0         2.5        5.0        7.5       10.0
-----------------------------------------------------------------------
  0+ 5      0.0001      0.01  Q          |          |          |          |
  0+10      0.0004      0.04  Q          |          |          |          |
  0+15      0.0011      0.10  Q          |          |          |          |
  0+20      0.0023      0.18  Q          |          |          |          |
  0+25      0.0041      0.25  VQ         |          |          |          |
  0+30      0.0061      0.30  VQ         |          |          |          |
  0+35      0.0084      0.33  VQ         |          |          |          |
  0+40      0.0108      0.35  VQ         |          |          |          |
  0+45      0.0133      0.37  VQ         |          |          |          |
  0+50      0.0160      0.38  VQ         |          |          |          |
  0+55      0.0187      0.39  VQ         |          |          |          |
  1+ 0      0.0215      0.40  VQ         |          |          |          |
  1+ 5      0.0243      0.41  VQ         |          |          |          |
  1+10      0.0272      0.42  VQ         |          |          |          |
  1+15      0.0302      0.43  VQ         |          |          |          |
  1+20      0.0332      0.44  VQ         |          |          |          |
  1+25      0.0362      0.44  VQ         |          |          |          |
  1+30      0.0393      0.45  VQ         |          |          |          |
  1+35      0.0424      0.45  VQ         |          |          |          |
  1+40      0.0455      0.46  VQ         |          |          |          |
  1+45      0.0487      0.46   |Q        |          |          |          |
  1+50      0.0519      0.46   |Q        |          |          |          |
  1+55      0.0551      0.47   |Q        |          |          |          |
  2+ 0      0.0583      0.47   |Q        |          |          |          |
  2+ 5      0.0616      0.47   |Q        |          |          |          |
  2+10      0.0649      0.48   |Q        |          |          |          |
  2+15      0.0682      0.48   |Q        |          |          |          |
  2+20      0.0716      0.48   |Q        |          |          |          |
  2+25      0.0749      0.49   |Q        |          |          |          |
  2+30      0.0783      0.49   |Q        |          |          |          |
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2+35	0.0816	0.49	Q			
2+40	0.0850	0.49	Q			
2+45	0.0885	0.50	Q			
2+50	0.0919	0.50	Q			
2+55	0.0953	0.50	VQ			
3+ 0	0.0988	0.50	Q			
3+ 5	0.1023	0.50	Q			
3+10	0.1057	0.50	Q			
3+15	0.1092	0.51	Q			
3+20	0.1127	0.51	Q			
3+25	0.1162	0.51	Q			
3+30	0.1197	0.51	Q			
3+35	0.1233	0.51	Q			
3+40	0.1268	0.51	Q			
3+45	0.1304	0.52	Q			
3+50	0.1339	0.52	Q			
3+55	0.1375	0.52	Q			
4+ 0	0.1411	0.52	Q			
4+ 5	0.1447	0.52	Q			
4+10	0.1483	0.52	QV			
4+15	0.1519	0.53	QV			
4+20	0.1556	0.53	QV			
4+25	0.1592	0.53	QV			
4+30	0.1629	0.53	QV			
4+35	0.1666	0.53	QV			
4+40	0.1703	0.54	QV			
4+45	0.1740	0.54	QV			
4+50	0.1777	0.54	QV			
4+55	0.1814	0.54	QV			
5+ 0	0.1851	0.54	QV			
5+ 5	0.1889	0.55	QV			
5+10	0.1927	0.55	QV			
5+15	0.1965	0.55	Q V			
5+20	0.2002	0.55	Q V			
5+25	0.2041	0.55	Q V			
5+30	0.2079	0.56	Q V			
5+35	0.2117	0.56	Q V			
5+40	0.2156	0.56	Q V			
5+45	0.2194	0.56	Q V			
5+50	0.2233	0.56	Q V			
5+55	0.2272	0.57	Q V			
6+ 0	0.2311	0.57	Q V			
6+ 5	0.2351	0.57	Q V			
6+10	0.2390	0.57	Q V			
6+15	0.2430	0.58	Q V			
6+20	0.2470	0.58	Q V			
6+25	0.2510	0.58	Q V			
6+30	0.2550	0.58	Q V			
6+35	0.2590	0.58	Q V			
6+40	0.2630	0.59	Q V			
6+45	0.2671	0.59	Q V			
6+50	0.2712	0.59	Q V			
6+55	0.2753	0.59	Q V			
7+ 0	0.2794	0.60	Q V			
7+ 5	0.2835	0.60	Q V			
7+10	0.2877	0.60	Q V			
7+15	0.2918	0.61	Q V			
7+20	0.2960	0.61	Q V			
7+25	0.3002	0.61	Q V			

7+30	0.3045	0.61	Q V			
7+35	0.3087	0.62	Q V			
7+40	0.3130	0.62	Q V			
7+45	0.3173	0.62	Q V			
7+50	0.3216	0.63	Q V			
7+55	0.3259	0.63	Q V			
8+ 0	0.3302	0.63	Q V			
8+ 5	0.3346	0.63	Q V			
8+10	0.3390	0.64	Q V			
8+15	0.3434	0.64	Q V			
8+20	0.3478	0.64	Q V			
8+25	0.3523	0.65	Q V			
8+30	0.3568	0.65	Q V			
8+35	0.3613	0.65	Q V			
8+40	0.3658	0.66	Q V			
8+45	0.3704	0.66	Q V			
8+50	0.3749	0.66	Q V			
8+55	0.3795	0.67	Q V			
9+ 0	0.3842	0.67	Q V			
9+ 5	0.3888	0.68	Q V			
9+10	0.3935	0.68	Q V			
9+15	0.3982	0.68	Q V			
9+20	0.4029	0.69	Q V			
9+25	0.4077	0.69	Q V			
9+30	0.4125	0.70	Q V			
9+35	0.4173	0.70	Q V			
9+40	0.4221	0.70	Q V			
9+45	0.4270	0.71	Q V			
9+50	0.4319	0.71	Q V			
9+55	0.4369	0.72	Q V			
10+ 0	0.4418	0.72	Q V			
10+ 5	0.4468	0.73	Q V			
10+10	0.4519	0.73	Q V			
10+15	0.4569	0.74	Q V			
10+20	0.4620	0.74	Q V			
10+25	0.4672	0.75	Q V			
10+30	0.4723	0.75	Q V			
10+35	0.4775	0.76	Q V			
10+40	0.4828	0.76	Q V			
10+45	0.4881	0.77	Q V			
10+50	0.4934	0.77	Q V			
10+55	0.4987	0.78	Q V			
11+ 0	0.5041	0.78	Q V			
11+ 5	0.5096	0.79	Q V			
11+10	0.5150	0.80	Q V			
11+15	0.5206	0.80	Q V			
11+20	0.5261	0.81	Q V			
11+25	0.5318	0.82	Q V			
11+30	0.5374	0.82	Q	V		
11+35	0.5431	0.83	Q	V		
11+40	0.5489	0.84	Q	V		
11+45	0.5547	0.84	Q	V		
11+50	0.5605	0.85	Q	V		
11+55	0.5664	0.86	Q	V		
12+ 0	0.5724	0.87	Q	V		
12+ 5	0.5784	0.87	Q	V		
12+10	0.5845	0.88	Q	V		
12+15	0.5907	0.90	Q	V		
12+20	0.5969	0.91	Q	V		

```
12+25       0.6033      0.92  |  Q      | V       |         |         |
12+30       0.6097      0.93  |  Q      | V       |         |         |
12+35       0.6162      0.94  |  Q      | V       |         |         |
12+40       0.6228      0.95  |  Q      | V       |         |         |
12+45       0.6294      0.96  |  Q      | V       |         |         |
12+50       0.6361      0.98  |  Q      |  V      |         |         |
12+55       0.6429      0.99  |  Q      |  V      |         |         |
13+ 0       0.6498      1.00  |  Q      |  V      |         |         |
13+ 5       0.6568      1.01  |   Q     |  V      |         |         |
13+10       0.6638      1.02  |   Q     |  V      |         |         |
13+15       0.6710      1.04  |   Q     |  V      |         |         |
13+20       0.6782      1.05  |   Q     |   V     |         |         |
13+25       0.6855      1.06  |   Q     |   V     |         |         |
13+30       0.6930      1.08  |   Q     |   V     |         |         |
13+35       0.7005      1.09  |   Q     |   V     |         |         |
13+40       0.7081      1.11  |   Q     |   V     |         |         |
13+45       0.7159      1.13  |   Q     |   V     |         |         |
13+50       0.7238      1.14  |   Q     |   V     |         |         |
13+55       0.7318      1.16  |   Q     |    V    |         |         |
14+ 0       0.7399      1.18  |   Q     |    V    |         |         |
14+ 5       0.7482      1.20  |   Q     |    V    |         |         |
14+10       0.7566      1.22  |   Q     |    V    |         |         |
14+15       0.7652      1.24  |   Q     |    V    |         |         |
14+20       0.7739      1.27  |    Q    |    V    |         |         |
14+25       0.7828      1.29  |    Q    |     V   |         |         |
14+30       0.7919      1.32  |    Q    |     V   |         |         |
14+35       0.8011      1.35  |    Q    |     V   |         |         |
14+40       0.8106      1.38  |    Q    |     V   |         |         |
14+45       0.8203      1.41  |    Q    |     V   |         |         |
14+50       0.8303      1.44  |    Q    |      V  |         |         |
14+55       0.8405      1.48  |    Q    |      V  |         |         |
15+ 0       0.8510      1.52  |     Q   |      V  |         |         |
15+ 5       0.8618      1.57  |     Q   |      V  |         |         |
15+10       0.8729      1.62  |     Q   |       V |         |         |
15+15       0.8844      1.67  |     Q   |       V |         |         |
15+20       0.8963      1.73  |     Q   |       V |         |         |
15+25       0.9086      1.79  |      Q  |       V |         |         |
15+30       0.9213      1.83  |      Q  |        V|         |         |
15+35       0.9341      1.86  |      Q  |        V|         |         |
15+40       0.9470      1.88  |      Q  |        V|         |         |
15+45       0.9604      1.94  |      Q  |        V|         |         |
15+50       0.9745      2.05  |       Q |         V         |         |
15+55       0.9901      2.26  |        Q|         V         |         |
16+ 0       1.0084      2.66  |         Q         V         |         |
16+ 5       1.0349      3.85  |         |    Q    |V        |         |
16+10       1.0748      5.80  |         |         | VQ      |         |
16+15       1.1278      7.69  |         |         |  V      Q         |
16+20       1.1876      8.69  |         |         |   V     |   Q     |
16+25       1.2424      7.96  |         |         |    V    |Q        |
16+30       1.2837      5.99  |         |         |  Q  V   |         |
16+35       1.3157      4.65  |         |       Q |      V  |         |
16+40       1.3420      3.82  |         |    Q    |      V  |         |
16+45       1.3655      3.41  |         |  Q      |       V |         |
16+50       1.3868      3.09  |         | Q       |       V |         |
16+55       1.4063      2.83  |         |Q        |        V|         |
17+ 0       1.4244      2.62  |         Q         |        V|         |
17+ 5       1.4410      2.41  |        Q|         |        V|         |
17+10       1.4565      2.25  |        Q|         |         V         |
17+15       1.4712      2.14  |       Q |         |         V         |
```

17+20	1.4848	1.98	Q			V
17+25	1.4978	1.88	Q			V
17+30	1.5099	1.76	Q			V
17+35	1.5216	1.69	Q			V
17+40	1.5328	1.63	Q			V
17+45	1.5436	1.57	Q			V
17+50	1.5538	1.48	Q			V
17+55	1.5636	1.43	Q			V
18+ 0	1.5730	1.37	Q			V
18+ 5	1.5821	1.32	Q			V
18+10	1.5908	1.26	Q			V
18+15	1.5992	1.22	Q			V
18+20	1.6072	1.17	Q			V
18+25	1.6150	1.13	Q			V
18+30	1.6225	1.10	Q			V
18+35	1.6299	1.07	Q			V
18+40	1.6371	1.04	Q			V
18+45	1.6441	1.01	Q			V
18+50	1.6507	0.96	Q			V
18+55	1.6568	0.89	Q			V
19+ 0	1.6628	0.87	Q			V
19+ 5	1.6687	0.85	Q			V
19+10	1.6744	0.84	Q			V
19+15	1.6801	0.82	Q			V
19+20	1.6856	0.81	Q			V
19+25	1.6911	0.79	Q			V
19+30	1.6965	0.78	Q			V
19+35	1.7018	0.77	Q			V
19+40	1.7070	0.76	Q			V
19+45	1.7121	0.75	Q			V
19+50	1.7172	0.74	Q			V
19+55	1.7222	0.73	Q			V
20+ 0	1.7271	0.72	Q			V
20+ 5	1.7320	0.71	Q			V
20+10	1.7368	0.70	Q			V
20+15	1.7415	0.69	Q			V
20+20	1.7462	0.68	Q			V
20+25	1.7509	0.67	Q			V
20+30	1.7555	0.67	Q			V
20+35	1.7600	0.66	Q			V
20+40	1.7645	0.65	Q			V
20+45	1.7689	0.65	Q			V
20+50	1.7733	0.64	Q			V
20+55	1.7777	0.63	Q			V
21+ 0	1.7820	0.63	Q			V
21+ 5	1.7863	0.62	Q			V
21+10	1.7905	0.61	Q			V
21+15	1.7947	0.61	Q			V
21+20	1.7988	0.60	Q			V
21+25	1.8030	0.60	Q			V
21+30	1.8070	0.59	Q			V
21+35	1.8111	0.59	Q			V
21+40	1.8151	0.58	Q			V
21+45	1.8191	0.58	Q			V
21+50	1.8230	0.57	Q			V
21+55	1.8269	0.57	Q			V
22+ 0	1.8308	0.56	Q			V
22+ 5	1.8347	0.56	Q			V
22+10	1.8385	0.56	Q			V

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   22+15        1.8423       0.55  | Q        |          |          |       V |
   22+20        1.8460       0.55  | Q        |          |          |       V |
   22+25        1.8498       0.54  | Q        |          |          |       V |
   22+30        1.8535       0.54  | Q        |          |          |       V |
   22+35        1.8572       0.54  | Q        |          |          |       V |
   22+40        1.8608       0.53  | Q        |          |          |       V |
   22+45        1.8645       0.53  | Q        |          |          |       V |
   22+50        1.8681       0.52  | Q        |          |          |       V |
   22+55        1.8717       0.52  | Q        |          |          |       V |
   23+ 0        1.8752       0.52  | Q        |          |          |       V |
   23+ 5        1.8788       0.51  | Q        |          |          |       V |
   23+10        1.8823       0.51  | Q        |          |          |       V |
   23+15        1.8858       0.51  | Q        |          |          |       V |
   23+20        1.8893       0.50  | Q        |          |          |        V|
   23+25        1.8927       0.50  | Q        |          |          |        V|
   23+30        1.8962       0.50  |Q         |          |          |        V|
   23+35        1.8996       0.50  |Q         |          |          |        V|
   23+40        1.9030       0.49  |Q         |          |          |        V|
   23+45        1.9063       0.49  |Q         |          |          |        V|
   23+50        1.9097       0.49  |Q         |          |          |        V|
   23+55        1.9130       0.48  |Q         |          |          |        V|
   24+ 0        1.9163       0.48  |Q         |          |          |        V|
   24+ 5        1.9195       0.47  |Q         |          |          |        V|
   24+10        1.9225       0.43  |Q         |          |          |        V|
   24+15        1.9251       0.37  |Q         |          |          |        V|
   24+20        1.9271       0.29  |Q         |          |          |        V|
   24+25        1.9286       0.22  Q          |          |          |        V|
   24+30        1.9298       0.17  Q          |          |          |        V|
   24+35        1.9307       0.14  Q          |          |          |        V|
   24+40        1.9315       0.12  Q          |          |          |        V|
   24+45        1.9323       0.10  Q          |          |          |        V|
   24+50        1.9329       0.09  Q          |          |          |        V|
   24+55        1.9334       0.08  Q          |          |          |        V|
   25+ 0        1.9339       0.07  Q          |          |          |        V|
   25+ 5        1.9343       0.06  Q          |          |          |        V|
   25+10        1.9346       0.05  Q          |          |          |        V|
   25+15        1.9350       0.05  Q          |          |          |        V|
   25+20        1.9352       0.04  Q          |          |          |        V|
   25+25        1.9355       0.04  Q          |          |          |        V|
   25+30        1.9357       0.03  Q          |          |          |        V|
   25+35        1.9359       0.03  Q          |          |          |        V|
   25+40        1.9361       0.02  Q          |          |          |        V|
   25+45        1.9362       0.02  Q          |          |          |        V|
   25+50        1.9363       0.02  Q          |          |          |        V|
   25+55        1.9364       0.02  Q          |          |          |        V|
   26+ 0        1.9365       0.01  Q          |          |          |        V|
   26+ 5        1.9366       0.01  Q          |          |          |        V|
   26+10        1.9367       0.01  Q          |          |          |        V|
   26+15        1.9367       0.01  Q          |          |          |        V|
   26+20        1.9368       0.01  Q          |          |          |        V|
   26+25        1.9368       0.01  Q          |          |          |        V|
   26+30        1.9368       0.00  Q          |          |          |        V|
   26+35        1.9368       0.00  Q          |          |          |        V|
   26+40        1.9369       0.00  Q          |          |          |        V|
   26+45        1.9369       0.00  Q          |          |          |          V
-----------------------------------------------------------------------
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U n i t   H y d r o g r a p h   A n a l y s i s

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA A3
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.78	1	1.20
Rainfall data for year 100		
4.78	6	3.00
Rainfall data for year 100		
4.78	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	4.78	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     4.78   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.364 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       4.78(Ac.)
Catchment Lag time =   0.291 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 28.6172
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       4.78(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values           ((CFS))
---------------------------------------------------------------------
            (K =        57.81 (CFS))

  1                2.724                   1.574
  2               12.476                   5.637
  3               29.692                   9.952
  4               49.408                  11.398
  5               63.026                   7.872
  6               70.947                   4.579
  7               75.926                   2.878
  8               79.750                   2.211
  9               82.813                   1.770
 10               85.389                   1.489
 11               87.489                   1.214
 12               89.246                   1.016
 13               90.827                   0.914
 14               92.099                   0.735
```

15	93.178	0.624
16	94.092	0.528
17	94.966	0.505
18	95.792	0.478
19	96.447	0.379
20	97.042	0.344
21	97.560	0.299
22	98.014	0.263
23	98.410	0.229
24	98.725	0.182
25	99.011	0.165
26	99.297	0.165
27	99.584	0.165
28	100.000	0.083

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9671	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1154	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279

43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176

102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140

161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120

220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106

279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067

45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086

104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149

163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108

222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062

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    281             0.0109          0.0047            0.0061
    282             0.0108          0.0047            0.0061
    283             0.0107          0.0047            0.0061
    284             0.0107          0.0047            0.0060
    285             0.0106          0.0046            0.0060
    286             0.0106          0.0046            0.0060
    287             0.0105          0.0046            0.0059
    288             0.0105          0.0046            0.0059
    ----------------------------------------------------------------------
    ----------------------------------------------------------------------
    Total soil rain loss =      2.43(In)
    Total effective rainfall =      3.57(In)
    Peak flow rate in flood hydrograph =      6.96(CFS)
    -----------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R   S T O R M
                   R u n o f f     H y d r o g r a p h
    ----------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0004      0.04  Q         |         |         |         |
  0+15       0.0011      0.10  Q         |         |         |         |
  0+20       0.0022      0.17  Q         |         |         |         |
  0+25       0.0037      0.21  Q         |         |         |         |
  0+30       0.0054      0.24  Q         |         |         |         |
  0+35       0.0071      0.26  VQ        |         |         |         |
  0+40       0.0090      0.27  VQ        |         |         |         |
  0+45       0.0110      0.28  VQ        |         |         |         |
  0+50       0.0130      0.29  VQ        |         |         |         |
  0+55       0.0151      0.30  VQ        |         |         |         |
  1+ 0       0.0172      0.31  VQ        |         |         |         |
  1+ 5       0.0194      0.31  VQ        |         |         |         |
  1+10       0.0216      0.32  VQ        |         |         |         |
  1+15       0.0238      0.32  VQ        |         |         |         |
  1+20       0.0261      0.33  VQ        |         |         |         |
  1+25       0.0284      0.33  VQ        |         |         |         |
  1+30       0.0307      0.34  VQ        |         |         |         |
  1+35       0.0330      0.34  VQ        |         |         |         |
  1+40       0.0354      0.34  VQ        |         |         |         |
  1+45       0.0378      0.35  |Q        |         |         |         |
  1+50       0.0402      0.35  |Q        |         |         |         |
  1+55       0.0426      0.35  |Q        |         |         |         |
  2+ 0       0.0450      0.35  |Q        |         |         |         |
  2+ 5       0.0474      0.35  |Q        |         |         |         |
  2+10       0.0499      0.36  |Q        |         |         |         |
  2+15       0.0524      0.36  |Q        |         |         |         |
  2+20       0.0548      0.36  |Q        |         |         |         |
  2+25       0.0573      0.36  |Q        |         |         |         |
  2+30       0.0598      0.36  |Q        |         |         |         |
  2+35       0.0623      0.36  |Q        |         |         |         |
  2+40       0.0648      0.36  |Q        |         |         |         |
  2+45       0.0673      0.37  |Q        |         |         |         |
  2+50       0.0698      0.37  |Q        |         |         |         |
  2+55       0.0724      0.37  |QV       |         |         |         |
  3+ 0       0.0749      0.37  |QV       |         |         |         |
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3+ 5	0.0775	0.37	QV			
3+10	0.0800	0.37	QV			
3+15	0.0826	0.37	QV			
3+20	0.0851	0.37	QV			
3+25	0.0877	0.37	QV			
3+30	0.0903	0.38	QV			
3+35	0.0929	0.38	QV			
3+40	0.0955	0.38	QV			
3+45	0.0981	0.38	QV			
3+50	0.1007	0.38	QV			
3+55	0.1034	0.38	QV			
4+ 0	0.1060	0.38	QV			
4+ 5	0.1086	0.38	Q V			
4+10	0.1113	0.39	Q V			
4+15	0.1140	0.39	Q V			
4+20	0.1166	0.39	Q V			
4+25	0.1193	0.39	Q V			
4+30	0.1220	0.39	Q V			
4+35	0.1247	0.39	Q V			
4+40	0.1274	0.39	Q V			
4+45	0.1301	0.39	Q V			
4+50	0.1329	0.40	Q V			
4+55	0.1356	0.40	Q V			
5+ 0	0.1384	0.40	Q V			
5+ 5	0.1411	0.40	Q V			
5+10	0.1439	0.40	Q V			
5+15	0.1467	0.40	Q V			
5+20	0.1494	0.41	Q V			
5+25	0.1522	0.41	Q V			
5+30	0.1551	0.41	Q V			
5+35	0.1579	0.41	Q V			
5+40	0.1607	0.41	Q V			
5+45	0.1636	0.41	Q V			
5+50	0.1664	0.41	Q V			
5+55	0.1693	0.42	Q V			
6+ 0	0.1722	0.42	Q V			
6+ 5	0.1750	0.42	Q V			
6+10	0.1779	0.42	Q V			
6+15	0.1809	0.42	Q V			
6+20	0.1838	0.42	Q V			
6+25	0.1867	0.43	Q V			
6+30	0.1897	0.43	Q V			
6+35	0.1926	0.43	Q V			
6+40	0.1956	0.43	Q V			
6+45	0.1986	0.43	Q V			
6+50	0.2016	0.44	Q V			
6+55	0.2046	0.44	Q V			
7+ 0	0.2076	0.44	Q V			
7+ 5	0.2107	0.44	Q V			
7+10	0.2137	0.44	Q V			
7+15	0.2168	0.45	Q V			
7+20	0.2199	0.45	Q V			
7+25	0.2230	0.45	Q V			
7+30	0.2261	0.45	Q V			
7+35	0.2292	0.45	Q V			
7+40	0.2323	0.46	Q V			
7+45	0.2355	0.46	Q V			
7+50	0.2386	0.46	Q V			
7+55	0.2418	0.46	Q V			

```
 8+ 0       0.2450      0.46   |Q    V   |         |         |         |
 8+ 5       0.2482      0.47   |Q     V  |         |         |         |
 8+10       0.2515      0.47   |Q     V  |         |         |         |
 8+15       0.2547      0.47   |Q     V  |         |         |         |
 8+20       0.2580      0.47   |Q     V  |         |         |         |
 8+25       0.2613      0.48   |Q     V  |         |         |         |
 8+30       0.2646      0.48   |Q     V  |         |         |         |
 8+35       0.2679      0.48   |Q     V  |         |         |         |
 8+40       0.2712      0.48   |Q     V  |         |         |         |
 8+45       0.2746      0.49   |Q     V  |         |         |         |
 8+50       0.2779      0.49   |Q     V  |         |         |         |
 8+55       0.2813      0.49   |Q     V  |         |         |         |
 9+ 0       0.2847      0.49   |Q      V |         |         |         |
 9+ 5       0.2881      0.50   |Q      V |         |         |         |
 9+10       0.2916      0.50   | Q     V |         |         |         |
 9+15       0.2950      0.50   | Q     V |         |         |         |
 9+20       0.2985      0.51   | Q     V |         |         |         |
 9+25       0.3020      0.51   | Q     V |         |         |         |
 9+30       0.3056      0.51   | Q     V |         |         |         |
 9+35       0.3091      0.52   | Q     V |         |         |         |
 9+40       0.3127      0.52   | Q     V |         |         |         |
 9+45       0.3163      0.52   | Q     V |         |         |         |
 9+50       0.3199      0.52   | Q      V|         |         |         |
 9+55       0.3235      0.53   | Q      V|         |         |         |
10+ 0       0.3272      0.53   | Q      V|         |         |         |
10+ 5       0.3309      0.53   | Q      V|         |         |         |
10+10       0.3346      0.54   | Q      V|         |         |         |
10+15       0.3383      0.54   | Q      V|         |         |         |
10+20       0.3421      0.55   | Q      V|         |         |         |
10+25       0.3458      0.55   | Q      V|         |         |         |
10+30       0.3497      0.55   | Q      V|         |         |         |
10+35       0.3535      0.56   | Q      V|         |         |         |
10+40       0.3574      0.56   | Q       V         |         |         |
10+45       0.3612      0.57   | Q       V         |         |         |
10+50       0.3652      0.57   | Q       V         |         |         |
10+55       0.3691      0.57   | Q       V         |         |         |
11+ 0       0.3731      0.58   | Q       V         |         |         |
11+ 5       0.3771      0.58   | Q       V         |         |         |
11+10       0.3811      0.59   | Q       V         |         |         |
11+15       0.3852      0.59   | Q       V         |         |         |
11+20       0.3893      0.60   | Q       V         |         |         |
11+25       0.3935      0.60   | Q       |V        |         |         |
11+30       0.3976      0.61   | Q       |V        |         |         |
11+35       0.4019      0.61   | Q       |V        |         |         |
11+40       0.4061      0.62   | Q       |V        |         |         |
11+45       0.4104      0.62   | Q       |V        |         |         |
11+50       0.4147      0.63   | Q       |V        |         |         |
11+55       0.4191      0.63   | Q       |V        |         |         |
12+ 0       0.4235      0.64   | Q       |V        |         |         |
12+ 5       0.4279      0.65   | Q       | V       |         |         |
12+10       0.4324      0.65   | Q       | V       |         |         |
12+15       0.4370      0.66   | Q       | V       |         |         |
12+20       0.4416      0.67   | Q       | V       |         |         |
12+25       0.4463      0.68   | Q       | V       |         |         |
12+30       0.4511      0.69   | Q       | V       |         |         |
12+35       0.4559      0.70   | Q       | V       |         |         |
12+40       0.4607      0.71   | Q       | V       |         |         |
12+45       0.4657      0.71   | Q       |  V      |         |         |
12+50       0.4706      0.72   | Q       |  V      |         |         |
```

12+55	0.4757	0.73	Q	V		
13+ 0	0.4808	0.74	Q	V		
13+ 5	0.4859	0.75	Q	V		
13+10	0.4911	0.76	Q	V		
13+15	0.4964	0.77	Q	V		
13+20	0.5018	0.78	Q	V		
13+25	0.5072	0.79	Q	V		
13+30	0.5127	0.80	Q	V		
13+35	0.5183	0.81	Q	V		
13+40	0.5240	0.82	Q	V		
13+45	0.5297	0.84	Q	V		
13+50	0.5356	0.85	Q	V		
13+55	0.5415	0.86	Q	V		
14+ 0	0.5476	0.88	Q	V		
14+ 5	0.5537	0.89	Q	V		
14+10	0.5600	0.91	Q	V		
14+15	0.5663	0.92	Q	V		
14+20	0.5728	0.94	Q	V		
14+25	0.5794	0.96	Q	V		
14+30	0.5862	0.98	Q	V		
14+35	0.5931	1.00	Q	V		
14+40	0.6002	1.03	Q	V		
14+45	0.6074	1.05	Q	V		
14+50	0.6149	1.08	Q	V		
14+55	0.6225	1.11	Q	V		
15+ 0	0.6303	1.14	Q	V		
15+ 5	0.6384	1.17	Q	V		
15+10	0.6468	1.21	Q	V		
15+15	0.6554	1.25	Q	V		
15+20	0.6644	1.30	Q	V		
15+25	0.6737	1.35	Q	V		
15+30	0.6831	1.37	Q	V		
15+35	0.6926	1.38	Q	V		
15+40	0.7023	1.40	Q	V		
15+45	0.7123	1.45	Q		V	
15+50	0.7230	1.56	Q		V	
15+55	0.7350	1.74	Q		V	
16+ 0	0.7495	2.10	Q		V	
16+ 5	0.7714	3.18		Q	V	
16+10	0.8064	5.08			Q V	
16+15	0.8528	6.74			V Q	
16+20	0.9008	6.96			V Q	
16+25	0.9375	5.34			Q V	
16+30	0.9640	3.85		Q	V	
16+35	0.9850	3.04		Q	V	
16+40	1.0033	2.66		Q	V	
16+45	1.0196	2.38	Q		V	
16+50	1.0345	2.16	Q		V	
16+55	1.0481	1.96	Q		V	
17+ 0	1.0605	1.81	Q		V	
17+ 5	1.0721	1.69	Q			V
17+10	1.0828	1.55	Q			V
17+15	1.0928	1.45	Q			V
17+20	1.1022	1.36	Q			V
17+25	1.1112	1.30	Q			V
17+30	1.1198	1.25	Q			V
17+35	1.1278	1.17	Q			V
17+40	1.1355	1.12	Q			V
17+45	1.1428	1.06	Q			V

17+50	1.1498	1.02	Q			V
17+55	1.1565	0.97	Q			V
18+ 0	1.1629	0.93	Q			V
18+ 5	1.1690	0.89	Q			V
18+10	1.1750	0.87	Q			V
18+15	1.1807	0.83	Q			V
18+20	1.1861	0.77	Q			V
18+25	1.1910	0.72	Q			V
18+30	1.1959	0.70	Q			V
18+35	1.2006	0.68	Q			V
18+40	1.2052	0.67	Q			V
18+45	1.2097	0.65	Q			V
18+50	1.2141	0.64	Q			V
18+55	1.2184	0.63	Q			V
19+ 0	1.2227	0.62	Q			V
19+ 5	1.2268	0.61	Q			V
19+10	1.2309	0.59	Q			V
19+15	1.2350	0.59	Q			V
19+20	1.2389	0.58	Q			V
19+25	1.2428	0.57	Q			V
19+30	1.2467	0.56	Q			V
19+35	1.2505	0.55	Q			V
19+40	1.2542	0.54	Q			V
19+45	1.2579	0.54	Q			V
19+50	1.2615	0.53	Q			V
19+55	1.2651	0.52	Q			V
20+ 0	1.2687	0.52	Q			V
20+ 5	1.2722	0.51	Q			V
20+10	1.2756	0.50	Q			V
20+15	1.2791	0.50	Q			V
20+20	1.2825	0.49	Q			V
20+25	1.2858	0.49	Q			V
20+30	1.2891	0.48	Q			V
20+35	1.2924	0.48	Q			V
20+40	1.2956	0.47	Q			V
20+45	1.2988	0.47	Q			V
20+50	1.3020	0.46	Q			V
20+55	1.3052	0.46	Q			V
21+ 0	1.3083	0.45	Q			V
21+ 5	1.3114	0.45	Q			V
21+10	1.3144	0.44	Q			V
21+15	1.3175	0.44	Q			V
21+20	1.3205	0.44	Q			V
21+25	1.3235	0.43	Q			V
21+30	1.3264	0.43	Q			V
21+35	1.3294	0.43	Q			V
21+40	1.3323	0.42	Q			V
21+45	1.3351	0.42	Q			V
21+50	1.3380	0.42	Q			V
21+55	1.3408	0.41	Q			V
22+ 0	1.3437	0.41	Q			V
22+ 5	1.3465	0.41	Q			V
22+10	1.3492	0.40	Q			V
22+15	1.3520	0.40	Q			V
22+20	1.3547	0.40	Q			V
22+25	1.3574	0.39	Q			V
22+30	1.3601	0.39	Q			V
22+35	1.3628	0.39	Q			V
22+40	1.3655	0.39	Q			V

```
   22+45      1.3681     0.38  |Q          |          |          |       V |
   22+50      1.3707     0.38  |Q          |          |          |       V |
   22+55      1.3733     0.38  |Q          |          |          |       V |
   23+ 0      1.3759     0.38  |Q          |          |          |       V |
   23+ 5      1.3785     0.37  |Q          |          |          |       V |
   23+10      1.3811     0.37  |Q          |          |          |       V |
   23+15      1.3836     0.37  |Q          |          |          |        V|
   23+20      1.3861     0.37  |Q          |          |          |        V|
   23+25      1.3886     0.36  |Q          |          |          |        V|
   23+30      1.3911     0.36  |Q          |          |          |        V|
   23+35      1.3936     0.36  |Q          |          |          |        V|
   23+40      1.3961     0.36  |Q          |          |          |        V|
   23+45      1.3985     0.36  |Q          |          |          |        V|
   23+50      1.4010     0.35  |Q          |          |          |        V|
   23+55      1.4034     0.35  |Q          |          |          |        V|
   24+ 0      1.4058     0.35  |Q          |          |          |        V|
   24+ 5      1.4081     0.34  |Q          |          |          |        V|
   24+10      1.4102     0.30  |Q          |          |          |        V|
   24+15      1.4119     0.24  Q           |          |          |        V|
   24+20      1.4131     0.18  Q           |          |          |        V|
   24+25      1.4140     0.13  Q           |          |          |        V|
   24+30      1.4147     0.10  Q           |          |          |        V|
   24+35      1.4153     0.08  Q           |          |          |        V|
   24+40      1.4158     0.07  Q           |          |          |        V|
   24+45      1.4162     0.06  Q           |          |          |        V|
   24+50      1.4165     0.05  Q           |          |          |        V|
   24+55      1.4168     0.04  Q           |          |          |        V|
   25+ 0      1.4171     0.04  Q           |          |          |        V|
   25+ 5      1.4173     0.03  Q           |          |          |        V|
   25+10      1.4175     0.03  Q           |          |          |        V|
   25+15      1.4176     0.02  Q           |          |          |        V|
   25+20      1.4177     0.02  Q           |          |          |        V|
   25+25      1.4179     0.02  Q           |          |          |        V|
   25+30      1.4180     0.01  Q           |          |          |        V|
   25+35      1.4180     0.01  Q           |          |          |        V|
   25+40      1.4181     0.01  Q           |          |          |        V|
   25+45      1.4181     0.01  Q           |          |          |        V|
   25+50      1.4182     0.01  Q           |          |          |        V|
   25+55      1.4182     0.00  Q           |          |          |        V|
   26+ 0      1.4182     0.00  Q           |          |          |        V|
   26+ 5      1.4183     0.00  Q           |          |          |        V|
   26+10      1.4183     0.00  Q           |          |          |        V|
   26+15      1.4183     0.00  Q           |          |          |        V|
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U n i t   H y d r o g r a p h   A n a l y s i s

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Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA A4
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
7.83	1	1.20
Rainfall data for year 100		
7.83	6	3.00
Rainfall data for year 100		
7.83	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	7.83	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
7.83	1.000	76.0	76.0	3.16	0.563

Area-averaged catchment yield fraction, Y = 0.563
Area-averaged low loss fraction, Yb = 0.437
User entry of time of concentration = 0.629 (hours)
++
Watershed area = 7.83(Ac.)
Catchment Lag time = 0.503 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 16.5607
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 7.83(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.200(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 94.69 (CFS))	
1	1.440	1.364
2	5.201	3.561
3	11.555	6.017
4	20.546	8.514
5	31.703	10.564
6	43.580	11.247
7	54.021	9.886
8	61.522	7.103
9	66.922	5.113
10	71.012	3.873
11	74.077	2.902
12	76.586	2.376
13	78.840	2.134
14	80.800	1.856

15	82.513	1.622
16	84.088	1.491
17	85.525	1.361
18	86.766	1.175
19	87.881	1.055
20	88.876	0.942
21	89.870	0.941
22	90.764	0.847
23	91.495	0.692
24	92.224	0.690
25	92.881	0.623
26	93.414	0.504
27	93.943	0.502
28	94.462	0.491
29	94.959	0.471
30	95.456	0.470
31	95.910	0.430
32	96.277	0.347
33	96.641	0.345
34	96.985	0.325
35	97.284	0.284
36	97.582	0.282
37	97.861	0.264
38	98.094	0.221
39	98.326	0.220
40	98.539	0.202
41	98.707	0.159
42	98.873	0.157
43	99.038	0.157
44	99.204	0.157
45	99.370	0.157
46	99.535	0.157
47	99.701	0.157
48	99.866	0.157
49	100.000	0.127

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5858	0.1419
3	0.6890	0.1031
4	0.7730	0.0840
5	0.8452	0.0722
6	0.9091	0.0639
7	0.9669	0.0578
8	1.0200	0.0530
9	1.0692	0.0492
10	1.1152	0.0460
11	1.1585	0.0433
12	1.1996	0.0410
13	1.2497	0.0501
14	1.2980	0.0483
15	1.3446	0.0466
16	1.3898	0.0451
17	1.4336	0.0438
18	1.4761	0.0425
19	1.5175	0.0414
20	1.5579	0.0404
21	1.5973	0.0394

22	1.6358	0.0385
23	1.6734	0.0376
24	1.7102	0.0368
25	1.7463	0.0361
26	1.7817	0.0354
27	1.8165	0.0347
28	1.8506	0.0341
29	1.8841	0.0335
30	1.9171	0.0330
31	1.9495	0.0324
32	1.9814	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0744	0.0305
36	2.1045	0.0301
37	2.1342	0.0297
38	2.1635	0.0293
39	2.1925	0.0289
40	2.2210	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3047	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4895	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7328	0.0234
61	2.7560	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8470	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9353	0.0218
70	2.9570	0.0217
71	2.9785	0.0215
72	2.9999	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0821	0.0203
77	3.1023	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198

81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2595	0.0192
86	3.2786	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3353	0.0188
90	3.3540	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4459	0.0182
96	3.4640	0.0181
97	3.4820	0.0180
98	3.4999	0.0179
99	3.5177	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5706	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6911	0.0170
110	3.7080	0.0169
111	3.7248	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7748	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8567	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160
124	3.9369	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	3.9999	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0465	0.0155
132	4.0619	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1078	0.0152
136	4.1230	0.0152
137	4.1382	0.0151
138	4.1532	0.0151
139	4.1683	0.0150

140	4.1832	0.0150
141	4.1981	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2719	0.0147
147	4.2865	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3588	0.0144
153	4.3731	0.0143
154	4.3874	0.0143
155	4.4016	0.0142
156	4.4158	0.0142
157	4.4299	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.4999	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5551	0.0137
167	4.5688	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6232	0.0135
172	4.6367	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6903	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7433	0.0132
181	4.7565	0.0132
182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8733	0.0128
191	4.8861	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9370	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126

199	4.9874	0.0125
200	4.9999	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0620	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1477	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1840	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2320	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2914	0.0118
225	5.3032	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3618	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4657	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.4999	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6235	0.0111
254	5.6347	0.0111
255	5.6457	0.0111
256	5.6568	0.0111
257	5.6678	0.0110

258	5.6788	0.0110
259	5.6898	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7770	0.0108
268	5.7879	0.0108
269	5.7986	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8842	0.0106
278	5.8949	0.0106
279	5.9054	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	5.9999	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062

24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077

83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113

142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0132	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0530	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1031	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0252	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0283
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217

201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071

260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      8.14(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0003      0.03  Q         |         |         |         |
  0+15       0.0007      0.06  Q         |         |         |         |
  0+20       0.0015      0.11  Q         |         |         |         |
  0+25       0.0027      0.18  Q         |         |         |         |
  0+30       0.0044      0.24  Q         |         |         |         |
  0+35       0.0065      0.30  VQ        |         |         |         |
  0+40       0.0088      0.34  VQ        |         |         |         |
  0+45       0.0114      0.38  VQ        |         |         |         |
  0+50       0.0142      0.40  VQ        |         |         |         |
  0+55       0.0170      0.42  VQ        |         |         |         |
  1+ 0       0.0200      0.43  VQ        |         |         |         |
  1+ 5       0.0231      0.45  VQ        |         |         |         |
  1+10       0.0262      0.46  VQ        |         |         |         |
  1+15       0.0295      0.47  VQ        |         |         |         |
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1+20	0.0328	0.48	VQ
1+25	0.0361	0.49	VQ
1+30	0.0396	0.50	VQ
1+35	0.0430	0.50	V Q
1+40	0.0465	0.51	V Q
1+45	0.0501	0.52	V Q
1+50	0.0537	0.52	V Q
1+55	0.0574	0.53	V Q
2+ 0	0.0611	0.54	VQ
2+ 5	0.0648	0.54	VQ
2+10	0.0685	0.55	VQ
2+15	0.0723	0.55	VQ
2+20	0.0761	0.55	VQ
2+25	0.0800	0.56	VQ
2+30	0.0839	0.56	VQ
2+35	0.0878	0.57	VQ
2+40	0.0917	0.57	VQ
2+45	0.0957	0.57	VQ
2+50	0.0996	0.58	VQ
2+55	0.1037	0.58	VQ
3+ 0	0.1077	0.59	VQ
3+ 5	0.1117	0.59	VQ
3+10	0.1158	0.59	VQ
3+15	0.1199	0.59	Q
3+20	0.1240	0.60	Q
3+25	0.1282	0.60	Q
3+30	0.1323	0.60	Q
3+35	0.1365	0.61	Q
3+40	0.1407	0.61	Q
3+45	0.1449	0.61	Q
3+50	0.1491	0.61	Q
3+55	0.1534	0.62	Q
4+ 0	0.1577	0.62	Q
4+ 5	0.1619	0.62	Q
4+10	0.1663	0.63	Q
4+15	0.1706	0.63	Q
4+20	0.1749	0.63	QV
4+25	0.1793	0.63	QV
4+30	0.1836	0.63	QV
4+35	0.1880	0.64	QV
4+40	0.1924	0.64	QV
4+45	0.1968	0.64	QV
4+50	0.2012	0.64	QV
4+55	0.2057	0.64	QV
5+ 0	0.2101	0.65	QV
5+ 5	0.2146	0.65	QV
5+10	0.2191	0.65	QV
5+15	0.2236	0.65	QV
5+20	0.2281	0.66	QV
5+25	0.2327	0.66	QV
5+30	0.2372	0.66	Q V
5+35	0.2418	0.66	Q V
5+40	0.2464	0.67	Q V
5+45	0.2510	0.67	Q V
5+50	0.2556	0.67	Q V
5+55	0.2602	0.67	Q V
6+ 0	0.2649	0.68	Q V
6+ 5	0.2696	0.68	Q V
6+10	0.2743	0.68	Q V

6+15	0.2790	0.68	Q V			
6+20	0.2837	0.69	Q V			
6+25	0.2885	0.69	Q V			
6+30	0.2933	0.69	Q V			
6+35	0.2980	0.70	Q V			
6+40	0.3029	0.70	Q V			
6+45	0.3077	0.70	Q V			
6+50	0.3125	0.70	Q V			
6+55	0.3174	0.71	Q V			
7+ 0	0.3223	0.71	Q V			
7+ 5	0.3272	0.71	Q V			
7+10	0.3321	0.72	Q V			
7+15	0.3371	0.72	Q V			
7+20	0.3421	0.72	Q V			
7+25	0.3471	0.73	Q V			
7+30	0.3521	0.73	Q V			
7+35	0.3571	0.73	Q V			
7+40	0.3622	0.74	Q V			
7+45	0.3673	0.74	Q V			
7+50	0.3724	0.74	Q V			
7+55	0.3776	0.75	Q V			
8+ 0	0.3827	0.75	Q V			
8+ 5	0.3879	0.75	Q V			
8+10	0.3931	0.76	Q V			
8+15	0.3984	0.76	Q V			
8+20	0.4036	0.76	Q V			
8+25	0.4089	0.77	Q V			
8+30	0.4142	0.77	Q V			
8+35	0.4196	0.78	Q V			
8+40	0.4250	0.78	Q V			
8+45	0.4304	0.78	Q V			
8+50	0.4358	0.79	Q V			
8+55	0.4412	0.79	Q V			
9+ 0	0.4467	0.80	Q V			
9+ 5	0.4522	0.80	Q V			
9+10	0.4578	0.81	Q V			
9+15	0.4634	0.81	Q V			
9+20	0.4690	0.81	Q V			
9+25	0.4746	0.82	Q V			
9+30	0.4803	0.82	Q V			
9+35	0.4860	0.83	Q V			
9+40	0.4917	0.83	Q V			
9+45	0.4975	0.84	Q V			
9+50	0.5033	0.84	Q V			
9+55	0.5092	0.85	Q V			
10+ 0	0.5150	0.85	Q V			
10+ 5	0.5210	0.86	Q V			
10+10	0.5269	0.86	Q V			
10+15	0.5329	0.87	Q V			
10+20	0.5389	0.88	Q V			
10+25	0.5450	0.88	Q V			
10+30	0.5511	0.89	Q V			
10+35	0.5573	0.89	Q V			
10+40	0.5635	0.90	Q V			
10+45	0.5697	0.91	Q V			
10+50	0.5760	0.91	Q V			
10+55	0.5823	0.92	Q V			
11+ 0	0.5887	0.93	Q	V		
11+ 5	0.5951	0.93	Q	V		

```
11+10       0.6016      0.94  |  Q      V         |         |         |
11+15       0.6081      0.95  |  Q      V         |         |         |
11+20       0.6146      0.95  |  Q      V         |         |         |
11+25       0.6213      0.96  |  Q      V         |         |         |
11+30       0.6279      0.97  |  Q      V         |         |         |
11+35       0.6347      0.98  |  Q      V         |         |         |
11+40       0.6414      0.98  |  Q      |V        |         |         |
11+45       0.6483      0.99  |  Q      |V        |         |         |
11+50       0.6552      1.00  |   Q     |V        |         |         |
11+55       0.6621      1.01  |   Q     |V        |         |         |
12+ 0       0.6691      1.02  |   Q     |V        |         |         |
12+ 5       0.6762      1.03  |   Q     |V        |         |         |
12+10       0.6834      1.04  |   Q     |V        |         |         |
12+15       0.6906      1.05  |   Q     |V        |         |         |
12+20       0.6979      1.06  |   Q     |V        |         |         |
12+25       0.7053      1.07  |   Q     | V       |         |         |
12+30       0.7128      1.09  |   Q     | V       |         |         |
12+35       0.7204      1.10  |   Q     | V       |         |         |
12+40       0.7281      1.12  |   Q     | V       |         |         |
12+45       0.7358      1.13  |   Q     | V       |         |         |
12+50       0.7437      1.14  |   Q     | V       |         |         |
12+55       0.7516      1.15  |   Q     | V       |         |         |
13+ 0       0.7597      1.17  |   Q     |  V      |         |         |
13+ 5       0.7678      1.18  |   Q     |  V      |         |         |
13+10       0.7761      1.20  |   Q     |  V      |         |         |
13+15       0.7844      1.21  |   Q     |  V      |         |         |
13+20       0.7928      1.22  |   Q     |  V      |         |         |
13+25       0.8014      1.24  |   Q     |  V      |         |         |
13+30       0.8100      1.26  |    Q    |  V      |         |         |
13+35       0.8188      1.27  |    Q    |   V     |         |         |
13+40       0.8277      1.29  |    Q    |   V     |         |         |
13+45       0.8367      1.31  |    Q    |   V     |         |         |
13+50       0.8458      1.33  |    Q    |   V     |         |         |
13+55       0.8551      1.35  |    Q    |   V     |         |         |
14+ 0       0.8646      1.37  |    Q    |   V     |         |         |
14+ 5       0.8741      1.39  |    Q    |    V    |         |         |
14+10       0.8839      1.41  |    Q    |    V    |         |         |
14+15       0.8938      1.44  |    Q    |    V    |         |         |
14+20       0.9038      1.46  |    Q    |    V    |         |         |
14+25       0.9141      1.49  |    Q    |    V    |         |         |
14+30       0.9245      1.52  |     Q   |    V    |         |         |
14+35       0.9352      1.55  |     Q   |     V   |         |         |
14+40       0.9461      1.58  |     Q   |     V   |         |         |
14+45       0.9572      1.61  |     Q   |     V   |         |         |
14+50       0.9686      1.65  |     Q   |     V   |         |         |
14+55       0.9802      1.69  |     Q   |     V   |         |         |
15+ 0       0.9922      1.73  |     Q   |      V  |         |         |
15+ 5       1.0044      1.78  |      Q  |      V  |         |         |
15+10       1.0170      1.83  |      Q  |      V  |         |         |
15+15       1.0300      1.89  |      Q  |      V  |         |         |
15+20       1.0434      1.95  |      Q  |      V  |         |         |
15+25       1.0573      2.01  |       Q |       V |         |         |
15+30       1.0715      2.06  |       Q |       V |         |         |
15+35       1.0860      2.11  |       Q |       V |         |         |
15+40       1.1009      2.16  |       Q |       V |         |         |
15+45       1.1162      2.22  |       Q |        V|         |         |
15+50       1.1320      2.30  |        Q|        V|         |         |
15+55       1.1488      2.44  |        Q|        V|         |         |
16+ 0       1.1677      2.74  |         Q         V         |         |
```

```
16+ 5       1.1926      3.62  |         |   Q     V         |         |
16+10       1.2259      4.83  |         |        Q|V        |         |
16+15       1.2680      6.11  |         |         |V  Q     |         |
16+20       1.3180      7.27  |         |         | V      Q|         |
16+25       1.3736      8.07  |         |         |  V      | Q       |
16+30       1.4297      8.14  |         |         |   V     | Q       |
16+35       1.4802      7.33  |         |         |    V   Q|         |
16+40       1.5216      6.01  |         |         |   Q V   |         |
16+45       1.5562      5.02  |         |         Q     V   |         |
16+50       1.5861      4.35  |         |      Q  |      V  |         |
16+55       1.6125      3.83  |         |    Q    |      V  |         |
17+ 0       1.6366      3.49  |         |  Q      |       V |         |
17+ 5       1.6591      3.27  |         |  Q      |       V |         |
17+10       1.6801      3.05  |         | Q       |       V |         |
17+15       1.6998      2.86  |         |Q        |        V|         |
17+20       1.7186      2.72  |         Q         |        V|         |
17+25       1.7363      2.58  |         Q         |        V|         |
17+30       1.7531      2.43  |        Q|         |         V         |
17+35       1.7690      2.31  |        Q|         |         V         |
17+40       1.7842      2.21  |       Q |         |         V         |
17+45       1.7990      2.14  |       Q |         |         V         |
17+50       1.8131      2.05  |       Q |         |         |V        |
17+55       1.8264      1.94  |      Q  |         |         |V        |
18+ 0       1.8394      1.88  |      Q  |         |         |V        |
18+ 5       1.8518      1.81  |      Q  |         |         |V        |
18+10       1.8637      1.72  |     Q   |         |         | V       |
18+15       1.8752      1.68  |     Q   |         |         | V       |
18+20       1.8865      1.64  |     Q   |         |         | V       |
18+25       1.8974      1.59  |     Q   |         |         | V       |
18+30       1.9081      1.55  |     Q   |         |         | V       |
18+35       1.9184      1.50  |    Q    |         |         | V       |
18+40       1.9283      1.43  |    Q    |         |         |  V      |
18+45       1.9379      1.40  |    Q    |         |         |  V      |
18+50       1.9473      1.36  |    Q    |         |         |  V      |
18+55       1.9564      1.32  |    Q    |         |         |  V      |
19+ 0       1.9653      1.29  |    Q    |         |         |  V      |
19+ 5       1.9739      1.26  |    Q    |         |         |  V      |
19+10       1.9823      1.22  |   Q     |         |         |   V     |
19+15       1.9905      1.19  |   Q     |         |         |   V     |
19+20       1.9985      1.16  |   Q     |         |         |   V     |
19+25       2.0062      1.12  |   Q     |         |         |   V     |
19+30       2.0138      1.10  |   Q     |         |         |   V     |
19+35       2.0213      1.09  |   Q     |         |         |   V     |
19+40       2.0287      1.07  |   Q     |         |         |   V     |
19+45       2.0360      1.05  |   Q     |         |         |   V     |
19+50       2.0431      1.04  |   Q     |         |         |    V    |
19+55       2.0501      1.02  |   Q     |         |         |    V    |
20+ 0       2.0569      1.00  |  Q      |         |         |    V    |
20+ 5       2.0636      0.96  |  Q      |         |         |    V    |
20+10       2.0697      0.90  |  Q      |         |         |    V    |
20+15       2.0758      0.88  |  Q      |         |         |    V    |
20+20       2.0818      0.87  |  Q      |         |         |    V    |
20+25       2.0877      0.86  |  Q      |         |         |    V    |
20+30       2.0935      0.84  |  Q      |         |         |    V    |
20+35       2.0992      0.83  |  Q      |         |         |     V   |
20+40       2.1049      0.82  |  Q      |         |         |     V   |
20+45       2.1105      0.81  |  Q      |         |         |     V   |
20+50       2.1160      0.80  |  Q      |         |         |     V   |
20+55       2.1215      0.79  |  Q      |         |         |     V   |
```

```
21+ 0       2.1269      0.78  |  Q      |         |         |     V   |
21+ 5       2.1322      0.78  |  Q      |         |         |     V   |
21+10       2.1375      0.77  |  Q      |         |         |     V   |
21+15       2.1427      0.76  |  Q      |         |         |     V   |
21+20       2.1479      0.75  |  Q      |         |         |     V   |
21+25       2.1530      0.74  | Q       |         |         |     V   |
21+30       2.1581      0.74  | Q       |         |         |      V  |
21+35       2.1631      0.73  | Q       |         |         |      V  |
21+40       2.1681      0.72  | Q       |         |         |      V  |
21+45       2.1731      0.72  | Q       |         |         |      V  |
21+50       2.1780      0.71  | Q       |         |         |      V  |
21+55       2.1828      0.70  | Q       |         |         |      V  |
22+ 0       2.1876      0.70  | Q       |         |         |      V  |
22+ 5       2.1924      0.69  | Q       |         |         |      V  |
22+10       2.1971      0.69  | Q       |         |         |      V  |
22+15       2.2018      0.68  | Q       |         |         |      V  |
22+20       2.2064      0.68  | Q       |         |         |      V  |
22+25       2.2111      0.67  | Q       |         |         |      V  |
22+30       2.2156      0.67  | Q       |         |         |       V |
22+35       2.2202      0.66  | Q       |         |         |       V |
22+40       2.2247      0.66  | Q       |         |         |       V |
22+45       2.2292      0.65  | Q       |         |         |       V |
22+50       2.2336      0.65  | Q       |         |         |       V |
22+55       2.2380      0.64  | Q       |         |         |       V |
23+ 0       2.2424      0.64  | Q       |         |         |       V |
23+ 5       2.2468      0.63  | Q       |         |         |       V |
23+10       2.2511      0.63  | Q       |         |         |       V |
23+15       2.2554      0.62  | Q       |         |         |       V |
23+20       2.2597      0.62  | Q       |         |         |       V |
23+25       2.2639      0.62  | Q       |         |         |       V |
23+30       2.2681      0.61  | Q       |         |         |       V |
23+35       2.2723      0.61  | Q       |         |         |        V|
23+40       2.2765      0.60  | Q       |         |         |        V|
23+45       2.2806      0.60  | Q       |         |         |        V|
23+50       2.2847      0.60  | Q       |         |         |        V|
23+55       2.2888      0.59  | Q       |         |         |        V|
24+ 0       2.2929      0.59  | Q       |         |         |        V|
24+ 5       2.2969      0.58  | Q       |         |         |        V|
24+10       2.3007      0.55  | Q       |         |         |        V|
24+15       2.3042      0.52  | Q       |         |         |        V|
24+20       2.3074      0.46  |Q        |         |         |        V|
24+25       2.3101      0.40  |Q        |         |         |        V|
24+30       2.3124      0.33  |Q        |         |         |        V|
24+35       2.3143      0.27  |Q        |         |         |        V|
24+40       2.3158      0.23  Q         |         |         |        V|
24+45       2.3172      0.20  Q         |         |         |        V|
24+50       2.3184      0.17  Q         |         |         |        V|
24+55       2.3194      0.15  Q         |         |         |        V|
25+ 0       2.3204      0.14  Q         |         |         |        V|
25+ 5       2.3212      0.13  Q         |         |         |        V|
25+10       2.3220      0.11  Q         |         |         |        V|
25+15       2.3227      0.10  Q         |         |         |        V|
25+20       2.3234      0.09  Q         |         |         |        V|
25+25       2.3240      0.09  Q         |         |         |        V|
25+30       2.3245      0.08  Q         |         |         |        V|
25+35       2.3250      0.07  Q         |         |         |        V|
25+40       2.3254      0.07  Q         |         |         |        V|
25+45       2.3259      0.06  Q         |         |         |        V|
25+50       2.3262      0.05  Q         |         |         |        V|
```

25+55	2.3266	0.05	Q				V
26+ 0	2.3269	0.05	Q				V
26+ 5	2.3272	0.04	Q				V
26+10	2.3274	0.04	Q				V
26+15	2.3277	0.04	Q				V
26+20	2.3279	0.03	Q				V
26+25	2.3281	0.03	Q				V
26+30	2.3283	0.03	Q				V
26+35	2.3285	0.02	Q				V
26+40	2.3286	0.02	Q				V
26+45	2.3287	0.02	Q				V
26+50	2.3289	0.02	Q				V
26+55	2.3290	0.02	Q				V
27+ 0	2.3291	0.01	Q				V
27+ 5	2.3291	0.01	Q				V
27+10	2.3292	0.01	Q				V
27+15	2.3293	0.01	Q				V
27+20	2.3293	0.01	Q				V
27+25	2.3294	0.01	Q				V
27+30	2.3294	0.01	Q				V
27+35	2.3295	0.01	Q				V
27+40	2.3295	0.00	Q				V
27+45	2.3295	0.00	Q				V
27+50	2.3295	0.00	Q				V
27+55	2.3296	0.00	Q				V
28+ 0	2.3296	0.00	Q				V

```
     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  03/13/23

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


Program License Serial Number 6279

---------------------------------------------------------------------
265.24 EUCLID AVE
PRE-PROJECT - AREA A5
100-YEAR 24-HOUR UNIT HYDROGRAPH

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

      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
           2.71             1           1.20
--------------------------------------------------------------------
Rainfall data for year 100
           2.71             6           3.00
--------------------------------------------------------------------
Rainfall data for year 100
           2.71            24           6.00
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** 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)
 76.0      76.0          2.71      1.000     0.437    1.000    0.437

Area-averaged adjusted loss rate Fm (In/Hr) =  0.437
```

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     2.71   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.400 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       2.71(Ac.)
Catchment Lag time =   0.320 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 26.0417
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       2.71(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval           'S' Graph          Unit Hydrograph
Number             Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        32.77 (CFS))

  1                 2.415                   0.792
  2                10.637                   2.695
  3                25.290                   4.802
  4                43.561                   5.988
  5                58.487                   4.892
  6                67.532                   2.964
  7                73.250                   1.874
  8                77.269                   1.317
  9                80.529                   1.068
 10                83.215                   0.880
 11                85.522                   0.756
 12                87.427                   0.624
 13                89.031                   0.526
 14                90.528                   0.491
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15	91.715	0.389
16	92.796	0.355
17	93.650	0.280
18	94.470	0.269
19	95.253	0.257
20	95.968	0.234
21	96.545	0.189
22	97.077	0.175
23	97.547	0.154
24	97.968	0.138
25	98.332	0.119
26	98.641	0.101
27	98.901	0.085
28	99.161	0.085
29	99.422	0.085
30	99.682	0.085
31	100.000	0.043

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6891	0.1032
4	0.7732	0.0840
5	0.8454	0.0722
6	0.9093	0.0640
7	0.9671	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1155	0.0460
11	1.1588	0.0433
12	1.1998	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3449	0.0466
16	1.3901	0.0451
17	1.4338	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289

40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179

99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141

158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120

217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107

276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066

42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084

101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143

160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0207
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0403	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0640	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4441	0.0364	0.4077
194	0.0840	0.0364	0.0477
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0174
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115

219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063

278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

Total soil rain loss = 2.43(In)
Total effective rainfall = 3.57(In)
Peak flow rate in flood hydrograph = 3.80(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0002	0.02	Q				
0+15	0.0005	0.05	Q				
0+20	0.0011	0.08	Q				
0+25	0.0019	0.11	Q				
0+30	0.0028	0.13	Q				
0+35	0.0037	0.14	Q				
0+40	0.0048	0.15	Q				
0+45	0.0059	0.16	Q				
0+50	0.0070	0.16	Q				
0+55	0.0081	0.17	Q				
1+ 0	0.0093	0.17	Q				
1+ 5	0.0105	0.17	Q				
1+10	0.0117	0.18	Q				
1+15	0.0130	0.18	Q				
1+20	0.0143	0.18	Q				
1+25	0.0155	0.19	Q				
1+30	0.0168	0.19	Q				
1+35	0.0181	0.19	Q				
1+40	0.0195	0.19	Q				
1+45	0.0208	0.19	QV				
1+50	0.0221	0.20	QV				
1+55	0.0235	0.20	QV				
2+ 0	0.0248	0.20	QV				
2+ 5	0.0262	0.20	QV				
2+10	0.0276	0.20	QV				
2+15	0.0290	0.20	QV				
2+20	0.0304	0.20	QV				
2+25	0.0318	0.20	QV				
2+30	0.0332	0.20	QV				
2+35	0.0346	0.21	QV				
2+40	0.0360	0.21	QV				
2+45	0.0374	0.21	QV				

2+50	0.0389	0.21	QV
2+55	0.0403	0.21	Q V
3+ 0	0.0417	0.21	Q V
3+ 5	0.0432	0.21	Q V
3+10	0.0446	0.21	Q V
3+15	0.0461	0.21	Q V
3+20	0.0475	0.21	Q V
3+25	0.0490	0.21	Q V
3+30	0.0505	0.21	Q V
3+35	0.0519	0.21	Q V
3+40	0.0534	0.21	Q V
3+45	0.0549	0.21	Q V
3+50	0.0564	0.22	Q V
3+55	0.0579	0.22	Q V
4+ 0	0.0594	0.22	Q V
4+ 5	0.0609	0.22	Q V
4+10	0.0624	0.22	Q V
4+15	0.0639	0.22	Q V
4+20	0.0654	0.22	Q V
4+25	0.0669	0.22	Q V
4+30	0.0684	0.22	Q V
4+35	0.0700	0.22	Q V
4+40	0.0715	0.22	Q V
4+45	0.0730	0.22	Q V
4+50	0.0746	0.22	Q V
4+55	0.0761	0.23	Q V
5+ 0	0.0777	0.23	Q V
5+ 5	0.0792	0.23	Q V
5+10	0.0808	0.23	Q V
5+15	0.0824	0.23	Q V
5+20	0.0840	0.23	Q V
5+25	0.0856	0.23	Q V
5+30	0.0871	0.23	Q V
5+35	0.0887	0.23	Q V
5+40	0.0903	0.23	Q V
5+45	0.0920	0.23	Q V
5+50	0.0936	0.23	Q V
5+55	0.0952	0.24	Q V
6+ 0	0.0968	0.24	Q V
6+ 5	0.0985	0.24	Q V
6+10	0.1001	0.24	Q V
6+15	0.1018	0.24	Q V
6+20	0.1034	0.24	Q V
6+25	0.1051	0.24	Q V
6+30	0.1067	0.24	Q V
6+35	0.1084	0.24	Q V
6+40	0.1101	0.24	Q V
6+45	0.1118	0.25	Q V
6+50	0.1135	0.25	Q V
6+55	0.1152	0.25	Q V
7+ 0	0.1169	0.25	Q V
7+ 5	0.1186	0.25	Q V
7+10	0.1204	0.25	Q V
7+15	0.1221	0.25	Q V
7+20	0.1238	0.25	Q V
7+25	0.1256	0.25	Q V
7+30	0.1273	0.26	Q V
7+35	0.1291	0.26	Q V
7+40	0.1309	0.26	Q V

7+45	0.1327	0.26	Q V
7+50	0.1345	0.26	Q V
7+55	0.1363	0.26	Q V
8+ 0	0.1381	0.26	Q V
8+ 5	0.1399	0.26	Q V
8+10	0.1417	0.27	Q V
8+15	0.1436	0.27	Q V
8+20	0.1454	0.27	Q V
8+25	0.1473	0.27	Q V
8+30	0.1491	0.27	Q V
8+35	0.1510	0.27	Q V
8+40	0.1529	0.27	Q V
8+45	0.1548	0.28	Q V
8+50	0.1567	0.28	Q V
8+55	0.1586	0.28	Q V
9+ 0	0.1605	0.28	Q V
9+ 5	0.1625	0.28	Q V
9+10	0.1644	0.28	Q V
9+15	0.1664	0.28	Q V
9+20	0.1684	0.29	Q V
9+25	0.1703	0.29	Q V
9+30	0.1723	0.29	Q V
9+35	0.1743	0.29	Q V
9+40	0.1764	0.29	Q V
9+45	0.1784	0.29	Q V
9+50	0.1804	0.30	Q V
9+55	0.1825	0.30	Q V
10+ 0	0.1846	0.30	Q V
10+ 5	0.1867	0.30	Q V
10+10	0.1888	0.30	Q V
10+15	0.1909	0.31	Q V
10+20	0.1930	0.31	Q V
10+25	0.1951	0.31	Q V
10+30	0.1973	0.31	Q V
10+35	0.1995	0.32	Q V
10+40	0.2016	0.32	Q V
10+45	0.2038	0.32	Q V
10+50	0.2061	0.32	Q V
10+55	0.2083	0.32	Q V
11+ 0	0.2105	0.33	Q V
11+ 5	0.2128	0.33	Q V
11+10	0.2151	0.33	Q V
11+15	0.2174	0.33	Q V
11+20	0.2197	0.34	Q V
11+25	0.2221	0.34	Q V
11+30	0.2244	0.34	Q V
11+35	0.2268	0.35	Q V
11+40	0.2292	0.35	Q V
11+45	0.2316	0.35	Q V
11+50	0.2341	0.35	Q V
11+55	0.2365	0.36	Q V
12+ 0	0.2390	0.36	Q V
12+ 5	0.2415	0.36	Q V
12+10	0.2441	0.37	Q V
12+15	0.2466	0.37	Q V
12+20	0.2493	0.38	Q V
12+25	0.2519	0.38	Q V
12+30	0.2546	0.39	Q V
12+35	0.2573	0.39	Q V

12+40	0.2600	0.40	Q	V		
12+45	0.2628	0.40	Q	V		
12+50	0.2656	0.41	Q	V		
12+55	0.2685	0.41	Q	V		
13+ 0	0.2713	0.42	Q	V		
13+ 5	0.2742	0.42	Q	V		
13+10	0.2772	0.43	Q	V		
13+15	0.2802	0.43	Q	V		
13+20	0.2832	0.44	Q	V		
13+25	0.2863	0.44	Q	V		
13+30	0.2894	0.45	Q	V		
13+35	0.2925	0.46	Q	V		
13+40	0.2957	0.46	Q	V		
13+45	0.2989	0.47	Q	V		
13+50	0.3022	0.48	Q	V		
13+55	0.3056	0.49	Q	V		
14+ 0	0.3090	0.49	Q	V		
14+ 5	0.3124	0.50	Q	V		
14+10	0.3160	0.51	Q	V		
14+15	0.3196	0.52	Q	V		
14+20	0.3232	0.53	Q	V		
14+25	0.3269	0.54	Q	V		
14+30	0.3307	0.55	Q	V		
14+35	0.3346	0.56	Q	V		
14+40	0.3386	0.58	Q	V		
14+45	0.3427	0.59	Q	V		
14+50	0.3468	0.61	Q	V		
14+55	0.3511	0.62	Q	V		
15+ 0	0.3555	0.64	Q	V		
15+ 5	0.3600	0.66	Q	V		
15+10	0.3647	0.68	Q	V		
15+15	0.3696	0.70	Q	V		
15+20	0.3746	0.73	Q	V		
15+25	0.3798	0.75	Q	V		
15+30	0.3851	0.77	Q	V		
15+35	0.3904	0.78	Q	V		
15+40	0.3958	0.79	Q	V		
15+45	0.4014	0.81	Q	V		
15+50	0.4074	0.87	Q		V	
15+55	0.4140	0.96	Q		V	
16+ 0	0.4219	1.14	Q		V	
16+ 5	0.4335	1.69	Q		V	
16+10	0.4515	2.61	Q		V	
16+15	0.4754	3.47		Q	V	
16+20	0.5015	3.80		Q	V	
16+25	0.5237	3.21		Q	V	
16+30	0.5399	2.35	Q		V	
16+35	0.5525	1.83	Q		V	
16+40	0.5631	1.55	Q		V	
16+45	0.5727	1.39	Q		V	
16+50	0.5813	1.26	Q		V	
16+55	0.5893	1.16	Q		V	
17+ 0	0.5966	1.06	Q		V	
17+ 5	0.6033	0.98	Q		V	
17+10	0.6097	0.92	Q			V
17+15	0.6155	0.85	Q			V
17+20	0.6211	0.81	Q			V
17+25	0.6263	0.75	Q			V
17+30	0.6312	0.72	Q			V

17+35	0.6360	0.69	Q			V
17+40	0.6406	0.66	Q			V
17+45	0.6449	0.62	Q			V
17+50	0.6490	0.60	Q			V
17+55	0.6530	0.57	Q			V
18+ 0	0.6568	0.55	Q			V
18+ 5	0.6604	0.53	Q			V
18+10	0.6639	0.51	Q			V
18+15	0.6672	0.49	Q			V
18+20	0.6705	0.47	Q			V
18+25	0.6737	0.46	Q			V
18+30	0.6767	0.44	Q			V
18+35	0.6796	0.41	Q			V
18+40	0.6822	0.39	Q			V
18+45	0.6848	0.38	Q			V
18+50	0.6874	0.37	Q			V
18+55	0.6899	0.36	Q			V
19+ 0	0.6923	0.36	Q			V
19+ 5	0.6947	0.35	Q			V
19+10	0.6971	0.34	Q			V
19+15	0.6994	0.34	Q			V
19+20	0.7017	0.33	Q			V
19+25	0.7039	0.33	Q			V
19+30	0.7061	0.32	Q			V
19+35	0.7083	0.32	Q			V
19+40	0.7105	0.31	Q			V
19+45	0.7126	0.31	Q			V
19+50	0.7147	0.30	Q			V
19+55	0.7167	0.30	Q			V
20+ 0	0.7187	0.29	Q			V
20+ 5	0.7207	0.29	Q			V
20+10	0.7227	0.29	Q			V
20+15	0.7247	0.28	Q			V
20+20	0.7266	0.28	Q			V
20+25	0.7285	0.28	Q			V
20+30	0.7304	0.27	Q			V
20+35	0.7323	0.27	Q			V
20+40	0.7342	0.27	Q			V
20+45	0.7360	0.27	Q			V
20+50	0.7378	0.26	Q			V
20+55	0.7396	0.26	Q			V
21+ 0	0.7414	0.26	Q			V
21+ 5	0.7431	0.26	Q			V
21+10	0.7449	0.25	Q			V
21+15	0.7466	0.25	Q			V
21+20	0.7483	0.25	Q			V
21+25	0.7500	0.25	Q			V
21+30	0.7517	0.24	Q			V
21+35	0.7534	0.24	Q			V
21+40	0.7551	0.24	Q			V
21+45	0.7567	0.24	Q			V
21+50	0.7583	0.24	Q			V
21+55	0.7600	0.24	Q			V
22+ 0	0.7616	0.23	Q			V
22+ 5	0.7632	0.23	Q			V
22+10	0.7647	0.23	Q			V
22+15	0.7663	0.23	Q			V
22+20	0.7679	0.23	Q			V
22+25	0.7694	0.22	Q			V

22+30	0.7709	0.22	Q				V
22+35	0.7725	0.22	Q				V
22+40	0.7740	0.22	Q				V
22+45	0.7755	0.22	Q				V
22+50	0.7770	0.22	Q				V
22+55	0.7785	0.22	Q				V
23+ 0	0.7799	0.21	Q				V
23+ 5	0.7814	0.21	Q				V
23+10	0.7829	0.21	Q				V
23+15	0.7843	0.21	Q				V
23+20	0.7858	0.21	Q				V
23+25	0.7872	0.21	Q				V
23+30	0.7886	0.21	Q				V
23+35	0.7900	0.21	Q				V
23+40	0.7914	0.20	Q				V
23+45	0.7928	0.20	Q				V
23+50	0.7942	0.20	Q				V
23+55	0.7956	0.20	Q				V
24+ 0	0.7970	0.20	Q				V
24+ 5	0.7983	0.19	Q				V
24+10	0.7995	0.18	Q				V
24+15	0.8005	0.15	Q				V
24+20	0.8013	0.11	Q				V
24+25	0.8019	0.08	Q				V
24+30	0.8023	0.06	Q				V
24+35	0.8027	0.05	Q				V
24+40	0.8030	0.05	Q				V
24+45	0.8032	0.04	Q				V
24+50	0.8035	0.03	Q				V
24+55	0.8037	0.03	Q				V
25+ 0	0.8038	0.02	Q				V
25+ 5	0.8040	0.02	Q				V
25+10	0.8041	0.02	Q				V
25+15	0.8042	0.02	Q				V
25+20	0.8043	0.01	Q				V
25+25	0.8044	0.01	Q				V
25+30	0.8045	0.01	Q				V
25+35	0.8045	0.01	Q				V
25+40	0.8046	0.01	Q				V
25+45	0.8046	0.01	Q				V
25+50	0.8047	0.01	Q				V
25+55	0.8047	0.00	Q				V
26+ 0	0.8047	0.00	Q				V
26+ 5	0.8047	0.00	Q				V
26+10	0.8048	0.00	Q				V
26+15	0.8048	0.00	Q				V
26+20	0.8048	0.00	Q				V
26+25	0.8048	0.00	Q				V
26+30	0.8048	0.00	Q				V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA A6
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
5.22	1	1.20
Rainfall data for year 100		
5.22	6	3.00
Rainfall data for year 100		
5.22	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	5.22	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)            Yield Fr
     5.22   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.486 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       5.22(Ac.)
Catchment Lag time =   0.389 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 21.4335
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       5.22(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval           'S' Graph          Unit Hydrograph
Number             Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        63.13 (CFS))

  1                 1.922                   1.213
  2                 7.754                   3.682
  3                17.975                   6.453
  4                32.067                   8.896
  5                47.213                   9.562
  6                58.888                   7.371
  7                66.464                   4.783
  8                71.686                   3.297
  9                75.357                   2.317
 10                78.401                   1.922
 11                80.952                   1.610
 12                83.134                   1.377
 13                85.072                   1.223
 14                86.733                   1.049
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15	88.147	0.893
16	89.433	0.812
17	90.642	0.763
18	91.604	0.607
19	92.532	0.586
20	93.274	0.469
21	93.960	0.433
22	94.625	0.419
23	95.268	0.406
24	95.872	0.381
25	96.353	0.304
26	96.819	0.295
27	97.224	0.255
28	97.610	0.244
29	97.952	0.216
30	98.252	0.189
31	98.533	0.177
32	98.752	0.138
33	98.966	0.135
34	99.180	0.135
35	99.395	0.135
36	99.609	0.135
37	99.823	0.135
38	100.000	0.112

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1153	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2981	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8165	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9171	0.0330
31	1.9496	0.0324
32	1.9815	0.0319

33	2.0129	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186

92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4820	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7080	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145

151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122

210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108

269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064

35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081

94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130

153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0252	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138

212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065

```
   271              0.0115          0.0050            0.0065
   272              0.0115          0.0050            0.0065
   273              0.0114          0.0050            0.0064
   274              0.0113          0.0049            0.0064
   275              0.0113          0.0049            0.0063
   276              0.0112          0.0049            0.0063
   277              0.0111          0.0049            0.0063
   278              0.0111          0.0048            0.0062
   279              0.0110          0.0048            0.0062
   280              0.0109          0.0048            0.0062
   281              0.0109          0.0047            0.0061
   282              0.0108          0.0047            0.0061
   283              0.0107          0.0047            0.0061
   284              0.0107          0.0047            0.0060
   285              0.0106          0.0046            0.0060
   286              0.0106          0.0046            0.0060
   287              0.0105          0.0046            0.0059
   288              0.0105          0.0046            0.0059
   --------------------------------------------------------------------
   --------------------------------------------------------------------
   Total soil rain loss =      2.43(In)
   Total effective rainfall =      3.57(In)
   Peak flow rate in flood hydrograph =      6.34(CFS)
   ---------------------------------------------------------------------
   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       24 - H O U R   S T O R M
                  R u n o f f    H y d r o g r a p h
   --------------------------------------------------------------------
               Hydrograph in   5   Minute intervals ((CFS))

   --------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0000      0.01  Q         |         |         |         |
  0+10       0.0002      0.03  Q         |         |         |         |
  0+15       0.0007      0.07  Q         |         |         |         |
  0+20       0.0015      0.12  Q         |         |         |         |
  0+25       0.0027      0.18  Q         |         |         |         |
  0+30       0.0042      0.22  Q         |         |         |         |
  0+35       0.0060      0.25  Q         |         |         |         |
  0+40       0.0078      0.27  VQ        |         |         |         |
  0+45       0.0097      0.28  VQ        |         |         |         |
  0+50       0.0118      0.29  VQ        |         |         |         |
  0+55       0.0139      0.30  VQ        |         |         |         |
  1+ 0       0.0160      0.31  VQ        |         |         |         |
  1+ 5       0.0182      0.32  VQ        |         |         |         |
  1+10       0.0205      0.33  VQ        |         |         |         |
  1+15       0.0228      0.33  VQ        |         |         |         |
  1+20       0.0252      0.34  VQ        |         |         |         |
  1+25       0.0275      0.35  VQ        |         |         |         |
  1+30       0.0299      0.35  VQ        |         |         |         |
  1+35       0.0324      0.35  VQ        |         |         |         |
  1+40       0.0349      0.36  VQ        |         |         |         |
  1+45       0.0374      0.36  VQ        |         |         |         |
  1+50       0.0399      0.37  |Q        |         |         |         |
  1+55       0.0424      0.37  |Q        |         |         |         |
  2+ 0       0.0450      0.37  |Q        |         |         |         |
  2+ 5       0.0476      0.38  |Q        |         |         |         |
  2+10       0.0502      0.38  |Q        |         |         |         |
```

2+15	0.0528	0.38	Q				
2+20	0.0554	0.38	Q				
2+25	0.0581	0.39	Q				
2+30	0.0607	0.39	Q				
2+35	0.0634	0.39	Q				
2+40	0.0661	0.39	Q				
2+45	0.0688	0.39	Q				
2+50	0.0716	0.40	Q				
2+55	0.0743	0.40	Q				
3+ 0	0.0771	0.40	Q				
3+ 5	0.0798	0.40	QV				
3+10	0.0826	0.40	QV				
3+15	0.0854	0.40	QV				
3+20	0.0882	0.41	QV				
3+25	0.0910	0.41	QV				
3+30	0.0938	0.41	QV				
3+35	0.0966	0.41	QV				
3+40	0.0995	0.41	QV				
3+45	0.1023	0.41	QV				
3+50	0.1052	0.41	QV				
3+55	0.1080	0.42	QV				
4+ 0	0.1109	0.42	QV				
4+ 5	0.1138	0.42	QV				
4+10	0.1167	0.42	Q V				
4+15	0.1196	0.42	Q V				
4+20	0.1225	0.42	Q V				
4+25	0.1254	0.42	Q V				
4+30	0.1283	0.43	Q V				
4+35	0.1313	0.43	Q V				
4+40	0.1342	0.43	Q V				
4+45	0.1372	0.43	Q V				
4+50	0.1401	0.43	Q V				
4+55	0.1431	0.43	Q V				
5+ 0	0.1461	0.43	Q V				
5+ 5	0.1491	0.44	Q V				
5+10	0.1521	0.44	Q V				
5+15	0.1552	0.44	Q V				
5+20	0.1582	0.44	Q V				
5+25	0.1612	0.44	Q V				
5+30	0.1643	0.44	Q V				
5+35	0.1674	0.45	Q V				
5+40	0.1705	0.45	Q V				
5+45	0.1735	0.45	Q V				
5+50	0.1767	0.45	Q V				
5+55	0.1798	0.45	Q V				
6+ 0	0.1829	0.45	Q V				
6+ 5	0.1860	0.46	Q V				
6+10	0.1892	0.46	Q V				
6+15	0.1924	0.46	Q V				
6+20	0.1955	0.46	Q V				
6+25	0.1987	0.46	Q V				
6+30	0.2019	0.47	Q V				
6+35	0.2052	0.47	Q V				
6+40	0.2084	0.47	Q V				
6+45	0.2116	0.47	Q V				
6+50	0.2149	0.47	Q V				
6+55	0.2182	0.48	Q V				
7+ 0	0.2215	0.48	Q V				
7+ 5	0.2248	0.48	Q V				

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  7+10     0.2281     0.48  |Q   V    |         |         |         |
  7+15     0.2314     0.48  |Q   V    |         |         |         |
  7+20     0.2348     0.49  |Q    V   |         |         |         |
  7+25     0.2381     0.49  |Q    V   |         |         |         |
  7+30     0.2415     0.49  |Q    V   |         |         |         |
  7+35     0.2449     0.49  |Q    V   |         |         |         |
  7+40     0.2483     0.49  |Q    V   |         |         |         |
  7+45     0.2517     0.50  |Q    V   |         |         |         |
  7+50     0.2552     0.50  |Q    V   |         |         |         |
  7+55     0.2586     0.50  | Q   V   |         |         |         |
  8+ 0     0.2621     0.50  | Q   V   |         |         |         |
  8+ 5     0.2656     0.51  | Q   V   |         |         |         |
  8+10     0.2691     0.51  | Q   V   |         |         |         |
  8+15     0.2726     0.51  | Q    V  |         |         |         |
  8+20     0.2762     0.51  | Q    V  |         |         |         |
  8+25     0.2797     0.52  | Q    V  |         |         |         |
  8+30     0.2833     0.52  | Q    V  |         |         |         |
  8+35     0.2869     0.52  | Q    V  |         |         |         |
  8+40     0.2905     0.53  | Q    V  |         |         |         |
  8+45     0.2941     0.53  | Q    V  |         |         |         |
  8+50     0.2978     0.53  | Q    V  |         |         |         |
  8+55     0.3015     0.53  | Q    V  |         |         |         |
  9+ 0     0.3052     0.54  | Q    V  |         |         |         |
  9+ 5     0.3089     0.54  | Q    V  |         |         |         |
  9+10     0.3126     0.54  | Q     V |         |         |         |
  9+15     0.3164     0.55  | Q     V |         |         |         |
  9+20     0.3202     0.55  | Q     V |         |         |         |
  9+25     0.3240     0.55  | Q     V |         |         |         |
  9+30     0.3278     0.56  | Q     V |         |         |         |
  9+35     0.3316     0.56  | Q     V |         |         |         |
  9+40     0.3355     0.56  | Q     V |         |         |         |
  9+45     0.3394     0.57  | Q     V |         |         |         |
  9+50     0.3433     0.57  | Q     V |         |         |         |
  9+55     0.3472     0.57  | Q     V |         |         |         |
 10+ 0     0.3512     0.58  | Q      V|         |         |         |
 10+ 5     0.3552     0.58  | Q      V|         |         |         |
 10+10     0.3592     0.58  | Q      V|         |         |         |
 10+15     0.3633     0.59  | Q      V|         |         |         |
 10+20     0.3673     0.59  | Q      V|         |         |         |
 10+25     0.3714     0.59  | Q      V|         |         |         |
 10+30     0.3756     0.60  | Q      V|         |         |         |
 10+35     0.3797     0.60  | Q      V|         |         |         |
 10+40     0.3839     0.61  | Q      V|         |         |         |
 10+45     0.3881     0.61  | Q      V|         |         |         |
 10+50     0.3923     0.62  | Q       V         |         |         |
 10+55     0.3966     0.62  | Q       V         |         |         |
 11+ 0     0.4009     0.63  | Q       V         |         |         |
 11+ 5     0.4053     0.63  | Q       V         |         |         |
 11+10     0.4096     0.63  | Q       V         |         |         |
 11+15     0.4140     0.64  | Q       V         |         |         |
 11+20     0.4185     0.64  | Q       V         |         |         |
 11+25     0.4229     0.65  | Q       V         |         |         |
 11+30     0.4275     0.66  | Q       |V        |         |         |
 11+35     0.4320     0.66  | Q       |V        |         |         |
 11+40     0.4366     0.67  | Q       |V        |         |         |
 11+45     0.4412     0.67  | Q       |V        |         |         |
 11+50     0.4459     0.68  | Q       |V        |         |         |
 11+55     0.4506     0.68  | Q       |V        |         |         |
 12+ 0     0.4554     0.69  | Q       |V        |         |         |
```

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12+ 5       0.4601      0.70   | Q       |V        |         |         |
12+10       0.4650      0.70   | Q       |V        |         |         |
12+15       0.4699      0.71   | Q       | V       |         |         |
12+20       0.4749      0.72   | Q       | V       |         |         |
12+25       0.4799      0.73   | Q       | V       |         |         |
12+30       0.4850      0.74   | Q       | V       |         |         |
12+35       0.4902      0.75   | Q       | V       |         |         |
12+40       0.4954      0.76   |  Q      | V       |         |         |
12+45       0.5007      0.77   |  Q      | V       |         |         |
12+50       0.5060      0.78   |  Q      |  V      |         |         |
12+55       0.5114      0.79   |  Q      |  V      |         |         |
13+ 0       0.5169      0.79   |  Q      |  V      |         |         |
13+ 5       0.5225      0.80   |  Q      |  V      |         |         |
13+10       0.5281      0.81   |  Q      |  V      |         |         |
13+15       0.5337      0.82   |  Q      |  V      |         |         |
13+20       0.5395      0.83   |  Q      |  V      |         |         |
13+25       0.5453      0.85   |  Q      |   V     |         |         |
13+30       0.5512      0.86   |  Q      |   V     |         |         |
13+35       0.5572      0.87   |  Q      |   V     |         |         |
13+40       0.5633      0.88   |  Q      |   V     |         |         |
13+45       0.5694      0.89   |  Q      |   V     |         |         |
13+50       0.5757      0.91   |  Q      |   V     |         |         |
13+55       0.5820      0.92   |  Q      |   V     |         |         |
14+ 0       0.5885      0.94   |  Q      |    V    |         |         |
14+ 5       0.5950      0.95   |  Q      |    V    |         |         |
14+10       0.6017      0.97   |  Q      |    V    |         |         |
14+15       0.6085      0.99   |  Q      |    V    |         |         |
14+20       0.6154      1.00   |   Q     |    V    |         |         |
14+25       0.6225      1.02   |   Q     |     V   |         |         |
14+30       0.6297      1.04   |   Q     |     V   |         |         |
14+35       0.6370      1.07   |   Q     |     V   |         |         |
14+40       0.6445      1.09   |   Q     |     V   |         |         |
14+45       0.6522      1.11   |   Q     |     V   |         |         |
14+50       0.6600      1.14   |   Q     |     V   |         |         |
14+55       0.6681      1.17   |   Q     |      V  |         |         |
15+ 0       0.6763      1.20   |   Q     |      V  |         |         |
15+ 5       0.6849      1.24   |   Q     |      V  |         |         |
15+10       0.6936      1.27   |    Q    |      V  |         |         |
15+15       0.7027      1.31   |    Q    |       V |         |         |
15+20       0.7121      1.36   |    Q    |       V |         |         |
15+25       0.7217      1.41   |    Q    |       V |         |         |
15+30       0.7317      1.44   |    Q    |       V |         |         |
15+35       0.7418      1.47   |    Q    |        V|         |         |
15+40       0.7521      1.49   |    Q    |        V|         |         |
15+45       0.7626      1.53   |     Q   |        V|         |         |
15+50       0.7737      1.60   |     Q   |        V|         |         |
15+55       0.7857      1.75   |     Q   |         V         |         |
16+ 0       0.7997      2.03   |       Q |         V         |         |
16+ 5       0.8193      2.84   |         |Q        |V        |         |
16+10       0.8476      4.12   |         |     Q   |V        |         |
16+15       0.8848      5.40   |         |         |QV       |         |
16+20       0.9283      6.32   |         |         |  V Q    |         |
16+25       0.9720      6.34   |         |         |    Q    |         |
16+30       1.0083      5.26   |         |         |Q   V    |         |
16+35       1.0363      4.07   |         |     Q   |     V   |         |
16+40       1.0592      3.33   |         |  Q      |      V  |         |
16+45       1.0787      2.83   |         |Q        |      V  |         |
16+50       1.0964      2.57   |         Q         |       V |         |
16+55       1.1126      2.35   |        Q|         |       V |         |
```

17+ 0	1.1275	2.17
17+ 5	1.1415	2.03
17+10	1.1544	1.88
17+15	1.1666	1.76
17+20	1.1780	1.67
17+25	1.1890	1.59
17+30	1.1992	1.48
17+35	1.2089	1.42
17+40	1.2181	1.34
17+45	1.2270	1.28
17+50	1.2356	1.24
17+55	1.2439	1.20
18+ 0	1.2518	1.16
18+ 5	1.2594	1.10
18+10	1.2668	1.07
18+15	1.2738	1.02
18+20	1.2807	0.99
18+25	1.2872	0.95
18+30	1.2936	0.92
18+35	1.2997	0.89
18+40	1.3056	0.86
18+45	1.3114	0.84
18+50	1.3170	0.82
18+55	1.3225	0.80
19+ 0	1.3280	0.79
19+ 5	1.3332	0.77
19+10	1.3383	0.73
19+15	1.3430	0.68
19+20	1.3475	0.66
19+25	1.3520	0.65
19+30	1.3564	0.64
19+35	1.3607	0.63
19+40	1.3650	0.62
19+45	1.3692	0.61
19+50	1.3733	0.60
19+55	1.3774	0.59
20+ 0	1.3814	0.58
20+ 5	1.3854	0.58
20+10	1.3893	0.57
20+15	1.3931	0.56
20+20	1.3970	0.55
20+25	1.4007	0.55
20+30	1.4044	0.54
20+35	1.4081	0.53
20+40	1.4118	0.53
20+45	1.4154	0.52
20+50	1.4189	0.52
20+55	1.4225	0.51
21+ 0	1.4260	0.51
21+ 5	1.4294	0.50
21+10	1.4328	0.50
21+15	1.4362	0.49
21+20	1.4396	0.49
21+25	1.4429	0.48
21+30	1.4462	0.48
21+35	1.4495	0.47
21+40	1.4527	0.47
21+45	1.4559	0.47
21+50	1.4591	0.46

```
 21+55       1.4623      0.46  |Q         |         |         |     V   |
 22+ 0       1.4654      0.46  |Q         |         |         |     V   |
 22+ 5       1.4685      0.45  |Q         |         |         |     V   |
 22+10       1.4716      0.45  |Q         |         |         |     V   |
 22+15       1.4747      0.44  |Q         |         |         |     V   |
 22+20       1.4777      0.44  |Q         |         |         |      V  |
 22+25       1.4808      0.44  |Q         |         |         |      V  |
 22+30       1.4837      0.44  |Q         |         |         |      V  |
 22+35       1.4867      0.43  |Q         |         |         |      V  |
 22+40       1.4897      0.43  |Q         |         |         |      V  |
 22+45       1.4926      0.43  |Q         |         |         |      V  |
 22+50       1.4955      0.42  |Q         |         |         |      V  |
 22+55       1.4984      0.42  |Q         |         |         |      V  |
 23+ 0       1.5013      0.42  |Q         |         |         |      V  |
 23+ 5       1.5042      0.41  |Q         |         |         |      V  |
 23+10       1.5070      0.41  |Q         |         |         |      V  |
 23+15       1.5098      0.41  |Q         |         |         |      V  |
 23+20       1.5126      0.41  |Q         |         |         |      V  |
 23+25       1.5154      0.40  |Q         |         |         |        V|
 23+30       1.5182      0.40  |Q         |         |         |        V|
 23+35       1.5209      0.40  |Q         |         |         |        V|
 23+40       1.5236      0.40  |Q         |         |         |        V|
 23+45       1.5264      0.39  |Q         |         |         |        V|
 23+50       1.5291      0.39  |Q         |         |         |        V|
 23+55       1.5317      0.39  |Q         |         |         |        V|
 24+ 0       1.5344      0.39  |Q         |         |         |        V|
 24+ 5       1.5370      0.38  |Q         |         |         |        V|
 24+10       1.5395      0.35  |Q         |         |         |        V|
 24+15       1.5416      0.31  |Q         |         |         |        V|
 24+20       1.5434      0.26  |Q         |         |         |        V|
 24+25       1.5448      0.20  Q          |         |         |        V|
 24+30       1.5459      0.16  Q          |         |         |        V|
 24+35       1.5468      0.13  Q          |         |         |        V|
 24+40       1.5476      0.11  Q          |         |         |        V|
 24+45       1.5482      0.10  Q          |         |         |        V|
 24+50       1.5488      0.08  Q          |         |         |        V|
 24+55       1.5493      0.07  Q          |         |         |        V|
 25+ 0       1.5498      0.07  Q          |         |         |        V|
 25+ 5       1.5502      0.06  Q          |         |         |        V|
 25+10       1.5505      0.05  Q          |         |         |        V|
 25+15       1.5508      0.05  Q          |         |         |        V|
 25+20       1.5511      0.04  Q          |         |         |        V|
 25+25       1.5514      0.04  Q          |         |         |        V|
 25+30       1.5516      0.03  Q          |         |         |        V|
 25+35       1.5518      0.03  Q          |         |         |        V|
 25+40       1.5520      0.03  Q          |         |         |        V|
 25+45       1.5521      0.02  Q          |         |         |        V|
 25+50       1.5523      0.02  Q          |         |         |        V|
 25+55       1.5524      0.02  Q          |         |         |        V|
 26+ 0       1.5525      0.02  Q          |         |         |        V|
 26+ 5       1.5526      0.01  Q          |         |         |        V|
 26+10       1.5527      0.01  Q          |         |         |        V|
 26+15       1.5528      0.01  Q          |         |         |        V|
 26+20       1.5528      0.01  Q          |         |         |        V|
 26+25       1.5529      0.01  Q          |         |         |        V|
 26+30       1.5529      0.01  Q          |         |         |        V|
 26+35       1.5530      0.01  Q          |         |         |        V|
 26+40       1.5530      0.00  Q          |         |         |        V|
 26+45       1.5530      0.00  Q          |         |         |        V|
```

```
  26+50       1.5530      0.00  Q          |         |         |        V|
  26+55       1.5531      0.00  Q          |         |         |        V|
  27+ 0       1.5531      0.00  Q          |         |         |        V|
  27+ 5       1.5531      0.00  Q          |         |         |        V|
-----------------------------------------------------------------------
```

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 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT AREA A7
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
2.25	1	1.20
Rainfall data for year 100		
2.25	6	3.00
Rainfall data for year 100		
2.25	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	2.25	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     2.25   1.000          76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.362 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       2.25(Ac.)
Catchment Lag time =   0.290 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 28.7753
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       2.25(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
            (K =       27.21 (CFS))

  1                2.743                   0.747
  2               12.594                   2.680
  3               29.966                   4.727
  4               49.748                   5.383
  5               63.270                   3.680
  6               71.129                   2.139
  7               76.079                   1.347
  8               79.888                   1.037
  9               82.942                   0.831
 10               85.511                   0.699
 11               87.597                   0.568
 12               89.355                   0.478
 13               90.920                   0.426
 14               92.191                   0.346
```

15	93.252	0.289
16	94.169	0.250
17	95.044	0.238
18	95.862	0.223
19	96.512	0.177
20	97.099	0.160
21	97.617	0.141
22	98.061	0.121
23	98.454	0.107
24	98.762	0.084
25	99.050	0.078
26	99.338	0.078
27	99.625	0.078
28	100.000	0.039

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6891	0.1032
4	0.7732	0.0840
5	0.8454	0.0722
6	0.9093	0.0640
7	0.9672	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1155	0.0460
11	1.1588	0.0433
12	1.1999	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3449	0.0466
16	1.3901	0.0451
17	1.4339	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279

43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5150	0.0253
52	2.5401	0.0251
53	2.5649	0.0249
54	2.5896	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6622	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8020	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176

102	3.5707	0.0175
103	3.5882	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8406	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2131	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140

161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137
169	4.5962	0.0136
170	4.6098	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6771	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120

220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4199	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5902	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8737	0.0107
277	5.8843	0.0106
278	5.8949	0.0106

279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9687	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067

45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086

104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149

163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0207
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0403	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0640	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4441	0.0364	0.4077
194	0.0840	0.0364	0.0477
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0174
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108

222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062

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281             0.0109          0.0047            0.0061
282             0.0108          0.0047            0.0061
283             0.0107          0.0047            0.0061
284             0.0107          0.0047            0.0060
285             0.0106          0.0046            0.0060
286             0.0106          0.0046            0.0060
287             0.0105          0.0046            0.0059
288             0.0105          0.0046            0.0059
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      3.28(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   24 - H O U R   S T O R M
              R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0002      0.02  Q          |         |         |         |
  0+15       0.0005      0.05  Q          |         |         |         |
  0+20       0.0010      0.08  Q          |         |         |         |
  0+25       0.0017      0.10  Q          |         |         |         |
  0+30       0.0025      0.11  Q          |         |         |         |
  0+35       0.0034      0.12  Q          |         |         |         |
  0+40       0.0043      0.13  Q          |         |         |         |
  0+45       0.0052      0.13  Q          |         |         |         |
  0+50       0.0061      0.14  Q          |         |         |         |
  0+55       0.0071      0.14  Q          |         |         |         |
  1+ 0       0.0081      0.15  Q          |         |         |         |
  1+ 5       0.0091      0.15  Q          |         |         |         |
  1+10       0.0102      0.15  Q          |         |         |         |
  1+15       0.0112      0.15  Q          |         |         |         |
  1+20       0.0123      0.15  Q          |         |         |         |
  1+25       0.0134      0.16  Q          |         |         |         |
  1+30       0.0145      0.16  Q          |         |         |         |
  1+35       0.0156      0.16  Q          |         |         |         |
  1+40       0.0167      0.16  Q          |         |         |         |
  1+45       0.0178      0.16  QV         |         |         |         |
  1+50       0.0189      0.16  QV         |         |         |         |
  1+55       0.0201      0.16  QV         |         |         |         |
  2+ 0       0.0212      0.17  QV         |         |         |         |
  2+ 5       0.0224      0.17  QV         |         |         |         |
  2+10       0.0235      0.17  QV         |         |         |         |
  2+15       0.0247      0.17  QV         |         |         |         |
  2+20       0.0258      0.17  QV         |         |         |         |
  2+25       0.0270      0.17  QV         |         |         |         |
  2+30       0.0282      0.17  QV         |         |         |         |
  2+35       0.0294      0.17  QV         |         |         |         |
  2+40       0.0305      0.17  QV         |         |         |         |
  2+45       0.0317      0.17  QV         |         |         |         |
  2+50       0.0329      0.17  QV         |         |         |         |
  2+55       0.0341      0.17  Q V        |         |         |         |
  3+ 0       0.0353      0.17  Q V        |         |         |         |
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3+ 5	0.0365	0.17	Q V				
3+10	0.0377	0.17	Q V				
3+15	0.0389	0.18	Q V				
3+20	0.0401	0.18	Q V				
3+25	0.0413	0.18	Q V				
3+30	0.0425	0.18	Q V				
3+35	0.0438	0.18	Q V				
3+40	0.0450	0.18	Q V				
3+45	0.0462	0.18	Q V				
3+50	0.0475	0.18	Q V				
3+55	0.0487	0.18	Q V				
4+ 0	0.0499	0.18	Q V				
4+ 5	0.0512	0.18	Q V				
4+10	0.0524	0.18	Q V				
4+15	0.0537	0.18	Q V				
4+20	0.0549	0.18	Q V				
4+25	0.0562	0.18	Q V				
4+30	0.0575	0.18	Q V				
4+35	0.0587	0.18	Q V				
4+40	0.0600	0.19	Q V				
4+45	0.0613	0.19	Q V				
4+50	0.0626	0.19	Q V				
4+55	0.0639	0.19	Q V				
5+ 0	0.0652	0.19	Q V				
5+ 5	0.0665	0.19	Q V				
5+10	0.0678	0.19	Q V				
5+15	0.0691	0.19	Q V				
5+20	0.0704	0.19	Q V				
5+25	0.0717	0.19	Q V				
5+30	0.0730	0.19	Q V				
5+35	0.0744	0.19	Q V				
5+40	0.0757	0.19	Q V				
5+45	0.0770	0.19	Q V				
5+50	0.0784	0.20	Q V				
5+55	0.0797	0.20	Q V				
6+ 0	0.0811	0.20	Q V				
6+ 5	0.0825	0.20	Q V				
6+10	0.0838	0.20	Q V				
6+15	0.0852	0.20	Q V				
6+20	0.0866	0.20	Q V				
6+25	0.0880	0.20	Q V				
6+30	0.0893	0.20	Q V				
6+35	0.0907	0.20	Q V				
6+40	0.0921	0.20	Q V				
6+45	0.0935	0.20	Q V				
6+50	0.0950	0.21	Q V				
6+55	0.0964	0.21	Q V				
7+ 0	0.0978	0.21	Q V				
7+ 5	0.0992	0.21	Q V				
7+10	0.1007	0.21	Q V				
7+15	0.1021	0.21	Q V				
7+20	0.1036	0.21	Q V				
7+25	0.1050	0.21	Q V				
7+30	0.1065	0.21	Q V				
7+35	0.1080	0.21	Q V				
7+40	0.1094	0.21	Q V				
7+45	0.1109	0.22	Q V				
7+50	0.1124	0.22	Q V				
7+55	0.1139	0.22	Q V				

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  8+ 0     0.1154     0.22  Q     V   |         |         |         |
  8+ 5     0.1169     0.22  Q      V  |         |         |         |
  8+10     0.1184     0.22  Q      V  |         |         |         |
  8+15     0.1200     0.22  Q      V  |         |         |         |
  8+20     0.1215     0.22  Q      V  |         |         |         |
  8+25     0.1231     0.22  Q      V  |         |         |         |
  8+30     0.1246     0.23  Q      V  |         |         |         |
  8+35     0.1262     0.23  Q      V  |         |         |         |
  8+40     0.1277     0.23  Q      V  |         |         |         |
  8+45     0.1293     0.23  Q      V  |         |         |         |
  8+50     0.1309     0.23  Q      V  |         |         |         |
  8+55     0.1325     0.23  Q      V  |         |         |         |
  9+ 0     0.1341     0.23  Q       V |         |         |         |
  9+ 5     0.1357     0.23  Q       V |         |         |         |
  9+10     0.1373     0.24  Q       V |         |         |         |
  9+15     0.1390     0.24  Q       V |         |         |         |
  9+20     0.1406     0.24  Q       V |         |         |         |
  9+25     0.1423     0.24  Q       V |         |         |         |
  9+30     0.1439     0.24  Q       V |         |         |         |
  9+35     0.1456     0.24  Q       V |         |         |         |
  9+40     0.1473     0.24  Q       V |         |         |         |
  9+45     0.1490     0.25  Q       V |         |         |         |
  9+50     0.1507     0.25  Q        V|         |         |         |
  9+55     0.1524     0.25  Q        V|         |         |         |
 10+ 0     0.1541     0.25  |Q       V|         |         |         |
 10+ 5     0.1558     0.25  |Q       V|         |         |         |
 10+10     0.1576     0.25  |Q       V|         |         |         |
 10+15     0.1593     0.26  |Q       V|         |         |         |
 10+20     0.1611     0.26  |Q       V|         |         |         |
 10+25     0.1629     0.26  |Q       V|         |         |         |
 10+30     0.1647     0.26  |Q       V|         |         |         |
 10+35     0.1665     0.26  |Q       V|         |         |         |
 10+40     0.1683     0.26  |Q        V         |         |         |
 10+45     0.1701     0.27  |Q        V         |         |         |
 10+50     0.1720     0.27  |Q        V         |         |         |
 10+55     0.1739     0.27  |Q        V         |         |         |
 11+ 0     0.1757     0.27  |Q        V         |         |         |
 11+ 5     0.1776     0.27  |Q        V         |         |         |
 11+10     0.1795     0.28  |Q        V         |         |         |
 11+15     0.1814     0.28  |Q        V         |         |         |
 11+20     0.1834     0.28  |Q        V         |         |         |
 11+25     0.1853     0.28  |Q        |V        |         |         |
 11+30     0.1873     0.29  |Q        |V        |         |         |
 11+35     0.1893     0.29  |Q        |V        |         |         |
 11+40     0.1913     0.29  |Q        |V        |         |         |
 11+45     0.1933     0.29  |Q        |V        |         |         |
 11+50     0.1953     0.30  |Q        |V        |         |         |
 11+55     0.1974     0.30  |Q        |V        |         |         |
 12+ 0     0.1995     0.30  |Q        |V        |         |         |
 12+ 5     0.2016     0.30  |Q        | V       |         |         |
 12+10     0.2037     0.31  |Q        | V       |         |         |
 12+15     0.2058     0.31  |Q        | V       |         |         |
 12+20     0.2080     0.32  |Q        | V       |         |         |
 12+25     0.2102     0.32  |Q        | V       |         |         |
 12+30     0.2125     0.32  |Q        | V       |         |         |
 12+35     0.2147     0.33  |Q        | V       |         |         |
 12+40     0.2170     0.33  |Q        | V       |         |         |
 12+45     0.2193     0.34  |Q        |  V      |         |         |
 12+50     0.2217     0.34  |Q        |  V      |         |         |
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12+55       0.2240      0.34  |Q        |  V      |         |         |
13+ 0       0.2264      0.35  |Q        |  V      |         |         |
13+ 5       0.2289      0.35  |Q        |  V      |         |         |
13+10       0.2313      0.36  |Q        |  V      |         |         |
13+15       0.2338      0.36  |Q        |   V     |         |         |
13+20       0.2363      0.37  |Q        |   V     |         |         |
13+25       0.2389      0.37  |Q        |   V     |         |         |
13+30       0.2415      0.38  |Q        |   V     |         |         |
13+35       0.2441      0.38  |Q        |   V     |         |         |
13+40       0.2468      0.39  |Q        |   V     |         |         |
13+45       0.2495      0.39  |Q        |   V     |         |         |
13+50       0.2523      0.40  |Q        |    V    |         |         |
13+55       0.2551      0.41  |Q        |    V    |         |         |
14+ 0       0.2579      0.41  |Q        |    V    |         |         |
14+ 5       0.2608      0.42  |Q        |    V    |         |         |
14+10       0.2637      0.43  |Q        |    V    |         |         |
14+15       0.2667      0.44  |Q        |    V    |         |         |
14+20       0.2698      0.44  |Q        |     V   |         |         |
14+25       0.2729      0.45  |Q        |     V   |         |         |
14+30       0.2761      0.46  |Q        |     V   |         |         |
14+35       0.2794      0.47  |Q        |     V   |         |         |
14+40       0.2827      0.48  |Q        |     V   |         |         |
14+45       0.2861      0.50  |Q        |      V  |         |         |
14+50       0.2896      0.51  | Q       |      V  |         |         |
14+55       0.2932      0.52  | Q       |      V  |         |         |
15+ 0       0.2969      0.54  | Q       |      V  |         |         |
15+ 5       0.3007      0.55  | Q       |       V |         |         |
15+10       0.3046      0.57  | Q       |       V |         |         |
15+15       0.3087      0.59  | Q       |       V |         |         |
15+20       0.3129      0.61  | Q       |       V |         |         |
15+25       0.3173      0.63  | Q       |        V|         |         |
15+30       0.3218      0.65  | Q       |        V|         |         |
15+35       0.3263      0.65  | Q       |        V|         |         |
15+40       0.3308      0.66  | Q       |        V|         |         |
15+45       0.3355      0.68  | Q       |         V         |         |
15+50       0.3406      0.73  | Q       |         V         |         |
15+55       0.3462      0.82  |  Q      |         V         |         |
16+ 0       0.3531      0.99  |  Q      |         |V        |         |
16+ 5       0.3634      1.50  |     Q   |         |V        |         |
16+10       0.3800      2.41  |        Q|         | V       |         |
16+15       0.4019      3.19  |         | Q       |   V     |         |
16+20       0.4246      3.28  |         |  Q      |    V    |         |
16+25       0.4418      2.50  |         Q         |     V   |         |
16+30       0.4542      1.81  |      Q  |         |      V  |         |
16+35       0.4641      1.43  |    Q    |         |      V  |         |
16+40       0.4727      1.25  |   Q     |         |       V |         |
16+45       0.4804      1.12  |   Q     |         |       V |         |
16+50       0.4874      1.02  |   Q     |         |        V|         |
16+55       0.4937      0.92  |  Q      |         |        V|         |
17+ 0       0.4996      0.85  |  Q      |         |        V|         |
17+ 5       0.5050      0.79  |  Q      |         |         V         |
17+10       0.5101      0.73  | Q       |         |         V         |
17+15       0.5147      0.68  | Q       |         |         V         |
17+20       0.5192      0.64  | Q       |         |         |V        |
17+25       0.5234      0.61  | Q       |         |         |V        |
17+30       0.5274      0.59  | Q       |         |         |V        |
17+35       0.5312      0.55  | Q       |         |         |V        |
17+40       0.5348      0.52  | Q       |         |         | V       |
17+45       0.5382      0.50  |Q        |         |         | V       |
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17+50	0.5415	0.48	Q			V
17+55	0.5447	0.46	Q			V
18+ 0	0.5477	0.44	Q			V
18+ 5	0.5506	0.42	Q			V
18+10	0.5534	0.41	Q			V
18+15	0.5561	0.39	Q			V
18+20	0.5586	0.36	Q			V
18+25	0.5609	0.34	Q			V
18+30	0.5632	0.33	Q			V
18+35	0.5654	0.32	Q			V
18+40	0.5676	0.31	Q			V
18+45	0.5697	0.31	Q			V
18+50	0.5718	0.30	Q			V
18+55	0.5738	0.30	Q			V
19+ 0	0.5758	0.29	Q			V
19+ 5	0.5778	0.28	Q			V
19+10	0.5797	0.28	Q			V
19+15	0.5816	0.28	Q			V
19+20	0.5835	0.27	Q			V
19+25	0.5853	0.27	Q			V
19+30	0.5871	0.26	Q			V
19+35	0.5889	0.26	Q			V
19+40	0.5907	0.26	Q			V
19+45	0.5924	0.25	Q			V
19+50	0.5941	0.25	Q			V
19+55	0.5958	0.25	Q			V
20+ 0	0.5975	0.24	Q			V
20+ 5	0.5991	0.24	Q			V
20+10	0.6008	0.24	Q			V
20+15	0.6024	0.23	Q			V
20+20	0.6040	0.23	Q			V
20+25	0.6055	0.23	Q			V
20+30	0.6071	0.23	Q			V
20+35	0.6086	0.22	Q			V
20+40	0.6102	0.22	Q			V
20+45	0.6117	0.22	Q			V
20+50	0.6132	0.22	Q			V
20+55	0.6147	0.22	Q			V
21+ 0	0.6161	0.21	Q			V
21+ 5	0.6176	0.21	Q			V
21+10	0.6190	0.21	Q			V
21+15	0.6205	0.21	Q			V
21+20	0.6219	0.21	Q			V
21+25	0.6233	0.20	Q			V
21+30	0.6247	0.20	Q			V
21+35	0.6260	0.20	Q			V
21+40	0.6274	0.20	Q			V
21+45	0.6288	0.20	Q			V
21+50	0.6301	0.20	Q			V
21+55	0.6315	0.19	Q			V
22+ 0	0.6328	0.19	Q			V
22+ 5	0.6341	0.19	Q			V
22+10	0.6354	0.19	Q			V
22+15	0.6367	0.19	Q			V
22+20	0.6380	0.19	Q			V
22+25	0.6393	0.19	Q			V
22+30	0.6405	0.18	Q			V
22+35	0.6418	0.18	Q			V
22+40	0.6431	0.18	Q			V

22+45	0.6443	0.18	Q				V
22+50	0.6455	0.18	Q				V
22+55	0.6468	0.18	Q				V
23+ 0	0.6480	0.18	Q				V
23+ 5	0.6492	0.18	Q				V
23+10	0.6504	0.17	Q				V
23+15	0.6516	0.17	Q				V
23+20	0.6528	0.17	Q				V
23+25	0.6540	0.17	Q				V
23+30	0.6551	0.17	Q				V
23+35	0.6563	0.17	Q				V
23+40	0.6575	0.17	Q				V
23+45	0.6586	0.17	Q				V
23+50	0.6598	0.17	Q				V
23+55	0.6609	0.17	Q				V
24+ 0	0.6620	0.16	Q				V
24+ 5	0.6631	0.16	Q				V
24+10	0.6641	0.14	Q				V
24+15	0.6649	0.11	Q				V
24+20	0.6655	0.08	Q				V
24+25	0.6659	0.06	Q				V
24+30	0.6662	0.05	Q				V
24+35	0.6665	0.04	Q				V
24+40	0.6667	0.03	Q				V
24+45	0.6669	0.03	Q				V
24+50	0.6671	0.02	Q				V
24+55	0.6672	0.02	Q				V
25+ 0	0.6673	0.02	Q				V
25+ 5	0.6674	0.01	Q				V
25+10	0.6675	0.01	Q				V
25+15	0.6676	0.01	Q				V
25+20	0.6676	0.01	Q				V
25+25	0.6677	0.01	Q				V
25+30	0.6677	0.01	Q				V
25+35	0.6678	0.01	Q				V
25+40	0.6678	0.00	Q				V
25+45	0.6678	0.00	Q				V
25+50	0.6679	0.00	Q				V
25+55	0.6679	0.00	Q				V
26+ 0	0.6679	0.00	Q				V
26+ 5	0.6679	0.00	Q				V
26+10	0.6679	0.00	Q				V
26+15	0.6679	0.00	Q				V

APPENDIX B.3: UNIT HYDROGRAPH ANALYSIS, AREAS "B"

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA B1
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.26	1	1.20
Rainfall data for year 100		
4.26	6	3.00
Rainfall data for year 100		
4.26	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	4.26	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     4.26   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.352 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       4.26(Ac.)
Catchment Lag time =   0.282 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 29.5928
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       4.26(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        51.52 (CFS))

  1                2.847                   1.467
  2               13.216                   5.342
  3               31.390                   9.363
  4               51.449                  10.334
  5               64.493                   6.720
  6               72.033                   3.884
  7               76.844                   2.479
  8               80.587                   1.928
  9               83.600                   1.552
 10               86.121                   1.299
 11               88.140                   1.040
 12               89.912                   0.913
 13               91.376                   0.754
 14               92.637                   0.649
```

15	93.631	0.512
16	94.559	0.478
17	95.447	0.457
18	96.193	0.384
19	96.834	0.330
20	97.387	0.285
21	97.889	0.258
22	98.307	0.216
23	98.658	0.181
24	98.954	0.152
25	99.250	0.152
26	99.546	0.152
27	99.842	0.152
28	100.000	0.081

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9671	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1154	0.0460
11	1.1587	0.0433
12	1.1998	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3900	0.0451
17	1.4338	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7104	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279

43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4120	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176

102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140

161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120

220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106

279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067

45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086

104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149

163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4077
194	0.0840	0.0364	0.0476
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108

222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062

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 281              0.0109           0.0047              0.0061
 282              0.0108           0.0047              0.0061
 283              0.0107           0.0047              0.0061
 284              0.0107           0.0047              0.0060
 285              0.0106           0.0046              0.0060
 286              0.0106           0.0046              0.0060
 287              0.0105           0.0046              0.0059
 288              0.0105           0.0046              0.0059
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      6.26(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0003      0.04  Q         |         |         |         |
  0+15       0.0010      0.10  Q         |         |         |         |
  0+20       0.0021      0.16  Q         |         |         |         |
  0+25       0.0034      0.20  Q         |         |         |         |
  0+30       0.0049      0.22  Q         |         |         |         |
  0+35       0.0065      0.23  Q         |         |         |         |
  0+40       0.0082      0.25  Q         |         |         |         |
  0+45       0.0100      0.26  VQ        |         |         |         |
  0+50       0.0118      0.26  VQ        |         |         |         |
  0+55       0.0137      0.27  VQ        |         |         |         |
  1+ 0       0.0156      0.28  VQ        |         |         |         |
  1+ 5       0.0175      0.28  VQ        |         |         |         |
  1+10       0.0195      0.29  VQ        |         |         |         |
  1+15       0.0215      0.29  VQ        |         |         |         |
  1+20       0.0235      0.29  VQ        |         |         |         |
  1+25       0.0256      0.30  VQ        |         |         |         |
  1+30       0.0277      0.30  VQ        |         |         |         |
  1+35       0.0298      0.30  VQ        |         |         |         |
  1+40       0.0319      0.31  |Q        |         |         |         |
  1+45       0.0340      0.31  |Q        |         |         |         |
  1+50       0.0361      0.31  |Q        |         |         |         |
  1+55       0.0383      0.31  |Q        |         |         |         |
  2+ 0       0.0405      0.31  |Q        |         |         |         |
  2+ 5       0.0426      0.32  |Q        |         |         |         |
  2+10       0.0448      0.32  |Q        |         |         |         |
  2+15       0.0470      0.32  |Q        |         |         |         |
  2+20       0.0492      0.32  |Q        |         |         |         |
  2+25       0.0515      0.32  |Q        |         |         |         |
  2+30       0.0537      0.32  |Q        |         |         |         |
  2+35       0.0559      0.32  |Q        |         |         |         |
  2+40       0.0582      0.33  |Q        |         |         |         |
  2+45       0.0604      0.33  |Q        |         |         |         |
  2+50       0.0627      0.33  |Q        |         |         |         |
  2+55       0.0649      0.33  |QV       |         |         |         |
  3+ 0       0.0672      0.33  |QV       |         |         |         |
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3+ 5	0.0695	0.33	QV			
3+10	0.0718	0.33	QV			
3+15	0.0740	0.33	QV			
3+20	0.0763	0.33	QV			
3+25	0.0786	0.33	QV			
3+30	0.0810	0.34	QV			
3+35	0.0833	0.34	QV			
3+40	0.0856	0.34	QV			
3+45	0.0879	0.34	QV			
3+50	0.0903	0.34	QV			
3+55	0.0926	0.34	QV			
4+ 0	0.0950	0.34	QV			
4+ 5	0.0974	0.34	Q V			
4+10	0.0997	0.34	Q V			
4+15	0.1021	0.35	Q V			
4+20	0.1045	0.35	Q V			
4+25	0.1069	0.35	Q V			
4+30	0.1093	0.35	Q V			
4+35	0.1117	0.35	Q V			
4+40	0.1141	0.35	Q V			
4+45	0.1166	0.35	Q V			
4+50	0.1190	0.35	Q V			
4+55	0.1215	0.36	Q V			
5+ 0	0.1239	0.36	Q V			
5+ 5	0.1264	0.36	Q V			
5+10	0.1289	0.36	Q V			
5+15	0.1313	0.36	Q V			
5+20	0.1338	0.36	Q V			
5+25	0.1363	0.36	Q V			
5+30	0.1389	0.36	Q V			
5+35	0.1414	0.37	Q V			
5+40	0.1439	0.37	Q V			
5+45	0.1464	0.37	Q V			
5+50	0.1490	0.37	Q V			
5+55	0.1516	0.37	Q V			
6+ 0	0.1541	0.37	Q V			
6+ 5	0.1567	0.38	Q V			
6+10	0.1593	0.38	Q V			
6+15	0.1619	0.38	Q V			
6+20	0.1645	0.38	Q V			
6+25	0.1672	0.38	Q V			
6+30	0.1698	0.38	Q V			
6+35	0.1724	0.38	Q V			
6+40	0.1751	0.39	Q V			
6+45	0.1778	0.39	Q V			
6+50	0.1804	0.39	Q V			
6+55	0.1831	0.39	Q V			
7+ 0	0.1858	0.39	Q V			
7+ 5	0.1886	0.39	Q V			
7+10	0.1913	0.40	Q V			
7+15	0.1940	0.40	Q V			
7+20	0.1968	0.40	Q V			
7+25	0.1996	0.40	Q V			
7+30	0.2023	0.40	Q V			
7+35	0.2051	0.41	Q V			
7+40	0.2079	0.41	Q V			
7+45	0.2107	0.41	Q V			
7+50	0.2136	0.41	Q V			
7+55	0.2164	0.41	Q V			

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  8+ 0     0.2193     0.42  |Q    V   |         |         |         |
  8+ 5     0.2222     0.42  |Q     V  |         |         |         |
  8+10     0.2250     0.42  |Q     V  |         |         |         |
  8+15     0.2280     0.42  |Q     V  |         |         |         |
  8+20     0.2309     0.42  |Q     V  |         |         |         |
  8+25     0.2338     0.43  |Q     V  |         |         |         |
  8+30     0.2368     0.43  |Q     V  |         |         |         |
  8+35     0.2397     0.43  |Q     V  |         |         |         |
  8+40     0.2427     0.43  |Q     V  |         |         |         |
  8+45     0.2457     0.43  |Q     V  |         |         |         |
  8+50     0.2487     0.44  |Q     V  |         |         |         |
  8+55     0.2517     0.44  |Q     V  |         |         |         |
  9+ 0     0.2548     0.44  |Q      V |         |         |         |
  9+ 5     0.2578     0.44  |Q      V |         |         |         |
  9+10     0.2609     0.45  |Q      V |         |         |         |
  9+15     0.2640     0.45  |Q      V |         |         |         |
  9+20     0.2671     0.45  |Q      V |         |         |         |
  9+25     0.2703     0.46  |Q      V |         |         |         |
  9+30     0.2734     0.46  |Q      V |         |         |         |
  9+35     0.2766     0.46  |Q      V |         |         |         |
  9+40     0.2798     0.46  |Q      V |         |         |         |
  9+45     0.2830     0.47  |Q      V |         |         |         |
  9+50     0.2862     0.47  |Q       V|         |         |         |
  9+55     0.2895     0.47  |Q       V|         |         |         |
 10+ 0     0.2928     0.48  |Q       V|         |         |         |
 10+ 5     0.2960     0.48  |Q       V|         |         |         |
 10+10     0.2994     0.48  |Q       V|         |         |         |
 10+15     0.3027     0.48  |Q       V|         |         |         |
 10+20     0.3061     0.49  |Q       V|         |         |         |
 10+25     0.3094     0.49  |Q       V|         |         |         |
 10+30     0.3129     0.49  |Q       V|         |         |         |
 10+35     0.3163     0.50  |Q       V|         |         |         |
 10+40     0.3197     0.50  | Q       V         |         |         |
 10+45     0.3232     0.51  | Q       V         |         |         |
 10+50     0.3267     0.51  | Q       V         |         |         |
 10+55     0.3303     0.51  | Q       V         |         |         |
 11+ 0     0.3338     0.52  | Q       V         |         |         |
 11+ 5     0.3374     0.52  | Q       V         |         |         |
 11+10     0.3410     0.52  | Q       V         |         |         |
 11+15     0.3447     0.53  | Q       V         |         |         |
 11+20     0.3483     0.53  | Q       V         |         |         |
 11+25     0.3520     0.54  | Q       |V        |         |         |
 11+30     0.3558     0.54  | Q       |V        |         |         |
 11+35     0.3595     0.55  | Q       |V        |         |         |
 11+40     0.3633     0.55  | Q       |V        |         |         |
 11+45     0.3672     0.56  | Q       |V        |         |         |
 11+50     0.3710     0.56  | Q       |V        |         |         |
 11+55     0.3749     0.57  | Q       |V        |         |         |
 12+ 0     0.3789     0.57  | Q       |V        |         |         |
 12+ 5     0.3829     0.58  | Q       | V       |         |         |
 12+10     0.3869     0.58  | Q       | V       |         |         |
 12+15     0.3910     0.59  | Q       | V       |         |         |
 12+20     0.3951     0.60  | Q       | V       |         |         |
 12+25     0.3993     0.61  | Q       | V       |         |         |
 12+30     0.4036     0.62  | Q       | V       |         |         |
 12+35     0.4079     0.62  | Q       | V       |         |         |
 12+40     0.4122     0.63  | Q       |  V      |         |         |
 12+45     0.4166     0.64  | Q       |  V      |         |         |
 12+50     0.4211     0.65  | Q       |  V      |         |         |
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12+55      0.4256      0.65  | Q       |  V      |         |         |
13+ 0      0.4301      0.66  | Q       |  V      |         |         |
13+ 5      0.4348      0.67  | Q       |  V      |         |         |
13+10      0.4394      0.68  | Q       |  V      |         |         |
13+15      0.4442      0.69  | Q       |   V     |         |         |
13+20      0.4490      0.70  | Q       |   V     |         |         |
13+25      0.4538      0.71  | Q       |   V     |         |         |
13+30      0.4588      0.72  | Q       |   V     |         |         |
13+35      0.4638      0.73  | Q       |   V     |         |         |
13+40      0.4688      0.74  | Q       |   V     |         |         |
13+45      0.4740      0.75  | Q       |   V     |         |         |
13+50      0.4792      0.76  |  Q      |    V    |         |         |
13+55      0.4845      0.77  |  Q      |    V    |         |         |
14+ 0      0.4899      0.78  |  Q      |    V    |         |         |
14+ 5      0.4954      0.80  |  Q      |    V    |         |         |
14+10      0.5010      0.81  |  Q      |    V    |         |         |
14+15      0.5067      0.83  |  Q      |    V    |         |         |
14+20      0.5126      0.84  |  Q      |     V   |         |         |
14+25      0.5185      0.86  |  Q      |     V   |         |         |
14+30      0.5245      0.88  |  Q      |     V   |         |         |
14+35      0.5307      0.90  |  Q      |     V   |         |         |
14+40      0.5371      0.92  |  Q      |     V   |         |         |
14+45      0.5436      0.94  |  Q      |      V  |         |         |
14+50      0.5502      0.97  |  Q      |      V  |         |         |
14+55      0.5570      0.99  |  Q      |      V  |         |         |
15+ 0      0.5641      1.02  |   Q     |      V  |         |         |
15+ 5      0.5713      1.05  |   Q     |       V |         |         |
15+10      0.5788      1.09  |   Q     |       V |         |         |
15+15      0.5866      1.13  |   Q     |       V |         |         |
15+20      0.5946      1.17  |   Q     |       V |         |         |
15+25      0.6029      1.21  |   Q     |        V|         |         |
15+30      0.6114      1.23  |   Q     |        V|         |         |
15+35      0.6199      1.24  |   Q     |        V|         |         |
15+40      0.6285      1.25  |   Q     |        V|         |         |
15+45      0.6375      1.30  |    Q    |         V         |         |
15+50      0.6472      1.40  |    Q    |         V         |         |
15+55      0.6580      1.57  |     Q   |         V         |         |
16+ 0      0.6711      1.91  |      Q  |         |V        |         |
16+ 5      0.6911      2.91  |         |Q        |V        |         |
16+10      0.7235      4.70  |         |       Q | V       |         |
16+15      0.7662      6.20  |         |         |   Q     |         |
16+20      0.8093      6.26  |         |         |    Q    |         |
16+25      0.8412      4.64  |         |       Q |     V   |         |
16+30      0.8643      3.35  |         |  Q      |      V  |         |
16+35      0.8826      2.67  |         Q         |      V  |         |
16+40      0.8988      2.35  |        Q|         |       V |         |
16+45      0.9133      2.10  |       Q |         |       V |         |
16+50      0.9265      1.91  |      Q  |         |        V|         |
16+55      0.9384      1.73  |     Q   |         |        V|         |
17+ 0      0.9494      1.60  |     Q   |         |        V|         |
17+ 5      0.9596      1.48  |    Q    |         |         V         |
17+10      0.9690      1.37  |    Q    |         |         V         |
17+15      0.9778      1.27  |    Q    |         |         V         |
17+20      0.9862      1.21  |   Q     |         |         |V        |
17+25      0.9942      1.16  |   Q     |         |         |V        |
17+30      1.0017      1.09  |   Q     |         |         |V        |
17+35      1.0088      1.03  |   Q     |         |         |V        |
17+40      1.0156      0.98  |  Q      |         |         | V       |
17+45      1.0220      0.94  |  Q      |         |         | V       |
```

17+50	1.0282	0.89	Q			V
17+55	1.0341	0.86	Q			V
18+ 0	1.0397	0.82	Q			V
18+ 5	1.0452	0.80	Q			V
18+10	1.0506	0.77	Q			V
18+15	1.0557	0.74	Q			V
18+20	1.0605	0.69	Q			V
18+25	1.0649	0.64	Q			V
18+30	1.0692	0.62	Q			V
18+35	1.0734	0.61	Q			V
18+40	1.0775	0.60	Q			V
18+45	1.0815	0.58	Q			V
18+50	1.0854	0.57	Q			V
18+55	1.0893	0.56	Q			V
19+ 0	1.0931	0.55	Q			V
19+ 5	1.0968	0.54	Q			V
19+10	1.1004	0.53	Q			V
19+15	1.1040	0.52	Q			V
19+20	1.1076	0.51	Q			V
19+25	1.1111	0.51	Q			V
19+30	1.1145	0.50	Q			V
19+35	1.1179	0.49	Q			V
19+40	1.1212	0.48	Q			V
19+45	1.1245	0.48	Q			V
19+50	1.1278	0.47	Q			V
19+55	1.1310	0.47	Q			V
20+ 0	1.1341	0.46	Q			V
20+ 5	1.1372	0.45	Q			V
20+10	1.1403	0.45	Q			V
20+15	1.1434	0.44	Q			V
20+20	1.1464	0.44	Q			V
20+25	1.1494	0.43	Q			V
20+30	1.1524	0.43	Q			V
20+35	1.1553	0.42	Q			V
20+40	1.1582	0.42	Q			V
20+45	1.1610	0.42	Q			V
20+50	1.1639	0.41	Q			V
20+55	1.1667	0.41	Q			V
21+ 0	1.1695	0.40	Q			V
21+ 5	1.1722	0.40	Q			V
21+10	1.1750	0.40	Q			V
21+15	1.1777	0.39	Q			V
21+20	1.1804	0.39	Q			V
21+25	1.1830	0.39	Q			V
21+30	1.1857	0.38	Q			V
21+35	1.1883	0.38	Q			V
21+40	1.1909	0.38	Q			V
21+45	1.1935	0.37	Q			V
21+50	1.1960	0.37	Q			V
21+55	1.1985	0.37	Q			V
22+ 0	1.2011	0.37	Q			V
22+ 5	1.2036	0.36	Q			V
22+10	1.2060	0.36	Q			V
22+15	1.2085	0.36	Q			V
22+20	1.2109	0.35	Q			V
22+25	1.2134	0.35	Q			V
22+30	1.2158	0.35	Q			V
22+35	1.2182	0.35	Q			V
22+40	1.2205	0.34	Q			V

22+45	1.2229	0.34	Q				V
22+50	1.2252	0.34	Q				V
22+55	1.2276	0.34	Q				V
23+ 0	1.2299	0.34	Q				V
23+ 5	1.2322	0.33	Q				V
23+10	1.2345	0.33	Q				V
23+15	1.2367	0.33	Q				V
23+20	1.2390	0.33	Q				V
23+25	1.2412	0.33	Q				V
23+30	1.2434	0.32	Q				V
23+35	1.2457	0.32	Q				V
23+40	1.2479	0.32	Q				V
23+45	1.2501	0.32	Q				V
23+50	1.2522	0.32	Q				V
23+55	1.2544	0.31	Q				V
24+ 0	1.2565	0.31	Q				V
24+ 5	1.2586	0.30	Q				V
24+10	1.2605	0.27	Q				V
24+15	1.2619	0.21	Q				V
24+20	1.2630	0.15	Q				V
24+25	1.2638	0.11	Q				V
24+30	1.2644	0.09	Q				V
24+35	1.2649	0.07	Q				V
24+40	1.2653	0.06	Q				V
24+45	1.2656	0.05	Q				V
24+50	1.2659	0.04	Q				V
24+55	1.2662	0.04	Q				V
25+ 0	1.2664	0.03	Q				V
25+ 5	1.2666	0.03	Q				V
25+10	1.2667	0.02	Q				V
25+15	1.2669	0.02	Q				V
25+20	1.2670	0.02	Q				V
25+25	1.2671	0.01	Q				V
25+30	1.2672	0.01	Q				V
25+35	1.2672	0.01	Q				V
25+40	1.2673	0.01	Q				V
25+45	1.2673	0.01	Q				V
25+50	1.2674	0.01	Q				V
25+55	1.2674	0.00	Q				V
26+ 0	1.2674	0.00	Q				V
26+ 5	1.2674	0.00	Q				V
26+10	1.2674	0.00	Q				V
26+15	1.2675	0.00	Q				V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA B2
100-YEAR 24 HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
1.61	1	1.20
Rainfall data for year 100		
1.61	6	3.00
Rainfall data for year 100		
1.61	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	1.61	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     1.61   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.255 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       1.61(Ac.)
Catchment Lag time =   0.204 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 40.8497
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       1.61(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        19.47 (CFS))

  1                4.496                  0.875
  2               23.057                  3.614
  3               50.245                  5.294
  4               67.271                  3.315
  5               75.562                  1.614
  6               80.862                  1.032
  7               84.839                  0.774
  8               87.853                  0.587
  9               90.272                  0.471
 10               92.165                  0.368
 11               93.625                  0.284
 12               94.893                  0.247
 13               96.024                  0.220
 14               96.909                  0.172
```

15	97.654	0.145
16	98.264	0.119
17	98.740	0.093
18	99.149	0.080
19	99.557	0.080
20	100.000	0.040

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6892	0.1032
4	0.7732	0.0840
5	0.8454	0.0722
6	0.9094	0.0640
7	0.9672	0.0578
8	1.0203	0.0531
9	1.0695	0.0492
10	1.1155	0.0460
11	1.1589	0.0433
12	1.1999	0.0410
13	1.2501	0.0501
14	1.2983	0.0483
15	1.3450	0.0466
16	1.3901	0.0451
17	1.4339	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5582	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7105	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8167	0.0347
28	1.8508	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9497	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1926	0.0289
40	2.2211	0.0286
41	2.2494	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256

51	2.5150	0.0253
52	2.5401	0.0251
53	2.5649	0.0249
54	2.5896	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6622	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8020	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2404	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5532	0.0176
102	3.5707	0.0175
103	3.5882	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170

110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8406	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2131	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3157	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5139	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137

169	4.5962	0.0136
170	4.6098	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6503	0.0135
174	4.6637	0.0134
175	4.6771	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8348	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2082	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117

228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3852	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4199	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5453	0.0113
247	5.5565	0.0113
248	5.5678	0.0112
249	5.5790	0.0112
250	5.5902	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8737	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9687	0.0105
286	5.9791	0.0105

287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068

53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090

112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172

171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0207
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0403	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0640	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4441	0.0364	0.4077
194	0.0840	0.0364	0.0477
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0174
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096

230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

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----------------------------------------------------------------------
----------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      2.96(CFS)
-----------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5      0.0000      0.01  Q         |         |         |         |
  0+10      0.0002      0.03  Q         |         |         |         |
  0+15      0.0006      0.06  Q         |         |         |         |
  0+20      0.0011      0.08  Q         |         |         |         |
  0+25      0.0017      0.09  Q         |         |         |         |
  0+30      0.0024      0.09  Q         |         |         |         |
  0+35      0.0031      0.10  Q         |         |         |         |
  0+40      0.0038      0.10  Q         |         |         |         |
  0+45      0.0045      0.10  Q         |         |         |         |
  0+50      0.0052      0.11  Q         |         |         |         |
  0+55      0.0060      0.11  Q         |         |         |         |
  1+ 0      0.0067      0.11  Q         |         |         |         |
  1+ 5      0.0075      0.11  Q         |         |         |         |
  1+10      0.0083      0.11  Q         |         |         |         |
  1+15      0.0091      0.11  Q         |         |         |         |
  1+20      0.0099      0.12  Q         |         |         |         |
  1+25      0.0107      0.12  Q         |         |         |         |
  1+30      0.0115      0.12  Q         |         |         |         |
  1+35      0.0123      0.12  QV        |         |         |         |
  1+40      0.0131      0.12  QV        |         |         |         |
  1+45      0.0139      0.12  QV        |         |         |         |
  1+50      0.0148      0.12  QV        |         |         |         |
  1+55      0.0156      0.12  QV        |         |         |         |
  2+ 0      0.0164      0.12  QV        |         |         |         |
  2+ 5      0.0173      0.12  QV        |         |         |         |
  2+10      0.0181      0.12  QV        |         |         |         |
  2+15      0.0189      0.12  QV        |         |         |         |
  2+20      0.0198      0.12  QV        |         |         |         |
  2+25      0.0206      0.12  QV        |         |         |         |
  2+30      0.0214      0.12  QV        |         |         |         |
  2+35      0.0223      0.12  QV        |         |         |         |
  2+40      0.0231      0.12  QV        |         |         |         |
  2+45      0.0240      0.12  Q V       |         |         |         |
  2+50      0.0248      0.12  Q V       |         |         |         |
  2+55      0.0257      0.12  Q V       |         |         |         |
  3+ 0      0.0266      0.12  Q V       |         |         |         |
  3+ 5      0.0274      0.13  Q V       |         |         |         |
  3+10      0.0283      0.13  Q V       |         |         |         |
  3+15      0.0292      0.13  Q V       |         |         |         |
  3+20      0.0300      0.13  Q V       |         |         |         |
  3+25      0.0309      0.13  Q V       |         |         |         |
  3+30      0.0318      0.13  Q V       |         |         |         |
  3+35      0.0326      0.13  Q V       |         |         |         |
  3+40      0.0335      0.13  Q V       |         |         |         |
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3+45	0.0344	0.13	Q V			
3+50	0.0353	0.13	Q V			
3+55	0.0362	0.13	Q V			
4+ 0	0.0371	0.13	Q V			
4+ 5	0.0380	0.13	Q V			
4+10	0.0389	0.13	Q V			
4+15	0.0398	0.13	Q V			
4+20	0.0407	0.13	Q V			
4+25	0.0416	0.13	Q V			
4+30	0.0425	0.13	Q V			
4+35	0.0434	0.13	Q V			
4+40	0.0443	0.13	Q V			
4+45	0.0453	0.13	Q V			
4+50	0.0462	0.13	Q V			
4+55	0.0471	0.13	Q V			
5+ 0	0.0480	0.14	Q V			
5+ 5	0.0490	0.14	Q V			
5+10	0.0499	0.14	Q V			
5+15	0.0509	0.14	Q V			
5+20	0.0518	0.14	Q V			
5+25	0.0527	0.14	Q V			
5+30	0.0537	0.14	Q V			
5+35	0.0547	0.14	Q V			
5+40	0.0556	0.14	Q V			
5+45	0.0566	0.14	Q V			
5+50	0.0575	0.14	Q V			
5+55	0.0585	0.14	Q V			
6+ 0	0.0595	0.14	Q V			
6+ 5	0.0605	0.14	Q V			
6+10	0.0615	0.14	Q V			
6+15	0.0624	0.14	Q V			
6+20	0.0634	0.14	Q V			
6+25	0.0644	0.14	Q V			
6+30	0.0654	0.15	Q V			
6+35	0.0664	0.15	Q V			
6+40	0.0674	0.15	Q V			
6+45	0.0685	0.15	Q V			
6+50	0.0695	0.15	Q V			
6+55	0.0705	0.15	Q V			
7+ 0	0.0715	0.15	Q V			
7+ 5	0.0726	0.15	Q V			
7+10	0.0736	0.15	Q V			
7+15	0.0746	0.15	Q V			
7+20	0.0757	0.15	Q V			
7+25	0.0767	0.15	Q V			
7+30	0.0778	0.15	Q V			
7+35	0.0788	0.15	Q V			
7+40	0.0799	0.15	Q V			
7+45	0.0810	0.16	Q V			
7+50	0.0820	0.16	Q V			
7+55	0.0831	0.16	Q V			
8+ 0	0.0842	0.16	Q V			
8+ 5	0.0853	0.16	Q V			
8+10	0.0864	0.16	Q V			
8+15	0.0875	0.16	Q V			
8+20	0.0886	0.16	Q V			
8+25	0.0897	0.16	Q V			
8+30	0.0908	0.16	Q V			
8+35	0.0920	0.16	Q V			

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 8+40       0.0931      0.16  Q      V  |         |         |         |
 8+45       0.0942      0.17  Q      V  |         |         |         |
 8+50       0.0954      0.17  Q      V  |         |         |         |
 8+55       0.0965      0.17  Q       V |         |         |         |
 9+ 0       0.0977      0.17  Q       V |         |         |         |
 9+ 5       0.0989      0.17  Q       V |         |         |         |
 9+10       0.1000      0.17  Q       V |         |         |         |
 9+15       0.1012      0.17  Q       V |         |         |         |
 9+20       0.1024      0.17  Q       V |         |         |         |
 9+25       0.1036      0.17  Q       V |         |         |         |
 9+30       0.1048      0.17  Q       V |         |         |         |
 9+35       0.1060      0.18  Q       V |         |         |         |
 9+40       0.1072      0.18  Q       V |         |         |         |
 9+45       0.1084      0.18  Q        V|         |         |         |
 9+50       0.1096      0.18  Q        V|         |         |         |
 9+55       0.1109      0.18  Q        V|         |         |         |
10+ 0       0.1121      0.18  Q        V|         |         |         |
10+ 5       0.1134      0.18  Q        V|         |         |         |
10+10       0.1146      0.18  Q        V|         |         |         |
10+15       0.1159      0.18  Q        V|         |         |         |
10+20       0.1172      0.19  Q        V|         |         |         |
10+25       0.1185      0.19  Q        V|         |         |         |
10+30       0.1198      0.19  Q         V         |         |         |
10+35       0.1211      0.19  Q         V         |         |         |
10+40       0.1224      0.19  Q         V         |         |         |
10+45       0.1237      0.19  Q         V         |         |         |
10+50       0.1251      0.19  Q         V         |         |         |
10+55       0.1264      0.20  Q         V         |         |         |
11+ 0       0.1278      0.20  Q         V         |         |         |
11+ 5       0.1291      0.20  Q         V         |         |         |
11+10       0.1305      0.20  Q         V         |         |         |
11+15       0.1319      0.20  Q         |V        |         |         |
11+20       0.1333      0.20  Q         |V        |         |         |
11+25       0.1347      0.21  Q         |V        |         |         |
11+30       0.1361      0.21  Q         |V        |         |         |
11+35       0.1376      0.21  Q         |V        |         |         |
11+40       0.1390      0.21  Q         |V        |         |         |
11+45       0.1405      0.21  Q         |V        |         |         |
11+50       0.1419      0.21  Q         |V        |         |         |
11+55       0.1434      0.22  Q         | V       |         |         |
12+ 0       0.1449      0.22  Q         | V       |         |         |
12+ 5       0.1465      0.22  Q         | V       |         |         |
12+10       0.1480      0.22  Q         | V       |         |         |
12+15       0.1496      0.23  Q         | V       |         |         |
12+20       0.1512      0.23  Q         | V       |         |         |
12+25       0.1528      0.23  Q         | V       |         |         |
12+30       0.1544      0.24  Q         | V       |         |         |
12+35       0.1560      0.24  Q         |  V      |         |         |
12+40       0.1577      0.24  Q         |  V      |         |         |
12+45       0.1594      0.24  Q         |  V      |         |         |
12+50       0.1611      0.25  Q         |  V      |         |         |
12+55       0.1628      0.25  |Q        |  V      |         |         |
13+ 0       0.1646      0.25  |Q        |  V      |         |         |
13+ 5       0.1663      0.26  |Q        |  V      |         |         |
13+10       0.1681      0.26  |Q        |   V     |         |         |
13+15       0.1699      0.26  |Q        |   V     |         |         |
13+20       0.1718      0.27  |Q        |   V     |         |         |
13+25       0.1737      0.27  |Q        |   V     |         |         |
13+30       0.1755      0.27  |Q        |   V     |         |         |
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13+35       0.1775      0.28  |Q        |   V     |         |         |
13+40       0.1794      0.28  |Q        |    V    |         |         |
13+45       0.1814      0.29  |Q        |    V    |         |         |
13+50       0.1834      0.29  |Q        |    V    |         |         |
13+55       0.1855      0.30  |Q        |    V    |         |         |
14+ 0       0.1875      0.30  |Q        |    V    |         |         |
14+ 5       0.1897      0.31  |Q        |    V    |         |         |
14+10       0.1918      0.31  |Q        |     V   |         |         |
14+15       0.1940      0.32  |Q        |     V   |         |         |
14+20       0.1963      0.33  |Q        |     V   |         |         |
14+25       0.1986      0.33  |Q        |     V   |         |         |
14+30       0.2009      0.34  |Q        |     V   |         |         |
14+35       0.2033      0.35  |Q        |      V  |         |         |
14+40       0.2058      0.36  |Q        |      V  |         |         |
14+45       0.2083      0.37  |Q        |      V  |         |         |
14+50       0.2109      0.38  |Q        |      V  |         |         |
14+55       0.2135      0.39  |Q        |      V  |         |         |
15+ 0       0.2163      0.40  |Q        |       V |         |         |
15+ 5       0.2191      0.41  |Q        |       V |         |         |
15+10       0.2220      0.43  |Q        |       V |         |         |
15+15       0.2251      0.44  |Q        |       V |         |         |
15+20       0.2282      0.46  |Q        |        V|         |         |
15+25       0.2315      0.48  |Q        |        V|         |         |
15+30       0.2348      0.48  |Q        |        V|         |         |
15+35       0.2380      0.47  |Q        |        V|         |         |
15+40       0.2414      0.48  |Q        |         V         |         |
15+45       0.2449      0.52  | Q       |         V         |         |
15+50       0.2488      0.57  | Q       |         V         |         |
15+55       0.2533      0.65  | Q       |         |V        |         |
16+ 0       0.2591      0.83  |  Q      |         |V        |         |
16+ 5       0.2687      1.41  |    Q    |         | V       |         |
16+10       0.2859      2.49  |        Q|         |  V      |         |
16+15       0.3063      2.96  |         |Q        |    V    |         |
16+20       0.3208      2.10  |       Q |         |     V   |         |
16+25       0.3301      1.36  |    Q    |         |      V  |         |
16+30       0.3374      1.06  |   Q     |         |       V |         |
16+35       0.3437      0.92  |  Q      |         |       V |         |
16+40       0.3492      0.80  |  Q      |         |        V|         |
16+45       0.3542      0.72  | Q       |         |        V|         |
16+50       0.3586      0.64  | Q       |         |         V         |
16+55       0.3626      0.58  | Q       |         |         V         |
17+ 0       0.3663      0.54  | Q       |         |         V         |
17+ 5       0.3697      0.50  | Q       |         |         V         |
17+10       0.3729      0.46  |Q        |         |         |V        |
17+15       0.3759      0.43  |Q        |         |         |V        |
17+20       0.3786      0.40  |Q        |         |         |V        |
17+25       0.3812      0.38  |Q        |         |         |V        |
17+30       0.3837      0.36  |Q        |         |         | V       |
17+35       0.3861      0.34  |Q        |         |         | V       |
17+40       0.3882      0.31  |Q        |         |         | V       |
17+45       0.3902      0.29  |Q        |         |         | V       |
17+50       0.3921      0.28  |Q        |         |         | V       |
17+55       0.3940      0.27  |Q        |         |         | V       |
18+ 0       0.3958      0.26  |Q        |         |         |  V      |
18+ 5       0.3976      0.26  |Q        |         |         |  V      |
18+10       0.3993      0.25  Q         |         |         |  V      |
18+15       0.4009      0.24  Q         |         |         |  V      |
18+20       0.4025      0.23  Q         |         |         |  V      |
18+25       0.4041      0.23  Q         |         |         |  V      |
```

18+30	0.4057	0.22	Q			V
18+35	0.4072	0.22	Q			V
18+40	0.4087	0.22	Q			V
18+45	0.4101	0.21	Q			V
18+50	0.4115	0.21	Q			V
18+55	0.4129	0.20	Q			V
19+ 0	0.4143	0.20	Q			V
19+ 5	0.4157	0.20	Q			V
19+10	0.4170	0.19	Q			V
19+15	0.4183	0.19	Q			V
19+20	0.4196	0.19	Q			V
19+25	0.4209	0.19	Q			V
19+30	0.4222	0.18	Q			V
19+35	0.4234	0.18	Q			V
19+40	0.4246	0.18	Q			V
19+45	0.4258	0.18	Q			V
19+50	0.4270	0.17	Q			V
19+55	0.4282	0.17	Q			V
20+ 0	0.4294	0.17	Q			V
20+ 5	0.4305	0.17	Q			V
20+10	0.4317	0.17	Q			V
20+15	0.4328	0.16	Q			V
20+20	0.4339	0.16	Q			V
20+25	0.4350	0.16	Q			V
20+30	0.4361	0.16	Q			V
20+35	0.4372	0.16	Q			V
20+40	0.4383	0.16	Q			V
20+45	0.4394	0.15	Q			V
20+50	0.4404	0.15	Q			V
20+55	0.4415	0.15	Q			V
21+ 0	0.4425	0.15	Q			V
21+ 5	0.4435	0.15	Q			V
21+10	0.4445	0.15	Q			V
21+15	0.4455	0.15	Q			V
21+20	0.4465	0.14	Q			V
21+25	0.4475	0.14	Q			V
21+30	0.4485	0.14	Q			V
21+35	0.4495	0.14	Q			V
21+40	0.4505	0.14	Q			V
21+45	0.4514	0.14	Q			V
21+50	0.4524	0.14	Q			V
21+55	0.4533	0.14	Q			V
22+ 0	0.4542	0.14	Q			V
22+ 5	0.4552	0.14	Q			V
22+10	0.4561	0.13	Q			V
22+15	0.4570	0.13	Q			V
22+20	0.4579	0.13	Q			V
22+25	0.4588	0.13	Q			V
22+30	0.4597	0.13	Q			V
22+35	0.4606	0.13	Q			V
22+40	0.4615	0.13	Q			V
22+45	0.4624	0.13	Q			V
22+50	0.4633	0.13	Q			V
22+55	0.4641	0.13	Q			V
23+ 0	0.4650	0.13	Q			V
23+ 5	0.4658	0.12	Q			V
23+10	0.4667	0.12	Q			V
23+15	0.4675	0.12	Q			V
23+20	0.4684	0.12	Q			V

23+25	0.4692	0.12	Q	V
23+30	0.4701	0.12	Q	V
23+35	0.4709	0.12	Q	V
23+40	0.4717	0.12	Q	V
23+45	0.4725	0.12	Q	V
23+50	0.4733	0.12	Q	V
23+55	0.4741	0.12	Q	V
24+ 0	0.4750	0.12	Q	V
24+ 5	0.4757	0.11	Q	V
24+10	0.4763	0.09	Q	V
24+15	0.4767	0.06	Q	V
24+20	0.4770	0.04	Q	V
24+25	0.4772	0.03	Q	V
24+30	0.4773	0.02	Q	V
24+35	0.4775	0.02	Q	V
24+40	0.4776	0.01	Q	V
24+45	0.4776	0.01	Q	V
24+50	0.4777	0.01	Q	V
24+55	0.4777	0.01	Q	V
25+ 0	0.4778	0.01	Q	V
25+ 5	0.4778	0.00	Q	V
25+10	0.4778	0.00	Q	V
25+15	0.4779	0.00	Q	V
25+20	0.4779	0.00	Q	V
25+25	0.4779	0.00	Q	V
25+30	0.4779	0.00	Q	V
25+35	0.4779	0.00	Q	V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA B3
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
5.30	1	1.20
Rainfall data for year 100		
5.30	6	3.00
Rainfall data for year 100		
5.30	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	5.30	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     5.30   1.000          76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.420 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       5.30(Ac.)
Catchment Lag time =   0.336 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 24.8016
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       5.30(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
--------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
--------------------------------------------------------------------
            (K =        64.10 (CFS))

  1                2.279                    1.461
  2                9.823                    4.836
  3               23.222                    8.588
  4               40.500                   11.075
  5               55.920                    9.884
  6               65.571                    6.186
  7               71.760                    3.967
  8               75.929                    2.672
  9               79.296                    2.158
 10               82.060                    1.772
 11               84.416                    1.510
 12               86.434                    1.294
 13               88.100                    1.068
 14               89.589                    0.955
```

15	90.921	0.854
16	92.015	0.701
17	92.993	0.627
18	93.789	0.510
19	94.564	0.497
20	95.309	0.477
21	95.983	0.432
22	96.531	0.351
23	97.043	0.328
24	97.491	0.287
25	97.905	0.265
26	98.254	0.224
27	98.570	0.203
28	98.820	0.160
29	99.068	0.159
30	99.316	0.159
31	99.564	0.159
32	99.813	0.159
33	100.000	0.120

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6890	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1153	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2498	0.0501
14	1.2981	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4762	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8165	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9171	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297

38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181

97	3.4820	0.0180
98	3.4999	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7080	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142

156	4.4158	0.0142
157	4.4300	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121

215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6678	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107

274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066

40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083

99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139

158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0252	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0283
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122

217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063

276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

Total soil rain loss = 2.43(In)

Total effective rainfall = 3.57(In)

Peak flow rate in flood hydrograph = 7.20(CFS)

24 - H O U R   S T O R M

R u n o f f   H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
---------------------------------------------------------------------------
  0+ 5     0.0001      0.01  Q         |         |         |         |
  0+10     0.0003      0.04  Q         |         |         |         |
  0+15     0.0009      0.09  Q         |         |         |         |
  0+20     0.0020      0.15  Q         |         |         |         |
  0+25     0.0034      0.21  Q         |         |         |         |
  0+30     0.0051      0.25  Q         |         |         |         |
  0+35     0.0070      0.27  VQ        |         |         |         |
  0+40     0.0090      0.29  VQ        |         |         |         |
  0+45     0.0111      0.30  VQ        |         |         |         |
  0+50     0.0132      0.31  VQ        |         |         |         |
  0+55     0.0154      0.32  VQ        |         |         |         |
  1+ 0     0.0177      0.33  VQ        |         |         |         |
  1+ 5     0.0201      0.34  VQ        |         |         |         |
  1+10     0.0224      0.34  VQ        |         |         |         |
  1+15     0.0249      0.35  VQ        |         |         |         |
  1+20     0.0273      0.36  VQ        |         |         |         |
  1+25     0.0298      0.36  VQ        |         |         |         |
  1+30     0.0323      0.36  VQ        |         |         |         |
  1+35     0.0348      0.37  VQ        |         |         |         |
  1+40     0.0374      0.37  VQ        |         |         |         |
  1+45     0.0400      0.38  |Q        |         |         |         |
  1+50     0.0426      0.38  |Q        |         |         |         |
  1+55     0.0452      0.38  |Q        |         |         |         |
  2+ 0     0.0479      0.38  |Q        |         |         |         |
  2+ 5     0.0506      0.39  |Q        |         |         |         |
  2+10     0.0532      0.39  |Q        |         |         |         |
  2+15     0.0559      0.39  |Q        |         |         |         |
  2+20     0.0587      0.39  |Q        |         |         |         |
  2+25     0.0614      0.40  |Q        |         |         |         |
  2+30     0.0641      0.40  |Q        |         |         |         |
  2+35     0.0669      0.40  |Q        |         |         |         |
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2+40	0.0697	0.40	Q				
2+45	0.0725	0.40	Q				
2+50	0.0753	0.41	Q				
2+55	0.0781	0.41	Q				
3+ 0	0.0809	0.41	QV				
3+ 5	0.0837	0.41	QV				
3+10	0.0865	0.41	QV				
3+15	0.0894	0.41	QV				
3+20	0.0922	0.41	QV				
3+25	0.0951	0.41	QV				
3+30	0.0979	0.42	QV				
3+35	0.1008	0.42	QV				
3+40	0.1037	0.42	QV				
3+45	0.1066	0.42	QV				
3+50	0.1095	0.42	QV				
3+55	0.1124	0.42	QV				
4+ 0	0.1153	0.42	QV				
4+ 5	0.1183	0.43	Q V				
4+10	0.1212	0.43	Q V				
4+15	0.1242	0.43	Q V				
4+20	0.1271	0.43	Q V				
4+25	0.1301	0.43	Q V				
4+30	0.1331	0.43	Q V				
4+35	0.1361	0.43	Q V				
4+40	0.1391	0.44	Q V				
4+45	0.1421	0.44	Q V				
4+50	0.1451	0.44	Q V				
4+55	0.1482	0.44	Q V				
5+ 0	0.1512	0.44	Q V				
5+ 5	0.1543	0.44	Q V				
5+10	0.1573	0.45	Q V				
5+15	0.1604	0.45	Q V				
5+20	0.1635	0.45	Q V				
5+25	0.1666	0.45	Q V				
5+30	0.1697	0.45	Q V				
5+35	0.1729	0.45	Q V				
5+40	0.1760	0.46	Q V				
5+45	0.1791	0.46	Q V				
5+50	0.1823	0.46	Q V				
5+55	0.1855	0.46	Q V				
6+ 0	0.1887	0.46	Q V				
6+ 5	0.1919	0.46	Q V				
6+10	0.1951	0.47	Q V				
6+15	0.1983	0.47	Q V				
6+20	0.2016	0.47	Q V				
6+25	0.2048	0.47	Q V				
6+30	0.2081	0.47	Q V				
6+35	0.2114	0.48	Q V				
6+40	0.2147	0.48	Q V				
6+45	0.2180	0.48	Q V				
6+50	0.2213	0.48	Q V				
6+55	0.2246	0.48	Q V				
7+ 0	0.2280	0.49	Q V				
7+ 5	0.2313	0.49	Q V				
7+10	0.2347	0.49	Q V				
7+15	0.2381	0.49	Q V				
7+20	0.2415	0.50	Q V				
7+25	0.2450	0.50	Q V				
7+30	0.2484	0.50	Q V				

7+35	0.2519	0.50	Q V			
7+40	0.2553	0.50	Q V			
7+45	0.2588	0.51	Q V			
7+50	0.2623	0.51	Q V			
7+55	0.2659	0.51	Q V			
8+ 0	0.2694	0.51	Q V			
8+ 5	0.2730	0.52	Q V			
8+10	0.2765	0.52	Q V			
8+15	0.2801	0.52	Q V			
8+20	0.2837	0.52	Q V			
8+25	0.2874	0.53	Q V			
8+30	0.2910	0.53	Q V			
8+35	0.2947	0.53	Q V			
8+40	0.2984	0.54	Q V			
8+45	0.3021	0.54	Q V			
8+50	0.3058	0.54	Q V			
8+55	0.3096	0.54	Q V			
9+ 0	0.3133	0.55	Q V			
9+ 5	0.3171	0.55	Q V			
9+10	0.3209	0.55	Q V			
9+15	0.3248	0.56	Q V			
9+20	0.3286	0.56	Q V			
9+25	0.3325	0.56	Q V			
9+30	0.3364	0.57	Q V			
9+35	0.3403	0.57	Q V			
9+40	0.3443	0.57	Q V			
9+45	0.3483	0.58	Q V			
9+50	0.3523	0.58	Q V			
9+55	0.3563	0.58	Q V			
10+ 0	0.3603	0.59	Q V			
10+ 5	0.3644	0.59	Q V			
10+10	0.3685	0.60	Q V			
10+15	0.3726	0.60	Q V			
10+20	0.3768	0.60	Q V			
10+25	0.3810	0.61	Q V			
10+30	0.3852	0.61	Q V			
10+35	0.3894	0.62	Q V			
10+40	0.3937	0.62	Q V			
10+45	0.3980	0.62	Q V			
10+50	0.4023	0.63	Q V			
10+55	0.4067	0.63	Q V			
11+ 0	0.4111	0.64	Q V			
11+ 5	0.4155	0.64	Q V			
11+10	0.4200	0.65	Q V			
11+15	0.4245	0.65	Q V			
11+20	0.4290	0.66	Q V			
11+25	0.4336	0.66	Q V			
11+30	0.4382	0.67	Q	V		
11+35	0.4429	0.68	Q	V		
11+40	0.4476	0.68	Q	V		
11+45	0.4523	0.69	Q	V		
11+50	0.4571	0.69	Q	V		
11+55	0.4619	0.70	Q	V		
12+ 0	0.4668	0.71	Q	V		
12+ 5	0.4717	0.71	Q	V		
12+10	0.4766	0.72	Q	V		
12+15	0.4817	0.73	Q	V		
12+20	0.4868	0.74	Q	V		
12+25	0.4919	0.75	Q	V		

```
12+30       0.4972      0.76  |  Q      | V       |         |         |
12+35       0.5025      0.77  |  Q      | V       |         |         |
12+40       0.5078      0.78  |  Q      | V       |         |         |
12+45       0.5132      0.79  |  Q      |  V      |         |         |
12+50       0.5187      0.80  |  Q      |  V      |         |         |
12+55       0.5243      0.81  |  Q      |  V      |         |         |
13+ 0       0.5299      0.81  |  Q      |  V      |         |         |
13+ 5       0.5356      0.82  |  Q      |  V      |         |         |
13+10       0.5413      0.84  |  Q      |  V      |         |         |
13+15       0.5471      0.85  |  Q      |  V      |         |         |
13+20       0.5530      0.86  |  Q      |   V     |         |         |
13+25       0.5590      0.87  |  Q      |   V     |         |         |
13+30       0.5651      0.88  |  Q      |   V     |         |         |
13+35       0.5712      0.89  |  Q      |   V     |         |         |
13+40       0.5775      0.91  |  Q      |   V     |         |         |
13+45       0.5838      0.92  |  Q      |   V     |         |         |
13+50       0.5902      0.93  |  Q      |   V     |         |         |
13+55       0.5967      0.95  |  Q      |    V    |         |         |
14+ 0       0.6034      0.96  |  Q      |    V    |         |         |
14+ 5       0.6101      0.98  |  Q      |    V    |         |         |
14+10       0.6170      1.00  |  Q      |    V    |         |         |
14+15       0.6240      1.01  |   Q     |    V    |         |         |
14+20       0.6311      1.03  |   Q     |     V   |         |         |
14+25       0.6384      1.05  |   Q     |     V   |         |         |
14+30       0.6458      1.08  |   Q     |     V   |         |         |
14+35       0.6533      1.10  |   Q     |     V   |         |         |
14+40       0.6611      1.12  |   Q     |     V   |         |         |
14+45       0.6690      1.15  |   Q     |     V   |         |         |
14+50       0.6771      1.18  |   Q     |      V  |         |         |
14+55       0.6855      1.21  |   Q     |      V  |         |         |
15+ 0       0.6940      1.24  |   Q     |      V  |         |         |
15+ 5       0.7028      1.28  |    Q    |      V  |         |         |
15+10       0.7119      1.32  |    Q    |       V |         |         |
15+15       0.7213      1.37  |    Q    |       V |         |         |
15+20       0.7311      1.42  |    Q    |       V |         |         |
15+25       0.7412      1.46  |    Q    |       V |         |         |
15+30       0.7515      1.50  |    Q    |        V|         |         |
15+35       0.7619      1.52  |     Q   |        V|         |         |
15+40       0.7725      1.54  |     Q   |        V|         |         |
15+45       0.7834      1.58  |     Q   |        V|         |         |
15+50       0.7950      1.68  |     Q   |         V         |         |
15+55       0.8077      1.85  |      Q  |         V         |         |
16+ 0       0.8228      2.19  |       Q |         V         |         |
16+ 5       0.8448      3.19  |         | Q       |V        |         |
16+10       0.8782      4.85  |         |        Q| V       |         |
16+15       0.9226      6.44  |         |         |  V Q    |         |
16+20       0.9722      7.20  |         |         |   V   Q |         |
16+25       1.0164      6.43  |         |         |    Q    |         |
16+30       1.0493      4.78  |         |        Q|     V   |         |
16+35       1.0749      3.71  |         |   Q     |      V  |         |
16+40       1.0961      3.08  |         | Q       |      V  |         |
16+45       1.1151      2.76  |         |Q        |       V |         |
16+50       1.1323      2.50  |        Q|         |       V |         |
16+55       1.1480      2.29  |        Q|         |        V|         |
17+ 0       1.1626      2.11  |       Q |         |        V|         |
17+ 5       1.1760      1.95  |      Q  |         |        V|         |
17+10       1.1886      1.83  |      Q  |         |         V         |
17+15       1.2004      1.72  |     Q   |         |         V         |
17+20       1.2114      1.60  |     Q   |         |         V         |
```

17+25	1.2218	1.51	Q			V
17+30	1.2316	1.42	Q			V
17+35	1.2410	1.37	Q			V
17+40	1.2501	1.32	Q			V
17+45	1.2588	1.26	Q			V
17+50	1.2670	1.19	Q			V
17+55	1.2750	1.15	Q			V
18+ 0	1.2825	1.10	Q			V
18+ 5	1.2899	1.06	Q			V
18+10	1.2969	1.02	Q			V
18+15	1.3036	0.98	Q			V
18+20	1.3101	0.94	Q			V
18+25	1.3163	0.91	Q			V
18+30	1.3225	0.89	Q			V
18+35	1.3284	0.87	Q			V
18+40	1.3342	0.84	Q			V
18+45	1.3397	0.80	Q			V
18+50	1.3448	0.74	Q			V
18+55	1.3498	0.72	Q			V
19+ 0	1.3546	0.70	Q			V
19+ 5	1.3594	0.69	Q			V
19+10	1.3641	0.68	Q			V
19+15	1.3686	0.67	Q			V
19+20	1.3732	0.65	Q			V
19+25	1.3776	0.64	Q			V
19+30	1.3819	0.63	Q			V
19+35	1.3862	0.62	Q			V
19+40	1.3905	0.61	Q			V
19+45	1.3946	0.61	Q			V
19+50	1.3987	0.60	Q			V
19+55	1.4028	0.59	Q			V
20+ 0	1.4068	0.58	Q			V
20+ 5	1.4108	0.57	Q			V
20+10	1.4147	0.57	Q			V
20+15	1.4185	0.56	Q			V
20+20	1.4223	0.55	Q			V
20+25	1.4261	0.55	Q			V
20+30	1.4298	0.54	Q			V
20+35	1.4335	0.54	Q			V
20+40	1.4372	0.53	Q			V
20+45	1.4408	0.52	Q			V
20+50	1.4443	0.52	Q			V
20+55	1.4479	0.51	Q			V
21+ 0	1.4514	0.51	Q			V
21+ 5	1.4549	0.50	Q			V
21+10	1.4583	0.50	Q			V
21+15	1.4617	0.49	Q			V
21+20	1.4651	0.49	Q			V
21+25	1.4684	0.49	Q			V
21+30	1.4717	0.48	Q			V
21+35	1.4750	0.48	Q			V
21+40	1.4783	0.47	Q			V
21+45	1.4815	0.47	Q			V
21+50	1.4847	0.47	Q			V
21+55	1.4879	0.46	Q			V
22+ 0	1.4911	0.46	Q			V
22+ 5	1.4942	0.45	Q			V
22+10	1.4973	0.45	Q			V
22+15	1.5004	0.45	Q			V

22+20	1.5034	0.44	Q				V
22+25	1.5065	0.44	Q				V
22+30	1.5095	0.44	Q				V
22+35	1.5125	0.44	Q				V
22+40	1.5155	0.43	Q				V
22+45	1.5184	0.43	Q				V
22+50	1.5214	0.43	Q				V
22+55	1.5243	0.42	Q				V
23+ 0	1.5272	0.42	Q				V
23+ 5	1.5301	0.42	Q				V
23+10	1.5329	0.42	Q				V
23+15	1.5358	0.41	Q				V
23+20	1.5386	0.41	Q				V
23+25	1.5414	0.41	Q				V
23+30	1.5442	0.41	Q				V
23+35	1.5470	0.40	Q				V
23+40	1.5497	0.40	Q				V
23+45	1.5525	0.40	Q				V
23+50	1.5552	0.40	Q				V
23+55	1.5579	0.39	Q				V
24+ 0	1.5606	0.39	Q				V
24+ 5	1.5632	0.38	Q				V
24+10	1.5656	0.35	Q				V
24+15	1.5677	0.30	Q				V
24+20	1.5693	0.23	Q				V
24+25	1.5704	0.17	Q				V
24+30	1.5714	0.13	Q				V
24+35	1.5721	0.11	Q				V
24+40	1.5728	0.09	Q				V
24+45	1.5733	0.08	Q				V
24+50	1.5738	0.07	Q				V
24+55	1.5742	0.06	Q				V
25+ 0	1.5746	0.05	Q				V
25+ 5	1.5749	0.05	Q				V
25+10	1.5752	0.04	Q				V
25+15	1.5755	0.04	Q				V
25+20	1.5757	0.03	Q				V
25+25	1.5759	0.03	Q				V
25+30	1.5760	0.02	Q				V
25+35	1.5762	0.02	Q				V
25+40	1.5763	0.02	Q				V
25+45	1.5764	0.02	Q				V
25+50	1.5765	0.01	Q				V
25+55	1.5766	0.01	Q				V
26+ 0	1.5766	0.01	Q				V
26+ 5	1.5767	0.01	Q				V
26+10	1.5767	0.01	Q				V
26+15	1.5768	0.01	Q				V
26+20	1.5768	0.00	Q				V
26+25	1.5768	0.00	Q				V
26+30	1.5769	0.00	Q				V
26+35	1.5769	0.00	Q				V
26+40	1.5769	0.00	Q				V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA B4
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
3.16	1	1.20
Rainfall data for year 100		
3.16	6	3.00
Rainfall data for year 100		
3.16	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	3.16	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     3.16   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.323 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       3.16(Ac.)
Catchment Lag time =   0.258 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 32.2497
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       3.16(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        38.22 (CFS))

  1                3.200                  1.223
  2               15.329                  4.635
  3               36.084                  7.932
  4               56.372                  7.753
  5               67.965                  4.431
  6               74.579                  2.527
  7               79.136                  1.742
  8               82.675                  1.353
  9               85.565                  1.104
 10               87.865                  0.879
 11               89.812                  0.744
 12               91.418                  0.614
 13               92.768                  0.516
 14               93.832                  0.406
```

15	94.829	0.381
16	95.764	0.358
17	96.507	0.284
18	97.158	0.249
19	97.729	0.218
20	98.204	0.182
21	98.610	0.155
22	98.934	0.124
23	99.256	0.123
24	99.579	0.123
25	100.000	0.062

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7732	0.0840
5	0.8453	0.0722
6	0.9093	0.0640
7	0.9671	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1154	0.0460
11	1.1588	0.0433
12	1.1998	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3449	0.0466
16	1.3900	0.0451
17	1.4338	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6359	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270

46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174

105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139

164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119

223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106

282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067

48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087

107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157

166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0207
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0403	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0640	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4441	0.0364	0.4077
194	0.0840	0.0364	0.0477
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0174
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103

225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061

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284             0.0107          0.0047           0.0060
285             0.0106          0.0046           0.0060
286             0.0106          0.0046           0.0060
287             0.0105          0.0046           0.0059
288             0.0105          0.0046           0.0059
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      4.97(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0         2.5        5.0        7.5       10.0
-----------------------------------------------------------------------
  0+ 5       0.0000      0.01  Q          |          |          |          |
  0+10       0.0003      0.03  Q          |          |          |          |
  0+15       0.0008      0.08  Q          |          |          |          |
  0+20       0.0017      0.13  Q          |          |          |          |
  0+25       0.0028      0.15  Q          |          |          |          |
  0+30       0.0039      0.17  Q          |          |          |          |
  0+35       0.0052      0.18  Q          |          |          |          |
  0+40       0.0065      0.19  Q          |          |          |          |
  0+45       0.0078      0.19  Q          |          |          |          |
  0+50       0.0092      0.20  Q          |          |          |          |
  0+55       0.0106      0.21  Q          |          |          |          |
  1+ 0       0.0120      0.21  Q          |          |          |          |
  1+ 5       0.0135      0.21  Q          |          |          |          |
  1+10       0.0150      0.22  Q          |          |          |          |
  1+15       0.0165      0.22  Q          |          |          |          |
  1+20       0.0180      0.22  Q          |          |          |          |
  1+25       0.0195      0.22  Q          |          |          |          |
  1+30       0.0211      0.23  Q          |          |          |          |
  1+35       0.0227      0.23  Q          |          |          |          |
  1+40       0.0242      0.23  QV         |          |          |          |
  1+45       0.0258      0.23  QV         |          |          |          |
  1+50       0.0274      0.23  QV         |          |          |          |
  1+55       0.0290      0.23  QV         |          |          |          |
  2+ 0       0.0307      0.24  QV         |          |          |          |
  2+ 5       0.0323      0.24  QV         |          |          |          |
  2+10       0.0339      0.24  QV         |          |          |          |
  2+15       0.0356      0.24  QV         |          |          |          |
  2+20       0.0372      0.24  QV         |          |          |          |
  2+25       0.0388      0.24  QV         |          |          |          |
  2+30       0.0405      0.24  QV         |          |          |          |
  2+35       0.0421      0.24  QV         |          |          |          |
  2+40       0.0438      0.24  QV         |          |          |          |
  2+45       0.0455      0.24  QV         |          |          |          |
  2+50       0.0471      0.24  Q V        |          |          |          |
  2+55       0.0488      0.24  Q V        |          |          |          |
  3+ 0       0.0505      0.24  Q V        |          |          |          |
  3+ 5       0.0522      0.24  Q V        |          |          |          |
  3+10       0.0539      0.25  Q V        |          |          |          |
  3+15       0.0556      0.25  Q V        |          |          |          |
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3+20	0.0573	0.25	Q V
3+25	0.0590	0.25	Q V
3+30	0.0607	0.25	Q V
3+35	0.0624	0.25	Q V
3+40	0.0641	0.25	QV
3+45	0.0659	0.25	QV
3+50	0.0676	0.25	QV
3+55	0.0693	0.25	QV
4+ 0	0.0711	0.25	Q V
4+ 5	0.0728	0.25	Q V
4+10	0.0746	0.26	Q V
4+15	0.0764	0.26	Q V
4+20	0.0781	0.26	Q V
4+25	0.0799	0.26	Q V
4+30	0.0817	0.26	Q V
4+35	0.0835	0.26	Q V
4+40	0.0853	0.26	Q V
4+45	0.0871	0.26	Q V
4+50	0.0889	0.26	Q V
4+55	0.0907	0.26	Q V
5+ 0	0.0925	0.26	Q V
5+ 5	0.0943	0.27	Q V
5+10	0.0962	0.27	Q V
5+15	0.0980	0.27	Q V
5+20	0.0999	0.27	Q V
5+25	0.1017	0.27	Q V
5+30	0.1036	0.27	Q V
5+35	0.1055	0.27	Q V
5+40	0.1073	0.27	Q V
5+45	0.1092	0.27	Q V
5+50	0.1111	0.27	Q V
5+55	0.1130	0.28	Q V
6+ 0	0.1149	0.28	Q V
6+ 5	0.1168	0.28	Q V
6+10	0.1188	0.28	Q V
6+15	0.1207	0.28	Q V
6+20	0.1226	0.28	Q V
6+25	0.1246	0.28	Q V
6+30	0.1265	0.28	Q V
6+35	0.1285	0.28	Q V
6+40	0.1305	0.29	Q V
6+45	0.1324	0.29	Q V
6+50	0.1344	0.29	Q V
6+55	0.1364	0.29	Q V
7+ 0	0.1384	0.29	Q V
7+ 5	0.1404	0.29	Q V
7+10	0.1425	0.29	Q V
7+15	0.1445	0.30	Q V
7+20	0.1465	0.30	Q V
7+25	0.1486	0.30	Q V
7+30	0.1506	0.30	Q V
7+35	0.1527	0.30	Q V
7+40	0.1548	0.30	Q V
7+45	0.1569	0.30	Q V
7+50	0.1590	0.30	Q V
7+55	0.1611	0.31	Q V
8+ 0	0.1632	0.31	Q V
8+ 5	0.1653	0.31	Q V
8+10	0.1675	0.31	Q V

8+15	0.1696	0.31	Q V			
8+20	0.1718	0.31	Q V			
8+25	0.1740	0.32	Q V			
8+30	0.1762	0.32	Q V			
8+35	0.1784	0.32	Q V			
8+40	0.1806	0.32	Q V			
8+45	0.1828	0.32	Q V			
8+50	0.1850	0.32	Q V			
8+55	0.1873	0.33	Q V			
9+ 0	0.1895	0.33	Q V			
9+ 5	0.1918	0.33	Q V			
9+10	0.1941	0.33	Q V			
9+15	0.1964	0.33	Q V			
9+20	0.1987	0.34	Q V			
9+25	0.2010	0.34	Q V			
9+30	0.2034	0.34	Q V			
9+35	0.2057	0.34	Q V			
9+40	0.2081	0.34	Q V			
9+45	0.2105	0.35	Q V			
9+50	0.2129	0.35	Q V			
9+55	0.2153	0.35	Q V			
10+ 0	0.2177	0.35	Q V			
10+ 5	0.2201	0.35	Q V			
10+10	0.2226	0.36	Q V			
10+15	0.2251	0.36	Q V			
10+20	0.2276	0.36	Q V			
10+25	0.2301	0.36	Q V			
10+30	0.2326	0.37	Q V			
10+35	0.2352	0.37	Q V			
10+40	0.2377	0.37	Q V			
10+45	0.2403	0.38	Q V			
10+50	0.2429	0.38	Q V			
10+55	0.2455	0.38	Q V			
11+ 0	0.2482	0.38	Q V			
11+ 5	0.2508	0.39	Q V			
11+10	0.2535	0.39	Q V			
11+15	0.2562	0.39	Q V			
11+20	0.2590	0.40	Q	V		
11+25	0.2617	0.40	Q	V		
11+30	0.2645	0.40	Q	V		
11+35	0.2673	0.41	Q	V		
11+40	0.2701	0.41	Q	V		
11+45	0.2729	0.41	Q	V		
11+50	0.2758	0.42	Q	V		
11+55	0.2787	0.42	Q	V		
12+ 0	0.2816	0.42	Q	V		
12+ 5	0.2846	0.43	Q	V		
12+10	0.2876	0.43	Q	V		
12+15	0.2906	0.44	Q	V		
12+20	0.2937	0.45	Q	V		
12+25	0.2968	0.45	Q	V		
12+30	0.3000	0.46	Q	V		
12+35	0.3032	0.46	Q	V		
12+40	0.3064	0.47	Q	V		
12+45	0.3097	0.48	Q	V		
12+50	0.3130	0.48	Q	V		
12+55	0.3164	0.49	Q	V		
13+ 0	0.3198	0.49	Q	V		
13+ 5	0.3232	0.50	Q	V		

13+10	0.3267	0.50	Q	V		
13+15	0.3302	0.51	Q	V		
13+20	0.3338	0.52	Q	V		
13+25	0.3374	0.53	Q	V		
13+30	0.3410	0.53	Q	V		
13+35	0.3448	0.54	Q	V		
13+40	0.3485	0.55	Q	V		
13+45	0.3524	0.56	Q	V		
13+50	0.3563	0.57	Q	V		
13+55	0.3602	0.57	Q	V		
14+ 0	0.3643	0.58	Q	V		
14+ 5	0.3684	0.59	Q	V		
14+10	0.3725	0.61	Q	V		
14+15	0.3768	0.62	Q	V		
14+20	0.3811	0.63	Q	V		
14+25	0.3855	0.64	Q	V		
14+30	0.3900	0.66	Q	V		
14+35	0.3947	0.67	Q	V		
14+40	0.3994	0.69	Q	V		
14+45	0.4042	0.70	Q	V		
14+50	0.4092	0.72	Q	V		
14+55	0.4143	0.74	Q	V		
15+ 0	0.4196	0.76	Q	V		
15+ 5	0.4250	0.79	Q	V		
15+10	0.4306	0.81	Q	V		
15+15	0.4364	0.84	Q	V		
15+20	0.4424	0.88	Q	V		
15+25	0.4487	0.91	Q	V		
15+30	0.4550	0.92	Q	V		
15+35	0.4613	0.92	Q	V		
15+40	0.4677	0.93	Q	V		
15+45	0.4745	0.98	Q		V	
15+50	0.4818	1.06	Q		V	
15+55	0.4900	1.19	Q		V	
16+ 0	0.5001	1.47	Q		V	
16+ 5	0.5159	2.30	Q		V	
16+10	0.5422	3.82		Q	V	
16+15	0.5765	4.97		Q	V	
16+20	0.6084	4.64		Q	V	
16+25	0.6305	3.20		Q	V	
16+30	0.6465	2.33	Q		V	
16+35	0.6597	1.92	Q		V	
16+40	0.6714	1.70	Q		V	
16+45	0.6819	1.52	Q		V	
16+50	0.6913	1.37	Q		V	
16+55	0.7000	1.25	Q		V	
17+ 0	0.7079	1.15	Q			V
17+ 5	0.7151	1.06	Q			V
17+10	0.7219	0.98	Q			V
17+15	0.7283	0.93	Q			V
17+20	0.7343	0.88	Q			V
17+25	0.7400	0.82	Q			V
17+30	0.7453	0.78	Q			V
17+35	0.7504	0.74	Q			V
17+40	0.7553	0.70	Q			V
17+45	0.7598	0.67	Q			V
17+50	0.7642	0.63	Q			V
17+55	0.7684	0.61	Q			V
18+ 0	0.7725	0.59	Q			V

18+ 5	0.7763	0.55	Q			V
18+10	0.7798	0.51	Q			V
18+15	0.7832	0.49	Q			V
18+20	0.7864	0.48	Q			V
18+25	0.7896	0.46	Q			V
18+30	0.7928	0.45	Q			V
18+35	0.7958	0.44	Q			V
18+40	0.7988	0.43	Q			V
18+45	0.8017	0.42	Q			V
18+50	0.8046	0.42	Q			V
18+55	0.8074	0.41	Q			V
19+ 0	0.8102	0.40	Q			V
19+ 5	0.8129	0.39	Q			V
19+10	0.8156	0.39	Q			V
19+15	0.8182	0.38	Q			V
19+20	0.8208	0.38	Q			V
19+25	0.8233	0.37	Q			V
19+30	0.8259	0.37	Q			V
19+35	0.8283	0.36	Q			V
19+40	0.8308	0.36	Q			V
19+45	0.8332	0.35	Q			V
19+50	0.8356	0.35	Q			V
19+55	0.8379	0.34	Q			V
20+ 0	0.8403	0.34	Q			V
20+ 5	0.8426	0.33	Q			V
20+10	0.8448	0.33	Q			V
20+15	0.8471	0.33	Q			V
20+20	0.8493	0.32	Q			V
20+25	0.8515	0.32	Q			V
20+30	0.8537	0.32	Q			V
20+35	0.8558	0.31	Q			V
20+40	0.8579	0.31	Q			V
20+45	0.8601	0.31	Q			V
20+50	0.8621	0.30	Q			V
20+55	0.8642	0.30	Q			V
21+ 0	0.8663	0.30	Q			V
21+ 5	0.8683	0.29	Q			V
21+10	0.8703	0.29	Q			V
21+15	0.8723	0.29	Q			V
21+20	0.8743	0.29	Q			V
21+25	0.8762	0.28	Q			V
21+30	0.8782	0.28	Q			V
21+35	0.8801	0.28	Q			V
21+40	0.8820	0.28	Q			V
21+45	0.8839	0.28	Q			V
21+50	0.8858	0.27	Q			V
21+55	0.8877	0.27	Q			V
22+ 0	0.8895	0.27	Q			V
22+ 5	0.8914	0.27	Q			V
22+10	0.8932	0.27	Q			V
22+15	0.8950	0.26	Q			V
22+20	0.8968	0.26	Q			V
22+25	0.8986	0.26	Q			V
22+30	0.9004	0.26	Q			V
22+35	0.9021	0.26	Q			V
22+40	0.9039	0.25	Q			V
22+45	0.9056	0.25	Q			V
22+50	0.9073	0.25	Q			V
22+55	0.9091	0.25	Q			V

23+ 0	0.9108	0.25	Q			V
23+ 5	0.9125	0.25	Q			V
23+10	0.9141	0.24	Q			V
23+15	0.9158	0.24	Q			V
23+20	0.9175	0.24	Q			V
23+25	0.9191	0.24	Q			V
23+30	0.9208	0.24	Q			V
23+35	0.9224	0.24	Q			V
23+40	0.9240	0.24	Q			V
23+45	0.9256	0.23	Q			V
23+50	0.9273	0.23	Q			V
23+55	0.9288	0.23	Q			V
24+ 0	0.9304	0.23	Q			V
24+ 5	0.9320	0.22	Q			V
24+10	0.9333	0.19	Q			V
24+15	0.9343	0.15	Q			V
24+20	0.9350	0.10	Q			V
24+25	0.9355	0.07	Q			V
24+30	0.9359	0.06	Q			V
24+35	0.9362	0.05	Q			V
24+40	0.9365	0.04	Q			V
24+45	0.9367	0.03	Q			V
24+50	0.9369	0.03	Q			V
24+55	0.9371	0.02	Q			V
25+ 0	0.9372	0.02	Q			V
25+ 5	0.9373	0.02	Q			V
25+10	0.9374	0.01	Q			V
25+15	0.9375	0.01	Q			V
25+20	0.9375	0.01	Q			V
25+25	0.9376	0.01	Q			V
25+30	0.9376	0.01	Q			V
25+35	0.9377	0.00	Q			V
25+40	0.9377	0.00	Q			V
25+45	0.9377	0.00	Q			V
25+50	0.9377	0.00	Q			V
25+55	0.9377	0.00	Q			V
26+ 0	0.9377	0.00	Q			V

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 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA B5
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
1.86	1	1.20
Rainfall data for year 100		
1.86	6	3.00
Rainfall data for year 100		
1.86	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	1.86	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     1.86   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.249 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       1.86(Ac.)
Catchment Lag time =   0.199 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 41.8340
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       1.86(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        22.49 (CFS))

  1                4.662                  1.049
  2               24.009                  4.352
  3               51.644                  6.216
  4               68.178                  3.719
  5               76.218                  1.809
  6               81.449                  1.177
  7               85.368                  0.882
  8               88.318                  0.664
  9               90.701                  0.536
 10               92.538                  0.413
 11               93.954                  0.318
 12               95.232                  0.288
 13               96.304                  0.241
 14               97.164                  0.193
```

15	97.882	0.162
16	98.460	0.130
17	98.903	0.100
18	99.321	0.094
19	99.739	0.094
20	100.000	0.059

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6892	0.1032
4	0.7732	0.0840
5	0.8454	0.0722
6	0.9094	0.0640
7	0.9672	0.0578
8	1.0203	0.0531
9	1.0695	0.0492
10	1.1155	0.0460
11	1.1589	0.0433
12	1.1999	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3450	0.0466
16	1.3901	0.0451
17	1.4339	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5582	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8508	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9497	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1926	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256

51	2.5150	0.0253
52	2.5401	0.0251
53	2.5649	0.0249
54	2.5896	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6622	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8020	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2404	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5882	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170

110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8406	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2131	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3157	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5139	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137

169	4.5962	0.0136
170	4.6098	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6503	0.0135
174	4.6637	0.0134
175	4.6771	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8348	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2082	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117

228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4199	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5453	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5902	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8737	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9687	0.0105
286	5.9791	0.0105

287	5.9896	0.0104	
288	6.0000	0.0104	

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068

53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090

112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172

171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0207
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0403	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0640	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4441	0.0364	0.4077
194	0.0840	0.0364	0.0477
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0174
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096

230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062
280	0.0109	0.0048	0.0062
281	0.0109	0.0047	0.0061
282	0.0108	0.0047	0.0061
283	0.0107	0.0047	0.0061
284	0.0107	0.0047	0.0060
285	0.0106	0.0046	0.0060
286	0.0106	0.0046	0.0060
287	0.0105	0.0046	0.0059
288	0.0105	0.0046	0.0059

```
    --------------------------------------------------------------------
    --------------------------------------------------------------------
    Total soil rain loss =      2.43(In)
    Total effective rainfall =      3.57(In)
    Peak flow rate in flood hydrograph =      3.45(CFS)
    ---------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R   S T O R M
                   R u n o f f     H y d r o g r a p h
    --------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    --------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5      0.0000      0.01  Q         |         |         |         |
  0+10      0.0003      0.03  Q         |         |         |         |
  0+15      0.0007      0.07  Q         |         |         |         |
  0+20      0.0014      0.09  Q         |         |         |         |
  0+25      0.0021      0.10  Q         |         |         |         |
  0+30      0.0028      0.11  Q         |         |         |         |
  0+35      0.0036      0.11  Q         |         |         |         |
  0+40      0.0044      0.12  Q         |         |         |         |
  0+45      0.0052      0.12  Q         |         |         |         |
  0+50      0.0061      0.12  Q         |         |         |         |
  0+55      0.0070      0.13  Q         |         |         |         |
  1+ 0      0.0078      0.13  Q         |         |         |         |
  1+ 5      0.0087      0.13  Q         |         |         |         |
  1+10      0.0096      0.13  Q         |         |         |         |
  1+15      0.0106      0.13  Q         |         |         |         |
  1+20      0.0115      0.13  Q         |         |         |         |
  1+25      0.0124      0.14  Q         |         |         |         |
  1+30      0.0134      0.14  Q         |         |         |         |
  1+35      0.0143      0.14  QV        |         |         |         |
  1+40      0.0152      0.14  QV        |         |         |         |
  1+45      0.0162      0.14  QV        |         |         |         |
  1+50      0.0171      0.14  QV        |         |         |         |
  1+55      0.0181      0.14  QV        |         |         |         |
  2+ 0      0.0191      0.14  QV        |         |         |         |
  2+ 5      0.0200      0.14  QV        |         |         |         |
  2+10      0.0210      0.14  QV        |         |         |         |
  2+15      0.0220      0.14  QV        |         |         |         |
  2+20      0.0229      0.14  QV        |         |         |         |
  2+25      0.0239      0.14  QV        |         |         |         |
  2+30      0.0249      0.14  QV        |         |         |         |
  2+35      0.0259      0.14  QV        |         |         |         |
  2+40      0.0268      0.14  QV        |         |         |         |
  2+45      0.0278      0.14  Q V       |         |         |         |
  2+50      0.0288      0.14  Q V       |         |         |         |
  2+55      0.0298      0.14  Q V       |         |         |         |
  3+ 0      0.0308      0.14  Q V       |         |         |         |
  3+ 5      0.0318      0.14  Q V       |         |         |         |
  3+10      0.0328      0.15  Q V       |         |         |         |
  3+15      0.0338      0.15  Q V       |         |         |         |
  3+20      0.0348      0.15  Q V       |         |         |         |
  3+25      0.0358      0.15  Q V       |         |         |         |
  3+30      0.0368      0.15  Q V       |         |         |         |
  3+35      0.0379      0.15  Q V       |         |         |         |
  3+40      0.0389      0.15  Q V       |         |         |         |
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3+45	0.0399	0.15	Q V
3+50	0.0409	0.15	Q V
3+55	0.0420	0.15	Q V
4+ 0	0.0430	0.15	Q V
4+ 5	0.0440	0.15	Q V
4+10	0.0451	0.15	Q V
4+15	0.0461	0.15	Q V
4+20	0.0472	0.15	Q V
4+25	0.0482	0.15	Q V
4+30	0.0493	0.15	Q V
4+35	0.0503	0.15	Q V
4+40	0.0514	0.15	Q V
4+45	0.0525	0.15	Q V
4+50	0.0535	0.16	Q V
4+55	0.0546	0.16	Q V
5+ 0	0.0557	0.16	Q V
5+ 5	0.0568	0.16	Q V
5+10	0.0579	0.16	Q V
5+15	0.0589	0.16	Q V
5+20	0.0600	0.16	Q V
5+25	0.0611	0.16	Q V
5+30	0.0622	0.16	Q V
5+35	0.0634	0.16	Q V
5+40	0.0645	0.16	Q V
5+45	0.0656	0.16	Q V
5+50	0.0667	0.16	Q V
5+55	0.0678	0.16	Q V
6+ 0	0.0690	0.16	Q V
6+ 5	0.0701	0.16	Q V
6+10	0.0712	0.17	Q V
6+15	0.0724	0.17	Q V
6+20	0.0735	0.17	Q V
6+25	0.0747	0.17	Q V
6+30	0.0758	0.17	Q V
6+35	0.0770	0.17	Q V
6+40	0.0782	0.17	Q V
6+45	0.0793	0.17	Q V
6+50	0.0805	0.17	Q V
6+55	0.0817	0.17	Q V
7+ 0	0.0829	0.17	Q V
7+ 5	0.0841	0.17	Q V
7+10	0.0853	0.17	Q V
7+15	0.0865	0.17	Q V
7+20	0.0877	0.18	Q V
7+25	0.0889	0.18	Q V
7+30	0.0901	0.18	Q V
7+35	0.0914	0.18	Q V
7+40	0.0926	0.18	Q V
7+45	0.0938	0.18	Q V
7+50	0.0951	0.18	Q V
7+55	0.0963	0.18	Q V
8+ 0	0.0976	0.18	Q V
8+ 5	0.0988	0.18	Q V
8+10	0.1001	0.18	Q V
8+15	0.1014	0.19	Q V
8+20	0.1027	0.19	Q V
8+25	0.1040	0.19	Q V
8+30	0.1053	0.19	Q V
8+35	0.1066	0.19	Q V

8+40	0.1079	0.19	Q V
8+45	0.1092	0.19	Q V
8+50	0.1105	0.19	Q V
8+55	0.1119	0.19	Q V
9+ 0	0.1132	0.19	Q V
9+ 5	0.1145	0.20	Q V
9+10	0.1159	0.20	Q V
9+15	0.1173	0.20	Q V
9+20	0.1186	0.20	Q V
9+25	0.1200	0.20	Q V
9+30	0.1214	0.20	Q V
9+35	0.1228	0.20	Q V
9+40	0.1242	0.20	Q V
9+45	0.1256	0.21	Q V
9+50	0.1270	0.21	Q V
9+55	0.1285	0.21	Q V
10+ 0	0.1299	0.21	Q V
10+ 5	0.1314	0.21	Q V
10+10	0.1328	0.21	Q V
10+15	0.1343	0.21	Q V
10+20	0.1358	0.22	Q V
10+25	0.1373	0.22	Q V
10+30	0.1388	0.22	Q V
10+35	0.1403	0.22	Q V
10+40	0.1418	0.22	Q V
10+45	0.1433	0.22	Q V
10+50	0.1449	0.22	Q V
10+55	0.1465	0.23	Q V
11+ 0	0.1480	0.23	Q V
11+ 5	0.1496	0.23	Q V
11+10	0.1512	0.23	Q V
11+15	0.1528	0.23	Q V
11+20	0.1544	0.24	Q V
11+25	0.1561	0.24	Q V
11+30	0.1577	0.24	Q V
11+35	0.1594	0.24	Q V
11+40	0.1611	0.24	Q V
11+45	0.1628	0.25	Q V
11+50	0.1645	0.25	Q V
11+55	0.1662	0.25	Q V
12+ 0	0.1679	0.25	Q V
12+ 5	0.1697	0.26	Q V
12+10	0.1715	0.26	Q V
12+15	0.1733	0.26	Q V
12+20	0.1751	0.27	Q V
12+25	0.1770	0.27	Q V
12+30	0.1789	0.27	Q V
12+35	0.1808	0.28	Q V
12+40	0.1827	0.28	Q V
12+45	0.1847	0.28	Q V
12+50	0.1867	0.29	Q V
12+55	0.1887	0.29	Q V
13+ 0	0.1907	0.29	Q V
13+ 5	0.1927	0.30	Q V
13+10	0.1948	0.30	Q V
13+15	0.1969	0.31	Q V
13+20	0.1990	0.31	Q V
13+25	0.2012	0.31	Q V
13+30	0.2034	0.32	Q V

```
13+35       0.2056      0.32  |Q        |   V     |         |         |
13+40       0.2079      0.33  |Q        |    V    |         |         |
13+45       0.2102      0.33  |Q        |    V    |         |         |
13+50       0.2125      0.34  |Q        |    V    |         |         |
13+55       0.2149      0.34  |Q        |    V    |         |         |
14+ 0       0.2173      0.35  |Q        |    V    |         |         |
14+ 5       0.2198      0.36  |Q        |    V    |         |         |
14+10       0.2223      0.36  |Q        |     V   |         |         |
14+15       0.2248      0.37  |Q        |     V   |         |         |
14+20       0.2274      0.38  |Q        |     V   |         |         |
14+25       0.2301      0.39  |Q        |     V   |         |         |
14+30       0.2328      0.39  |Q        |     V   |         |         |
14+35       0.2356      0.40  |Q        |      V  |         |         |
14+40       0.2384      0.41  |Q        |      V  |         |         |
14+45       0.2413      0.42  |Q        |      V  |         |         |
14+50       0.2443      0.44  |Q        |      V  |         |         |
14+55       0.2474      0.45  |Q        |      V  |         |         |
15+ 0       0.2506      0.46  |Q        |       V |         |         |
15+ 5       0.2539      0.48  |Q        |       V |         |         |
15+10       0.2573      0.49  |Q        |       V |         |         |
15+15       0.2608      0.51  | Q       |       V |         |         |
15+20       0.2645      0.53  | Q       |        V|         |         |
15+25       0.2683      0.55  | Q       |        V|         |         |
15+30       0.2721      0.55  | Q       |        V|         |         |
15+35       0.2758      0.55  | Q       |        V|         |         |
15+40       0.2797      0.56  | Q       |         V         |         |
15+45       0.2838      0.60  | Q       |         V         |         |
15+50       0.2884      0.66  | Q       |         V         |         |
15+55       0.2936      0.76  |  Q      |         |V        |         |
16+ 0       0.3003      0.97  |  Q      |         |V        |         |
16+ 5       0.3117      1.66  |     Q   |         | V       |         |
16+10       0.3321      2.95  |         |Q        |   V     |         |
16+15       0.3558      3.45  |         |  Q      |    V    |         |
16+20       0.3722      2.38  |        Q|         |     V   |         |
16+25       0.3829      1.54  |     Q   |         |      V  |         |
16+30       0.3912      1.22  |   Q     |         |       V |         |
16+35       0.3985      1.05  |   Q     |         |       V |         |
16+40       0.4048      0.92  |  Q      |         |        V|         |
16+45       0.4105      0.82  |  Q      |         |        V|         |
16+50       0.4155      0.73  | Q       |         |         V         |
16+55       0.4201      0.66  | Q       |         |         V         |
17+ 0       0.4244      0.62  | Q       |         |         V         |
17+ 5       0.4283      0.57  | Q       |         |         V         |
17+10       0.4320      0.53  | Q       |         |         |V        |
17+15       0.4354      0.49  |Q        |         |         |V        |
17+20       0.4386      0.46  |Q        |         |         |V        |
17+25       0.4416      0.43  |Q        |         |         |V        |
17+30       0.4444      0.41  |Q        |         |         | V       |
17+35       0.4472      0.40  |Q        |         |         | V       |
17+40       0.4497      0.37  |Q        |         |         | V       |
17+45       0.4520      0.33  |Q        |         |         | V       |
17+50       0.4542      0.32  |Q        |         |         | V       |
17+55       0.4564      0.31  |Q        |         |         | V       |
18+ 0       0.4584      0.30  |Q        |         |         |  V      |
18+ 5       0.4605      0.30  |Q        |         |         |  V      |
18+10       0.4625      0.29  |Q        |         |         |  V      |
18+15       0.4644      0.28  |Q        |         |         |  V      |
18+20       0.4662      0.27  |Q        |         |         |  V      |
18+25       0.4681      0.27  |Q        |         |         |  V      |
```

18+30	0.4699	0.26	Q			V
18+35	0.4716	0.25	Q			V
18+40	0.4733	0.25	Q			V
18+45	0.4750	0.24	Q			V
18+50	0.4767	0.24	Q			V
18+55	0.4783	0.24	Q			V
19+ 0	0.4799	0.23	Q			V
19+ 5	0.4814	0.23	Q			V
19+10	0.4830	0.22	Q			V
19+15	0.4845	0.22	Q			V
19+20	0.4860	0.22	Q			V
19+25	0.4875	0.21	Q			V
19+30	0.4889	0.21	Q			V
19+35	0.4904	0.21	Q			V
19+40	0.4918	0.21	Q			V
19+45	0.4932	0.20	Q			V
19+50	0.4946	0.20	Q			V
19+55	0.4960	0.20	Q			V
20+ 0	0.4973	0.20	Q			V
20+ 5	0.4987	0.19	Q			V
20+10	0.5000	0.19	Q			V
20+15	0.5013	0.19	Q			V
20+20	0.5026	0.19	Q			V
20+25	0.5039	0.19	Q			V
20+30	0.5051	0.18	Q			V
20+35	0.5064	0.18	Q			V
20+40	0.5076	0.18	Q			V
20+45	0.5089	0.18	Q			V
20+50	0.5101	0.18	Q			V
20+55	0.5113	0.18	Q			V
21+ 0	0.5125	0.17	Q			V
21+ 5	0.5137	0.17	Q			V
21+10	0.5148	0.17	Q			V
21+15	0.5160	0.17	Q			V
21+20	0.5172	0.17	Q			V
21+25	0.5183	0.17	Q			V
21+30	0.5194	0.17	Q			V
21+35	0.5206	0.16	Q			V
21+40	0.5217	0.16	Q			V
21+45	0.5228	0.16	Q			V
21+50	0.5239	0.16	Q			V
21+55	0.5250	0.16	Q			V
22+ 0	0.5261	0.16	Q			V
22+ 5	0.5272	0.16	Q			V
22+10	0.5282	0.16	Q			V
22+15	0.5293	0.15	Q			V
22+20	0.5303	0.15	Q			V
22+25	0.5314	0.15	Q			V
22+30	0.5324	0.15	Q			V
22+35	0.5335	0.15	Q			V
22+40	0.5345	0.15	Q			V
22+45	0.5355	0.15	Q			V
22+50	0.5365	0.15	Q			V
22+55	0.5375	0.15	Q			V
23+ 0	0.5385	0.15	Q			V
23+ 5	0.5395	0.14	Q			V
23+10	0.5405	0.14	Q			V
23+15	0.5415	0.14	Q			V
23+20	0.5425	0.14	Q			V

23+25	0.5434	0.14	Q				V
23+30	0.5444	0.14	Q				V
23+35	0.5454	0.14	Q				V
23+40	0.5463	0.14	Q				V
23+45	0.5473	0.14	Q				V
23+50	0.5482	0.14	Q				V
23+55	0.5491	0.14	Q				V
24+ 0	0.5501	0.14	Q				V
24+ 5	0.5509	0.13	Q				V
24+10	0.5516	0.10	Q				V
24+15	0.5521	0.07	Q				V
24+20	0.5524	0.04	Q				V
24+25	0.5526	0.03	Q				V
24+30	0.5528	0.03	Q				V
24+35	0.5529	0.02	Q				V
24+40	0.5530	0.02	Q				V
24+45	0.5531	0.01	Q				V
24+50	0.5532	0.01	Q				V
24+55	0.5532	0.01	Q				V
25+ 0	0.5533	0.01	Q				V
25+ 5	0.5533	0.00	Q				V
25+10	0.5533	0.00	Q				V
25+15	0.5534	0.00	Q				V
25+20	0.5534	0.00	Q				V
25+25	0.5534	0.00	Q				V
25+30	0.5534	0.00	Q				V
25+35	0.5534	0.00	Q				V

APPENDIX B.4: UNIT HYDROGRAPH ANALYSIS, AREAS "C"

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA C1
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.98	1	1.20
Rainfall data for year 100		
4.98	6	3.00
Rainfall data for year 100		
4.98	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	4.98	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     4.98   1.000         76.0      76.0       3.16     0.563

Area-averaged catchment yield fraction, Y =  0.563
Area-averaged low loss fraction, Yb =  0.437
User entry of time of concentration  =   0.377 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       4.98(Ac.)
Catchment Lag time =   0.302 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 27.6304
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       4.98(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        60.23 (CFS))

  1                2.602                  1.567
  2               11.750                  5.510
  3               27.990                  9.781
  4               47.241                 11.594
  5               61.404                  8.530
  6               69.742                  5.022
  7               74.947                  3.134
  8               78.845                  2.348
  9               81.980                  1.888
 10               84.598                  1.577
 11               86.785                  1.317
 12               88.565                  1.072
 13               90.198                  0.984
 14               91.512                  0.791
```

15	92.683	0.705
16	93.605	0.555
17	94.475	0.524
18	95.306	0.501
19	96.045	0.445
20	96.653	0.366
21	97.196	0.327
22	97.688	0.297
23	98.104	0.250
24	98.478	0.225
25	98.769	0.176
26	99.046	0.166
27	99.322	0.166
28	99.598	0.166
29	100.000	0.083

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1153	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282

42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4820	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177

101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140

160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120

219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106

278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064
34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066

44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081
93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085

103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129
152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147

162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0208
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0404	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0639	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4440	0.0364	0.4076
194	0.0840	0.0364	0.0476
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0175
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141
211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110

221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066
270	0.0116	0.0051	0.0065
271	0.0115	0.0050	0.0065
272	0.0115	0.0050	0.0065
273	0.0114	0.0050	0.0064
274	0.0113	0.0049	0.0064
275	0.0113	0.0049	0.0063
276	0.0112	0.0049	0.0063
277	0.0111	0.0049	0.0063
278	0.0111	0.0048	0.0062
279	0.0110	0.0048	0.0062

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280               0.0109           0.0048               0.0062
281               0.0109           0.0047               0.0061
282               0.0108           0.0047               0.0061
283               0.0107           0.0047               0.0061
284               0.0107           0.0047               0.0060
285               0.0106           0.0046               0.0060
286               0.0106           0.0046               0.0060
287               0.0105           0.0046               0.0059
288               0.0105           0.0046               0.0059
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      2.43(In)
Total effective rainfall =      3.57(In)
Peak flow rate in flood hydrograph =      7.17(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0003      0.04  Q         |         |         |         |
  0+15       0.0010      0.10  Q         |         |         |         |
  0+20       0.0022      0.17  Q         |         |         |         |
  0+25       0.0037      0.22  Q         |         |         |         |
  0+30       0.0054      0.25  Q         |         |         |         |
  0+35       0.0072      0.27  VQ        |         |         |         |
  0+40       0.0092      0.28  VQ        |         |         |         |
  0+45       0.0112      0.29  VQ        |         |         |         |
  0+50       0.0133      0.30  VQ        |         |         |         |
  0+55       0.0154      0.31  VQ        |         |         |         |
  1+ 0       0.0176      0.32  VQ        |         |         |         |
  1+ 5       0.0199      0.33  VQ        |         |         |         |
  1+10       0.0222      0.33  VQ        |         |         |         |
  1+15       0.0245      0.34  VQ        |         |         |         |
  1+20       0.0268      0.34  VQ        |         |         |         |
  1+25       0.0292      0.34  VQ        |         |         |         |
  1+30       0.0316      0.35  VQ        |         |         |         |
  1+35       0.0340      0.35  VQ        |         |         |         |
  1+40       0.0365      0.36  VQ        |         |         |         |
  1+45       0.0389      0.36   |Q       |         |         |         |
  1+50       0.0414      0.36   |Q       |         |         |         |
  1+55       0.0439      0.36   |Q       |         |         |         |
  2+ 0       0.0464      0.37   |Q       |         |         |         |
  2+ 5       0.0490      0.37   |Q       |         |         |         |
  2+10       0.0515      0.37   |Q       |         |         |         |
  2+15       0.0541      0.37   |Q       |         |         |         |
  2+20       0.0567      0.37   |Q       |         |         |         |
  2+25       0.0592      0.38   |Q       |         |         |         |
  2+30       0.0618      0.38   |Q       |         |         |         |
  2+35       0.0644      0.38   |Q       |         |         |         |
  2+40       0.0670      0.38   |Q       |         |         |         |
  2+45       0.0697      0.38   |Q       |         |         |         |
  2+50       0.0723      0.38   |Q       |         |         |         |
  2+55       0.0749      0.38   |QV      |         |         |         |
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3+ 0	0.0776	0.38	QV				
3+ 5	0.0802	0.38	QV				
3+10	0.0829	0.39	QV				
3+15	0.0855	0.39	QV				
3+20	0.0882	0.39	QV				
3+25	0.0909	0.39	QV				
3+30	0.0936	0.39	QV				
3+35	0.0963	0.39	QV				
3+40	0.0990	0.39	QV				
3+45	0.1017	0.39	QV				
3+50	0.1044	0.40	QV				
3+55	0.1072	0.40	QV				
4+ 0	0.1099	0.40	QV				
4+ 5	0.1127	0.40	Q V				
4+10	0.1154	0.40	Q V				
4+15	0.1182	0.40	Q V				
4+20	0.1210	0.40	Q V				
4+25	0.1238	0.41	Q V				
4+30	0.1266	0.41	Q V				
4+35	0.1294	0.41	Q V				
4+40	0.1322	0.41	Q V				
4+45	0.1351	0.41	Q V				
4+50	0.1379	0.41	Q V				
4+55	0.1408	0.41	Q V				
5+ 0	0.1436	0.42	Q V				
5+ 5	0.1465	0.42	Q V				
5+10	0.1494	0.42	Q V				
5+15	0.1523	0.42	Q V				
5+20	0.1552	0.42	Q V				
5+25	0.1581	0.42	Q V				
5+30	0.1610	0.42	Q V				
5+35	0.1640	0.43	Q V				
5+40	0.1669	0.43	Q V				
5+45	0.1699	0.43	Q V				
5+50	0.1728	0.43	Q V				
5+55	0.1758	0.43	Q V				
6+ 0	0.1788	0.43	Q V				
6+ 5	0.1818	0.44	Q V				
6+10	0.1848	0.44	Q V				
6+15	0.1879	0.44	Q V				
6+20	0.1909	0.44	Q V				
6+25	0.1940	0.44	Q V				
6+30	0.1971	0.45	Q V				
6+35	0.2001	0.45	Q V				
6+40	0.2032	0.45	Q V				
6+45	0.2063	0.45	Q V				
6+50	0.2095	0.45	Q V				
6+55	0.2126	0.46	Q V				
7+ 0	0.2157	0.46	Q V				
7+ 5	0.2189	0.46	Q V				
7+10	0.2221	0.46	Q V				
7+15	0.2253	0.46	Q V				
7+20	0.2285	0.47	Q V				
7+25	0.2317	0.47	Q V				
7+30	0.2349	0.47	Q V				
7+35	0.2382	0.47	Q V				
7+40	0.2415	0.47	Q V				
7+45	0.2447	0.48	Q V				
7+50	0.2480	0.48	Q V				

7+55	0.2514	0.48	Q V			
8+ 0	0.2547	0.48	Q V			
8+ 5	0.2580	0.49	Q V			
8+10	0.2614	0.49	Q V			
8+15	0.2648	0.49	Q V			
8+20	0.2682	0.49	Q V			
8+25	0.2716	0.50	Q V			
8+30	0.2750	0.50	Q V			
8+35	0.2785	0.50	Q V			
8+40	0.2819	0.50	Q V			
8+45	0.2854	0.51	Q V			
8+50	0.2889	0.51	Q V			
8+55	0.2925	0.51	Q V			
9+ 0	0.2960	0.51	Q V			
9+ 5	0.2996	0.52	Q V			
9+10	0.3032	0.52	Q V			
9+15	0.3068	0.52	Q V			
9+20	0.3104	0.53	Q V			
9+25	0.3140	0.53	Q V			
9+30	0.3177	0.53	Q V			
9+35	0.3214	0.54	Q V			
9+40	0.3251	0.54	Q V			
9+45	0.3288	0.54	Q V			
9+50	0.3326	0.55	Q V			
9+55	0.3364	0.55	Q V			
10+ 0	0.3402	0.55	Q V			
10+ 5	0.3440	0.56	Q V			
10+10	0.3479	0.56	Q V			
10+15	0.3518	0.56	Q V			
10+20	0.3557	0.57	Q V			
10+25	0.3596	0.57	Q V			
10+30	0.3636	0.58	Q V			
10+35	0.3676	0.58	Q V			
10+40	0.3716	0.58	Q V			
10+45	0.3757	0.59	Q V			
10+50	0.3797	0.59	Q V			
10+55	0.3838	0.60	Q V			
11+ 0	0.3880	0.60	Q V			
11+ 5	0.3922	0.61	Q V			
11+10	0.3964	0.61	Q V			
11+15	0.4006	0.62	Q V			
11+20	0.4049	0.62	Q V			
11+25	0.4092	0.63	Q	V		
11+30	0.4135	0.63	Q	V		
11+35	0.4179	0.64	Q	V		
11+40	0.4223	0.64	Q	V		
11+45	0.4268	0.65	Q	V		
11+50	0.4313	0.65	Q	V		
11+55	0.4358	0.66	Q	V		
12+ 0	0.4404	0.67	Q	V		
12+ 5	0.4450	0.67	Q	V		
12+10	0.4497	0.68	Q	V		
12+15	0.4545	0.69	Q	V		
12+20	0.4593	0.70	Q	V		
12+25	0.4642	0.71	Q	V		
12+30	0.4691	0.72	Q	V		
12+35	0.4741	0.73	Q	V		
12+40	0.4791	0.73	Q	V		
12+45	0.4843	0.74	Q	V		

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12+50       0.4894      0.75  |  Q      |  V      |         |         |
12+55       0.4947      0.76  |  Q      |  V      |         |         |
13+ 0       0.5000      0.77  |  Q      |  V      |         |         |
13+ 5       0.5053      0.78  |  Q      |  V      |         |         |
13+10       0.5108      0.79  |  Q      |  V      |         |         |
13+15       0.5163      0.80  |  Q      |  V      |         |         |
13+20       0.5218      0.81  |  Q      |   V     |         |         |
13+25       0.5275      0.82  |  Q      |   V     |         |         |
13+30       0.5332      0.83  |  Q      |   V     |         |         |
13+35       0.5390      0.84  |  Q      |   V     |         |         |
13+40       0.5449      0.86  |  Q      |   V     |         |         |
13+45       0.5509      0.87  |  Q      |   V     |         |         |
13+50       0.5570      0.88  |  Q      |    V    |         |         |
13+55       0.5631      0.90  |  Q      |    V    |         |         |
14+ 0       0.5694      0.91  |  Q      |    V    |         |         |
14+ 5       0.5758      0.93  |  Q      |    V    |         |         |
14+10       0.5823      0.94  |  Q      |    V    |         |         |
14+15       0.5889      0.96  |  Q      |    V    |         |         |
14+20       0.5957      0.98  |  Q      |     V   |         |         |
14+25       0.6025      1.00  |  Q      |     V   |         |         |
14+30       0.6096      1.02  |   Q     |     V   |         |         |
14+35       0.6167      1.04  |   Q     |     V   |         |         |
14+40       0.6241      1.07  |   Q     |     V   |         |         |
14+45       0.6316      1.09  |   Q     |      V  |         |         |
14+50       0.6393      1.12  |   Q     |      V  |         |         |
14+55       0.6472      1.15  |   Q     |      V  |         |         |
15+ 0       0.6554      1.18  |   Q     |      V  |         |         |
15+ 5       0.6638      1.22  |   Q     |      V  |         |         |
15+10       0.6724      1.26  |    Q    |       V |         |         |
15+15       0.6814      1.30  |    Q    |       V |         |         |
15+20       0.6907      1.35  |    Q    |       V |         |         |
15+25       0.7003      1.40  |    Q    |       V |         |         |
15+30       0.7101      1.43  |    Q    |        V|         |         |
15+35       0.7200      1.44  |    Q    |        V|         |         |
15+40       0.7300      1.45  |    Q    |        V|         |         |
15+45       0.7404      1.51  |     Q   |         V         |         |
15+50       0.7515      1.61  |     Q   |         V         |         |
15+55       0.7639      1.80  |      Q  |         V         |         |
16+ 0       0.7787      2.16  |       Q |         |V        |         |
16+ 5       0.8010      3.23  |         | Q       |V        |         |
16+10       0.8361      5.10  |         |         Q V       |         |
16+15       0.8828      6.78  |         |         |  V   Q  |         |
16+20       0.9322      7.17  |         |         |    V  Q |         |
16+25       0.9714      5.70  |         |         | Q   V   |         |
16+30       0.9998      4.13  |         |     Q   |      V  |         |
16+35       1.0221      3.23  |         | Q       |      V  |         |
16+40       1.0413      2.79  |         |Q        |       V |         |
16+45       1.0586      2.51  |         Q         |       V |         |
16+50       1.0742      2.28  |        Q|         |        V|         |
16+55       1.0885      2.08  |       Q |         |        V|         |
17+ 0       1.1016      1.90  |      Q  |         |        V|         |
17+ 5       1.1139      1.78  |      Q  |         |         V         |
17+10       1.1252      1.64  |     Q   |         |         V         |
17+15       1.1358      1.54  |     Q   |         |         V         |
17+20       1.1456      1.43  |    Q    |         |         |V        |
17+25       1.1550      1.37  |    Q    |         |         |V        |
17+30       1.1641      1.31  |    Q    |         |         |V        |
17+35       1.1726      1.24  |   Q     |         |         |V        |
17+40       1.1807      1.18  |   Q     |         |         |V        |
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17+45	1.1885	1.12	Q			V
17+50	1.1959	1.08	Q			V
17+55	1.2030	1.03	Q			V
18+ 0	1.2097	0.99	Q			V
18+ 5	1.2162	0.94	Q			V
18+10	1.2225	0.91	Q			V
18+15	1.2286	0.88	Q			V
18+20	1.2344	0.85	Q			V
18+25	1.2398	0.79	Q			V
18+30	1.2449	0.74	Q			V
18+35	1.2499	0.72	Q			V
18+40	1.2547	0.70	Q			V
18+45	1.2594	0.69	Q			V
18+50	1.2640	0.67	Q			V
18+55	1.2686	0.66	Q			V
19+ 0	1.2730	0.65	Q			V
19+ 5	1.2774	0.63	Q			V
19+10	1.2817	0.62	Q			V
19+15	1.2859	0.61	Q			V
19+20	1.2900	0.60	Q			V
19+25	1.2941	0.59	Q			V
19+30	1.2982	0.58	Q			V
19+35	1.3021	0.58	Q			V
19+40	1.3060	0.57	Q			V
19+45	1.3099	0.56	Q			V
19+50	1.3137	0.55	Q			V
19+55	1.3174	0.55	Q			V
20+ 0	1.3211	0.54	Q			V
20+ 5	1.3248	0.53	Q			V
20+10	1.3284	0.53	Q			V
20+15	1.3320	0.52	Q			V
20+20	1.3355	0.51	Q			V
20+25	1.3390	0.51	Q			V
20+30	1.3425	0.50	Q			V
20+35	1.3459	0.50	Q			V
20+40	1.3493	0.49	Q			V
20+45	1.3527	0.49	Q			V
20+50	1.3560	0.48	Q			V
20+55	1.3593	0.48	Q			V
21+ 0	1.3625	0.47	Q			V
21+ 5	1.3657	0.47	Q			V
21+10	1.3689	0.46	Q			V
21+15	1.3721	0.46	Q			V
21+20	1.3753	0.46	Q			V
21+25	1.3784	0.45	Q			V
21+30	1.3815	0.45	Q			V
21+35	1.3845	0.44	Q			V
21+40	1.3875	0.44	Q			V
21+45	1.3906	0.44	Q			V
21+50	1.3935	0.43	Q			V
21+55	1.3965	0.43	Q			V
22+ 0	1.3994	0.43	Q			V
22+ 5	1.4024	0.42	Q			V
22+10	1.4053	0.42	Q			V
22+15	1.4081	0.42	Q			V
22+20	1.4110	0.41	Q			V
22+25	1.4138	0.41	Q			V
22+30	1.4166	0.41	Q			V
22+35	1.4194	0.41	Q			V

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  22+40        1.4222      0.40   |Q          |          |          |        V |
  22+45        1.4250      0.40   |Q          |          |          |        V |
  22+50        1.4277      0.40   |Q          |          |          |        V |
  22+55        1.4304      0.39   |Q          |          |          |        V |
  23+ 0        1.4331      0.39   |Q          |          |          |        V |
  23+ 5        1.4358      0.39   |Q          |          |          |        V |
  23+10        1.4385      0.39   |Q          |          |          |        V |
  23+15        1.4411      0.38   |Q          |          |          |         V|
  23+20        1.4438      0.38   |Q          |          |          |         V|
  23+25        1.4464      0.38   |Q          |          |          |         V|
  23+30        1.4490      0.38   |Q          |          |          |         V|
  23+35        1.4516      0.38   |Q          |          |          |         V|
  23+40        1.4541      0.37   |Q          |          |          |         V|
  23+45        1.4567      0.37   |Q          |          |          |         V|
  23+50        1.4592      0.37   |Q          |          |          |         V|
  23+55        1.4618      0.37   |Q          |          |          |         V|
  24+ 0        1.4643      0.36   |Q          |          |          |         V|
  24+ 5        1.4667      0.35   |Q          |          |          |         V|
  24+10        1.4689      0.32   |Q          |          |          |         V|
  24+15        1.4707      0.26   |Q          |          |          |         V|
  24+20        1.4720      0.19   Q           |          |          |         V|
  24+25        1.4730      0.14   Q           |          |          |         V|
  24+30        1.4737      0.11   Q           |          |          |         V|
  24+35        1.4744      0.09   Q           |          |          |         V|
  24+40        1.4749      0.08   Q           |          |          |         V|
  24+45        1.4753      0.06   Q           |          |          |         V|
  24+50        1.4757      0.06   Q           |          |          |         V|
  24+55        1.4761      0.05   Q           |          |          |         V|
  25+ 0        1.4763      0.04   Q           |          |          |         V|
  25+ 5        1.4766      0.03   Q           |          |          |         V|
  25+10        1.4768      0.03   Q           |          |          |         V|
  25+15        1.4770      0.03   Q           |          |          |         V|
  25+20        1.4771      0.02   Q           |          |          |         V|
  25+25        1.4772      0.02   Q           |          |          |         V|
  25+30        1.4774      0.02   Q           |          |          |         V|
  25+35        1.4774      0.01   Q           |          |          |         V|
  25+40        1.4775      0.01   Q           |          |          |         V|
  25+45        1.4776      0.01   Q           |          |          |         V|
  25+50        1.4776      0.01   Q           |          |          |         V|
  25+55        1.4777      0.01   Q           |          |          |         V|
  26+ 0        1.4777      0.00   Q           |          |          |         V|
  26+ 5        1.4777      0.00   Q           |          |          |         V|
  26+10        1.4777      0.00   Q           |          |          |         V|
  26+15        1.4778      0.00   Q           |          |          |         V|
  26+20        1.4778      0.00   Q           |          |          |          V
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U n i t   H y d r o g r a p h   A n a l y s i s

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Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
PRE-PROJECT - AREA C2
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
3.47	1	1.20
Rainfall data for year 100		
3.47	6	3.00
Rainfall data for year 100		
3.47	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
76.0	76.0	3.47	1.000	0.437	1.000	0.437

Area-averaged adjusted loss rate Fm (In/Hr) = 0.437

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
3.47	1.000	76.0	76.0	3.16	0.563

Area-averaged catchment yield fraction, Y = 0.563
Area-averaged low loss fraction, Yb = 0.437
User entry of time of concentration =   0.507 (hours)
++
Watershed area =   3.47(Ac.)
Catchment Lag time =   0.406 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 20.5457
Hydrograph baseflow =   0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.437(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of   3.47(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000   Adjusted rainfall = 0.444(In)
30-minute factor = 1.000   Adjusted rainfall = 0.909(In)
1-hour factor = 1.000   Adjusted rainfall = 1.200(In)
3-hour factor = 1.000   Adjusted rainfall = 2.105(In)
6-hour factor = 1.000   Adjusted rainfall = 3.000(In)
24-hour factor = 1.000   Adjusted rainfall = 6.000(In)

U n i t   H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 41.97 (CFS))	
1	1.831	0.768
2	7.243	2.271
3	16.699	3.968
4	29.880	5.532
5	44.533	6.149
6	56.653	5.086
7	64.711	3.381
8	70.287	2.340
9	74.186	1.636
10	77.267	1.293
11	79.887	1.100
12	82.128	0.940
13	84.097	0.826
14	85.846	0.734

15	87.330	0.623
16	88.607	0.536
17	89.840	0.517
18	90.920	0.453
19	91.824	0.379
20	92.693	0.365
21	93.378	0.287
22	94.035	0.276
23	94.668	0.266
24	95.285	0.259
25	95.865	0.243
26	96.326	0.194
27	96.776	0.189
28	97.170	0.165
29	97.540	0.155
30	97.884	0.144
31	98.173	0.121
32	98.455	0.118
33	98.677	0.093
34	98.883	0.086
35	99.088	0.086
36	99.294	0.086
37	99.499	0.086
38	99.705	0.086
39	100.000	0.043

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722
6	0.9093	0.0640
7	0.9671	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1154	0.0460
11	1.1588	0.0433
12	1.1998	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3449	0.0466
16	1.3900	0.0451
17	1.4338	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6359	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324

32	1.9815	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6140	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187

91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145

150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123

209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108

268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0046	0.0059
2	0.0104	0.0046	0.0059
3	0.0105	0.0046	0.0059
4	0.0105	0.0046	0.0059
5	0.0105	0.0046	0.0059
6	0.0106	0.0046	0.0059
7	0.0106	0.0046	0.0060
8	0.0106	0.0046	0.0060
9	0.0107	0.0047	0.0060
10	0.0107	0.0047	0.0060
11	0.0107	0.0047	0.0060
12	0.0107	0.0047	0.0060
13	0.0108	0.0047	0.0061
14	0.0108	0.0047	0.0061
15	0.0108	0.0047	0.0061
16	0.0108	0.0047	0.0061
17	0.0109	0.0048	0.0061
18	0.0109	0.0048	0.0061
19	0.0110	0.0048	0.0062
20	0.0110	0.0048	0.0062
21	0.0110	0.0048	0.0062
22	0.0110	0.0048	0.0062
23	0.0111	0.0048	0.0062
24	0.0111	0.0048	0.0063
25	0.0111	0.0049	0.0063
26	0.0112	0.0049	0.0063
27	0.0112	0.0049	0.0063
28	0.0112	0.0049	0.0063
29	0.0113	0.0049	0.0064
30	0.0113	0.0049	0.0064
31	0.0114	0.0050	0.0064
32	0.0114	0.0050	0.0064
33	0.0114	0.0050	0.0064

34	0.0114	0.0050	0.0064
35	0.0115	0.0050	0.0065
36	0.0115	0.0050	0.0065
37	0.0116	0.0051	0.0065
38	0.0116	0.0051	0.0065
39	0.0116	0.0051	0.0066
40	0.0117	0.0051	0.0066
41	0.0117	0.0051	0.0066
42	0.0117	0.0051	0.0066
43	0.0118	0.0052	0.0066
44	0.0118	0.0052	0.0067
45	0.0119	0.0052	0.0067
46	0.0119	0.0052	0.0067
47	0.0120	0.0052	0.0067
48	0.0120	0.0052	0.0068
49	0.0120	0.0053	0.0068
50	0.0121	0.0053	0.0068
51	0.0121	0.0053	0.0068
52	0.0122	0.0053	0.0068
53	0.0122	0.0053	0.0069
54	0.0122	0.0053	0.0069
55	0.0123	0.0054	0.0069
56	0.0123	0.0054	0.0069
57	0.0124	0.0054	0.0070
58	0.0124	0.0054	0.0070
59	0.0125	0.0055	0.0070
60	0.0125	0.0055	0.0071
61	0.0126	0.0055	0.0071
62	0.0126	0.0055	0.0071
63	0.0127	0.0055	0.0071
64	0.0127	0.0055	0.0072
65	0.0128	0.0056	0.0072
66	0.0128	0.0056	0.0072
67	0.0129	0.0056	0.0073
68	0.0129	0.0056	0.0073
69	0.0130	0.0057	0.0073
70	0.0130	0.0057	0.0073
71	0.0131	0.0057	0.0074
72	0.0131	0.0057	0.0074
73	0.0132	0.0058	0.0074
74	0.0132	0.0058	0.0075
75	0.0133	0.0058	0.0075
76	0.0133	0.0058	0.0075
77	0.0134	0.0059	0.0076
78	0.0135	0.0059	0.0076
79	0.0135	0.0059	0.0076
80	0.0136	0.0059	0.0076
81	0.0137	0.0060	0.0077
82	0.0137	0.0060	0.0077
83	0.0138	0.0060	0.0078
84	0.0138	0.0060	0.0078
85	0.0139	0.0061	0.0078
86	0.0140	0.0061	0.0079
87	0.0140	0.0061	0.0079
88	0.0141	0.0062	0.0079
89	0.0142	0.0062	0.0080
90	0.0142	0.0062	0.0080
91	0.0143	0.0063	0.0081
92	0.0144	0.0063	0.0081

93	0.0145	0.0063	0.0081
94	0.0145	0.0063	0.0082
95	0.0146	0.0064	0.0082
96	0.0147	0.0064	0.0083
97	0.0148	0.0064	0.0083
98	0.0148	0.0065	0.0083
99	0.0149	0.0065	0.0084
100	0.0150	0.0065	0.0084
101	0.0151	0.0066	0.0085
102	0.0151	0.0066	0.0085
103	0.0152	0.0067	0.0086
104	0.0153	0.0067	0.0086
105	0.0154	0.0067	0.0087
106	0.0155	0.0068	0.0087
107	0.0156	0.0068	0.0088
108	0.0157	0.0068	0.0088
109	0.0158	0.0069	0.0089
110	0.0158	0.0069	0.0089
111	0.0160	0.0070	0.0090
112	0.0160	0.0070	0.0090
113	0.0162	0.0071	0.0091
114	0.0162	0.0071	0.0091
115	0.0164	0.0072	0.0092
116	0.0164	0.0072	0.0093
117	0.0166	0.0072	0.0093
118	0.0167	0.0073	0.0094
119	0.0168	0.0073	0.0095
120	0.0169	0.0074	0.0095
121	0.0170	0.0074	0.0096
122	0.0171	0.0075	0.0097
123	0.0173	0.0076	0.0097
124	0.0174	0.0076	0.0098
125	0.0175	0.0077	0.0099
126	0.0176	0.0077	0.0099
127	0.0178	0.0078	0.0100
128	0.0179	0.0078	0.0101
129	0.0181	0.0079	0.0102
130	0.0182	0.0079	0.0102
131	0.0184	0.0080	0.0104
132	0.0185	0.0081	0.0104
133	0.0187	0.0082	0.0105
134	0.0188	0.0082	0.0106
135	0.0190	0.0083	0.0107
136	0.0191	0.0083	0.0108
137	0.0193	0.0084	0.0109
138	0.0195	0.0085	0.0110
139	0.0197	0.0086	0.0111
140	0.0198	0.0087	0.0112
141	0.0201	0.0088	0.0113
142	0.0202	0.0088	0.0114
143	0.0205	0.0089	0.0115
144	0.0206	0.0090	0.0116
145	0.0214	0.0093	0.0120
146	0.0215	0.0094	0.0121
147	0.0218	0.0095	0.0123
148	0.0220	0.0096	0.0124
149	0.0223	0.0097	0.0126
150	0.0225	0.0098	0.0127
151	0.0228	0.0100	0.0129

152	0.0230	0.0100	0.0130
153	0.0234	0.0102	0.0132
154	0.0236	0.0103	0.0133
155	0.0240	0.0105	0.0135
156	0.0242	0.0106	0.0136
157	0.0246	0.0108	0.0139
158	0.0249	0.0109	0.0140
159	0.0253	0.0111	0.0143
160	0.0256	0.0112	0.0144
161	0.0261	0.0114	0.0147
162	0.0264	0.0115	0.0149
163	0.0270	0.0118	0.0152
164	0.0273	0.0119	0.0154
165	0.0279	0.0122	0.0157
166	0.0282	0.0123	0.0159
167	0.0289	0.0126	0.0163
168	0.0293	0.0128	0.0165
169	0.0301	0.0131	0.0170
170	0.0305	0.0133	0.0172
171	0.0314	0.0137	0.0177
172	0.0319	0.0139	0.0180
173	0.0330	0.0144	0.0186
174	0.0335	0.0146	0.0189
175	0.0347	0.0152	0.0196
176	0.0354	0.0155	0.0199
177	0.0368	0.0161	0.0207
178	0.0376	0.0164	0.0212
179	0.0394	0.0172	0.0222
180	0.0403	0.0176	0.0227
181	0.0425	0.0186	0.0240
182	0.0438	0.0191	0.0247
183	0.0466	0.0204	0.0263
184	0.0483	0.0211	0.0272
185	0.0410	0.0179	0.0231
186	0.0433	0.0189	0.0244
187	0.0492	0.0215	0.0277
188	0.0531	0.0232	0.0299
189	0.0640	0.0279	0.0360
190	0.0722	0.0315	0.0407
191	0.1032	0.0364	0.0668
192	0.1419	0.0364	0.1055
193	0.4441	0.0364	0.4077
194	0.0840	0.0364	0.0477
195	0.0578	0.0253	0.0326
196	0.0460	0.0201	0.0259
197	0.0501	0.0219	0.0282
198	0.0451	0.0197	0.0254
199	0.0414	0.0181	0.0233
200	0.0385	0.0168	0.0217
201	0.0361	0.0158	0.0203
202	0.0341	0.0149	0.0192
203	0.0324	0.0142	0.0183
204	0.0310	0.0135	0.0174
205	0.0297	0.0130	0.0167
206	0.0286	0.0125	0.0161
207	0.0276	0.0120	0.0155
208	0.0267	0.0116	0.0150
209	0.0258	0.0113	0.0146
210	0.0251	0.0110	0.0141

211	0.0244	0.0107	0.0138
212	0.0238	0.0104	0.0134
213	0.0232	0.0101	0.0131
214	0.0227	0.0099	0.0128
215	0.0222	0.0097	0.0125
216	0.0217	0.0095	0.0122
217	0.0208	0.0091	0.0117
218	0.0203	0.0089	0.0115
219	0.0200	0.0087	0.0112
220	0.0196	0.0086	0.0110
221	0.0192	0.0084	0.0108
222	0.0189	0.0083	0.0106
223	0.0186	0.0081	0.0105
224	0.0183	0.0080	0.0103
225	0.0180	0.0079	0.0101
226	0.0177	0.0077	0.0100
227	0.0175	0.0076	0.0098
228	0.0172	0.0075	0.0097
229	0.0170	0.0074	0.0096
230	0.0167	0.0073	0.0094
231	0.0165	0.0072	0.0093
232	0.0163	0.0071	0.0092
233	0.0161	0.0070	0.0091
234	0.0159	0.0069	0.0090
235	0.0157	0.0069	0.0089
236	0.0155	0.0068	0.0088
237	0.0154	0.0067	0.0087
238	0.0152	0.0066	0.0086
239	0.0150	0.0066	0.0085
240	0.0149	0.0065	0.0084
241	0.0147	0.0064	0.0083
242	0.0146	0.0064	0.0082
243	0.0144	0.0063	0.0081
244	0.0143	0.0062	0.0080
245	0.0141	0.0062	0.0080
246	0.0140	0.0061	0.0079
247	0.0139	0.0061	0.0078
248	0.0137	0.0060	0.0077
249	0.0136	0.0059	0.0077
250	0.0135	0.0059	0.0076
251	0.0134	0.0058	0.0075
252	0.0133	0.0058	0.0075
253	0.0132	0.0057	0.0074
254	0.0130	0.0057	0.0074
255	0.0129	0.0057	0.0073
256	0.0128	0.0056	0.0072
257	0.0127	0.0056	0.0072
258	0.0126	0.0055	0.0071
259	0.0125	0.0055	0.0071
260	0.0125	0.0054	0.0070
261	0.0124	0.0054	0.0070
262	0.0123	0.0054	0.0069
263	0.0122	0.0053	0.0069
264	0.0121	0.0053	0.0068
265	0.0120	0.0052	0.0068
266	0.0119	0.0052	0.0067
267	0.0119	0.0052	0.0067
268	0.0118	0.0051	0.0066
269	0.0117	0.0051	0.0066

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    270              0.0116           0.0051             0.0065
    271              0.0115           0.0050             0.0065
    272              0.0115           0.0050             0.0065
    273              0.0114           0.0050             0.0064
    274              0.0113           0.0049             0.0064
    275              0.0113           0.0049             0.0063
    276              0.0112           0.0049             0.0063
    277              0.0111           0.0049             0.0063
    278              0.0111           0.0048             0.0062
    279              0.0110           0.0048             0.0062
    280              0.0109           0.0048             0.0062
    281              0.0109           0.0047             0.0061
    282              0.0108           0.0047             0.0061
    283              0.0107           0.0047             0.0061
    284              0.0107           0.0047             0.0060
    285              0.0106           0.0046             0.0060
    286              0.0106           0.0046             0.0060
    287              0.0105           0.0046             0.0059
    288              0.0105           0.0046             0.0059
    --------------------------------------------------------------------
    --------------------------------------------------------------------
    Total soil rain loss =      2.43(In)
    Total effective rainfall =      3.57(In)
    Peak flow rate in flood hydrograph =      4.15(CFS)
    ---------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R   S T O R M
                   R u n o f f     H y d r o g r a p h
    --------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    --------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q         |         |         |         |
  0+10       0.0002      0.02  Q         |         |         |         |
  0+15       0.0004      0.04  Q         |         |         |         |
  0+20       0.0009      0.07  Q         |         |         |         |
  0+25       0.0017      0.11  Q         |         |         |         |
  0+30       0.0027      0.14  Q         |         |         |         |
  0+35       0.0038      0.16  Q         |         |         |         |
  0+40       0.0050      0.17  Q         |         |         |         |
  0+45       0.0062      0.18  Q         |         |         |         |
  0+50       0.0076      0.19  Q         |         |         |         |
  0+55       0.0090      0.20  Q         |         |         |         |
  1+ 0       0.0104      0.21  Q         |         |         |         |
  1+ 5       0.0118      0.21  Q         |         |         |         |
  1+10       0.0133      0.22  Q         |         |         |         |
  1+15       0.0148      0.22  Q         |         |         |         |
  1+20       0.0164      0.22  Q         |         |         |         |
  1+25       0.0179      0.23  Q         |         |         |         |
  1+30       0.0195      0.23  Q         |         |         |         |
  1+35       0.0211      0.23  Q         |         |         |         |
  1+40       0.0228      0.24  Q         |         |         |         |
  1+45       0.0244      0.24  Q         |         |         |         |
  1+50       0.0261      0.24  QV        |         |         |         |
  1+55       0.0278      0.24  QV        |         |         |         |
  2+ 0       0.0295      0.25  QV        |         |         |         |
  2+ 5       0.0312      0.25  QV        |         |         |         |
```

2+10	0.0329	0.25	QV
2+15	0.0346	0.25	Q
2+20	0.0364	0.25	Q
2+25	0.0381	0.25	Q
2+30	0.0399	0.26	Q
2+35	0.0417	0.26	Q
2+40	0.0434	0.26	Q
2+45	0.0452	0.26	Q
2+50	0.0470	0.26	Q
2+55	0.0489	0.26	Q
3+ 0	0.0507	0.26	Q
3+ 5	0.0525	0.27	QV
3+10	0.0544	0.27	QV
3+15	0.0562	0.27	QV
3+20	0.0581	0.27	QV
3+25	0.0599	0.27	QV
3+30	0.0618	0.27	QV
3+35	0.0637	0.27	QV
3+40	0.0655	0.27	QV
3+45	0.0674	0.27	QV
3+50	0.0693	0.27	QV
3+55	0.0712	0.28	QV
4+ 0	0.0731	0.28	QV
4+ 5	0.0750	0.28	QV
4+10	0.0769	0.28	QV
4+15	0.0789	0.28	Q V
4+20	0.0808	0.28	Q V
4+25	0.0827	0.28	Q V
4+30	0.0847	0.28	Q V
4+35	0.0866	0.28	Q V
4+40	0.0886	0.28	Q V
4+45	0.0905	0.28	Q V
4+50	0.0925	0.29	Q V
4+55	0.0945	0.29	Q V
5+ 0	0.0965	0.29	Q V
5+ 5	0.0985	0.29	Q V
5+10	0.1005	0.29	Q V
5+15	0.1025	0.29	Q V
5+20	0.1045	0.29	Q V
5+25	0.1065	0.29	Q V
5+30	0.1085	0.29	Q V
5+35	0.1106	0.30	Q V
5+40	0.1126	0.30	Q V
5+45	0.1146	0.30	Q V
5+50	0.1167	0.30	Q V
5+55	0.1188	0.30	Q V
6+ 0	0.1208	0.30	Q V
6+ 5	0.1229	0.30	Q V
6+10	0.1250	0.30	Q V
6+15	0.1271	0.30	Q V
6+20	0.1292	0.31	Q V
6+25	0.1313	0.31	Q V
6+30	0.1335	0.31	Q V
6+35	0.1356	0.31	Q V
6+40	0.1377	0.31	Q V
6+45	0.1399	0.31	Q V
6+50	0.1421	0.31	Q V
6+55	0.1442	0.32	Q V
7+ 0	0.1464	0.32	Q V

```
 7+ 5       0.1486      0.32   |Q   V    |         |         |         |
 7+10       0.1508      0.32   |Q   V    |         |         |         |
 7+15       0.1530      0.32   |Q   V    |         |         |         |
 7+20       0.1552      0.32   |Q    V   |         |         |         |
 7+25       0.1574      0.32   |Q    V   |         |         |         |
 7+30       0.1597      0.32   |Q    V   |         |         |         |
 7+35       0.1619      0.33   |Q    V   |         |         |         |
 7+40       0.1642      0.33   |Q    V   |         |         |         |
 7+45       0.1665      0.33   |Q    V   |         |         |         |
 7+50       0.1687      0.33   |Q    V   |         |         |         |
 7+55       0.1710      0.33   |Q    V   |         |         |         |
 8+ 0       0.1733      0.33   |Q    V   |         |         |         |
 8+ 5       0.1757      0.34   |Q    V   |         |         |         |
 8+10       0.1780      0.34   |Q    V   |         |         |         |
 8+15       0.1803      0.34   |Q    V   |         |         |         |
 8+20       0.1827      0.34   |Q     V  |         |         |         |
 8+25       0.1850      0.34   |Q     V  |         |         |         |
 8+30       0.1874      0.34   |Q     V  |         |         |         |
 8+35       0.1898      0.35   |Q     V  |         |         |         |
 8+40       0.1922      0.35   |Q     V  |         |         |         |
 8+45       0.1946      0.35   |Q     V  |         |         |         |
 8+50       0.1970      0.35   |Q     V  |         |         |         |
 8+55       0.1994      0.35   |Q     V  |         |         |         |
 9+ 0       0.2019      0.36   |Q     V  |         |         |         |
 9+ 5       0.2044      0.36   |Q     V  |         |         |         |
 9+10       0.2068      0.36   |Q      V |         |         |         |
 9+15       0.2093      0.36   |Q      V |         |         |         |
 9+20       0.2118      0.36   |Q      V |         |         |         |
 9+25       0.2143      0.37   |Q      V |         |         |         |
 9+30       0.2169      0.37   |Q      V |         |         |         |
 9+35       0.2194      0.37   |Q      V |         |         |         |
 9+40       0.2220      0.37   |Q      V |         |         |         |
 9+45       0.2246      0.37   |Q      V |         |         |         |
 9+50       0.2272      0.38   |Q      V |         |         |         |
 9+55       0.2298      0.38   |Q      V |         |         |         |
10+ 0       0.2324      0.38   |Q       V|         |         |         |
10+ 5       0.2350      0.38   |Q       V|         |         |         |
10+10       0.2377      0.39   |Q       V|         |         |         |
10+15       0.2404      0.39   |Q       V|         |         |         |
10+20       0.2431      0.39   |Q       V|         |         |         |
10+25       0.2458      0.39   |Q       V|         |         |         |
10+30       0.2485      0.40   |Q       V|         |         |         |
10+35       0.2513      0.40   |Q       V|         |         |         |
10+40       0.2540      0.40   |Q       V|         |         |         |
10+45       0.2568      0.41   |Q       V|         |         |         |
10+50       0.2596      0.41   |Q        V         |         |         |
10+55       0.2625      0.41   |Q        V         |         |         |
11+ 0       0.2653      0.41   |Q        V         |         |         |
11+ 5       0.2682      0.42   |Q        V         |         |         |
11+10       0.2711      0.42   |Q        V         |         |         |
11+15       0.2740      0.42   |Q        V         |         |         |
11+20       0.2769      0.43   |Q        V         |         |         |
11+25       0.2799      0.43   |Q        V         |         |         |
11+30       0.2829      0.43   |Q        V         |         |         |
11+35       0.2859      0.44   |Q        |V        |         |         |
11+40       0.2889      0.44   |Q        |V        |         |         |
11+45       0.2920      0.44   |Q        |V        |         |         |
11+50       0.2951      0.45   |Q        |V        |         |         |
11+55       0.2982      0.45   |Q        |V        |         |         |
```

```
12+ 0       0.3014      0.46  |Q        |V        |         |         |
12+ 5       0.3045      0.46  |Q        |V        |         |         |
12+10       0.3078      0.47  |Q        |V        |         |         |
12+15       0.3110      0.47  |Q        | V       |         |         |
12+20       0.3143      0.48  |Q        | V       |         |         |
12+25       0.3176      0.48  |Q        | V       |         |         |
12+30       0.3210      0.49  |Q        | V       |         |         |
12+35       0.3244      0.50  |Q        | V       |         |         |
12+40       0.3279      0.50  | Q       | V       |         |         |
12+45       0.3314      0.51  | Q       | V       |         |         |
12+50       0.3349      0.51  | Q       |  V      |         |         |
12+55       0.3385      0.52  | Q       |  V      |         |         |
13+ 0       0.3421      0.53  | Q       |  V      |         |         |
13+ 5       0.3458      0.53  | Q       |  V      |         |         |
13+10       0.3495      0.54  | Q       |  V      |         |         |
13+15       0.3532      0.55  | Q       |  V      |         |         |
13+20       0.3570      0.55  | Q       |  V      |         |         |
13+25       0.3609      0.56  | Q       |   V     |         |         |
13+30       0.3648      0.57  | Q       |   V     |         |         |
13+35       0.3688      0.57  | Q       |   V     |         |         |
13+40       0.3728      0.58  | Q       |   V     |         |         |
13+45       0.3769      0.59  | Q       |   V     |         |         |
13+50       0.3810      0.60  | Q       |   V     |         |         |
13+55       0.3852      0.61  | Q       |   V     |         |         |
14+ 0       0.3895      0.62  | Q       |    V    |         |         |
14+ 5       0.3938      0.63  | Q       |    V    |         |         |
14+10       0.3982      0.64  | Q       |    V    |         |         |
14+15       0.4027      0.65  | Q       |    V    |         |         |
14+20       0.4073      0.66  | Q       |    V    |         |         |
14+25       0.4119      0.68  | Q       |    V    |         |         |
14+30       0.4167      0.69  | Q       |     V   |         |         |
14+35       0.4215      0.70  | Q       |     V   |         |         |
14+40       0.4265      0.72  | Q       |     V   |         |         |
14+45       0.4315      0.74  | Q       |     V   |         |         |
14+50       0.4367      0.75  |  Q      |     V   |         |         |
14+55       0.4420      0.77  |  Q      |      V  |         |         |
15+ 0       0.4475      0.79  |  Q      |      V  |         |         |
15+ 5       0.4531      0.82  |  Q      |      V  |         |         |
15+10       0.4589      0.84  |  Q      |      V  |         |         |
15+15       0.4649      0.87  |  Q      |       V |         |         |
15+20       0.4710      0.90  |  Q      |       V |         |         |
15+25       0.4774      0.93  |  Q      |       V |         |         |
15+30       0.4840      0.95  |  Q      |       V |         |         |
15+35       0.4907      0.97  |  Q      |        V|         |         |
15+40       0.4975      0.99  |  Q      |        V|         |         |
15+45       0.5044      1.01  |   Q     |        V|         |         |
15+50       0.5117      1.06  |   Q     |        V|         |         |
15+55       0.5196      1.15  |   Q     |         V         |         |
16+ 0       0.5287      1.32  |    Q    |         V         |         |
16+ 5       0.5414      1.84  |      Q  |         |V        |         |
16+10       0.5594      2.62  |         Q         |V        |         |
16+15       0.5830      3.43  |         |  Q      | V       |         |
16+20       0.6108      4.04  |         |     Q   |  V      |         |
16+25       0.6394      4.15  |         |     Q   |   V     |         |
16+30       0.6641      3.58  |         |   Q     |    V    |         |
16+35       0.6833      2.80  |         |Q        |     V   |         |
16+40       0.6990      2.28  |        Q|         |      V  |         |
16+45       0.7123      1.92  |      Q  |         |      V  |         |
16+50       0.7242      1.72  |     Q   |         |       V |         |
```

16+55	0.7350	1.58	Q		V	
17+ 0	0.7451	1.46	Q		V	
17+ 5	0.7545	1.36	Q		V	
17+10	0.7632	1.27	Q		V	
17+15	0.7714	1.19	Q		V	
17+20	0.7791	1.11	Q		V	
17+25	0.7864	1.07	Q		V	
17+30	0.7934	1.01	Q		V	
17+35	0.7999	0.95	Q			V
17+40	0.8062	0.91	Q			V
17+45	0.8121	0.86	Q			V
17+50	0.8178	0.83	Q			V
17+55	0.8234	0.80	Q			V
18+ 0	0.8287	0.78	Q			V
18+ 5	0.8339	0.75	Q			V
18+10	0.8388	0.71	Q			V
18+15	0.8436	0.69	Q			V
18+20	0.8482	0.67	Q			V
18+25	0.8526	0.64	Q			V
18+30	0.8569	0.62	Q			V
18+35	0.8611	0.60	Q			V
18+40	0.8651	0.58	Q			V
18+45	0.8689	0.56	Q			V
18+50	0.8727	0.55	Q			V
18+55	0.8764	0.53	Q			V
19+ 0	0.8800	0.52	Q			V
19+ 5	0.8835	0.51	Q			V
19+10	0.8870	0.50	Q			V
19+15	0.8902	0.47	Q			V
19+20	0.8932	0.44	Q			V
19+25	0.8962	0.43	Q			V
19+30	0.8992	0.43	Q			V
19+35	0.9021	0.42	Q			V
19+40	0.9049	0.41	Q			V
19+45	0.9077	0.41	Q			V
19+50	0.9105	0.40	Q			V
19+55	0.9132	0.39	Q			V
20+ 0	0.9158	0.39	Q			V
20+ 5	0.9185	0.38	Q			V
20+10	0.9211	0.38	Q			V
20+15	0.9237	0.37	Q			V
20+20	0.9262	0.37	Q			V
20+25	0.9287	0.36	Q			V
20+30	0.9312	0.36	Q			V
20+35	0.9336	0.36	Q			V
20+40	0.9361	0.35	Q			V
20+45	0.9385	0.35	Q			V
20+50	0.9408	0.34	Q			V
20+55	0.9432	0.34	Q			V
21+ 0	0.9455	0.34	Q			V
21+ 5	0.9478	0.33	Q			V
21+10	0.9501	0.33	Q			V
21+15	0.9523	0.33	Q			V
21+20	0.9546	0.32	Q			V
21+25	0.9568	0.32	Q			V
21+30	0.9590	0.32	Q			V
21+35	0.9611	0.32	Q			V
21+40	0.9633	0.31	Q			V
21+45	0.9654	0.31	Q			V

21+50	0.9676	0.31	Q			V
21+55	0.9697	0.31	Q			V
22+ 0	0.9718	0.30	Q			V
22+ 5	0.9738	0.30	Q			V
22+10	0.9759	0.30	Q			V
22+15	0.9779	0.30	Q			V
22+20	0.9799	0.29	Q			V
22+25	0.9819	0.29	Q			V
22+30	0.9839	0.29	Q			V
22+35	0.9859	0.29	Q			V
22+40	0.9879	0.29	Q			V
22+45	0.9898	0.28	Q			V
22+50	0.9918	0.28	Q			V
22+55	0.9937	0.28	Q			V
23+ 0	0.9956	0.28	Q			V
23+ 5	0.9975	0.28	Q			V
23+10	0.9994	0.27	Q			V
23+15	1.0013	0.27	Q			V
23+20	1.0031	0.27	Q			V
23+25	1.0050	0.27	Q			V
23+30	1.0068	0.27	Q			V
23+35	1.0086	0.27	Q			V
23+40	1.0104	0.26	Q			V
23+45	1.0123	0.26	Q			V
23+50	1.0140	0.26	Q			V
23+55	1.0158	0.26	Q			V
24+ 0	1.0176	0.26	Q			V
24+ 5	1.0193	0.25	Q			V
24+10	1.0210	0.24	Q			V
24+15	1.0224	0.21	Q			V
24+20	1.0237	0.18	Q			V
24+25	1.0246	0.14	Q			V
24+30	1.0254	0.11	Q			V
24+35	1.0260	0.09	Q			V
24+40	1.0265	0.08	Q			V
24+45	1.0270	0.07	Q			V
24+50	1.0274	0.06	Q			V
24+55	1.0278	0.05	Q			V
25+ 0	1.0281	0.05	Q			V
25+ 5	1.0284	0.04	Q			V
25+10	1.0286	0.04	Q			V
25+15	1.0288	0.03	Q			V
25+20	1.0290	0.03	Q			V
25+25	1.0292	0.03	Q			V
25+30	1.0294	0.02	Q			V
25+35	1.0295	0.02	Q			V
25+40	1.0296	0.02	Q			V
25+45	1.0297	0.02	Q			V
25+50	1.0298	0.01	Q			V
25+55	1.0299	0.01	Q			V
26+ 0	1.0300	0.01	Q			V
26+ 5	1.0301	0.01	Q			V
26+10	1.0301	0.01	Q			V
26+15	1.0302	0.01	Q			V
26+20	1.0302	0.01	Q			V
26+25	1.0303	0.01	Q			V
26+30	1.0303	0.00	Q			V
26+35	1.0303	0.00	Q			V
26+40	1.0304	0.00	Q			V

```
   26+45        1.0304       0.00  Q         |         |         |        V|
   26+50        1.0304       0.00  Q         |         |         |        V|
   26+55        1.0304       0.00  Q         |         |         |        V|
   27+ 0        1.0304       0.00  Q         |         |         |        V|
   27+ 5        1.0304       0.00  Q         |         |         |        V|
   27+10        1.0304       0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

APPENDIX C: POST-PROJECT ONSITE UNIT HYDROGRAPH CALCULATIONS

APPENDIX C.1: POST-PROJECT UNIT HYDROGRAPH PARAMETERS TABLE

254.24 EUCLID MIXED USE SPECIFIC PLAN

Post-Project Unit Hydrograph Input Parameters

Area	Area (Acres)	AP	RI	Tc (min)	Tc (hours)
A1	4.61	0.1	56	12.03	0.201
A2	6.51	0.1	56	9.60	0.160
A3	4.78	0.1	56	8.11	0.135
A4	7.83	0.1	56	14.02	0.234
A5	2.71	0.1	56	8.92	0.149
A6	5.22	0.1	56	10.82	0.180
A7	2.25	0.1	56	8.07	0.135
B1	4.26	0.1	56	7.84	0.131
B2	1.61	0.1	56	5.68	0.095
B3	5.30	0.1	56	9.36	0.156
B4	3.16	0.1	56	7.20	0.120
B5	1.86	0.1	56	5.56	0.093
C1	4.98	0.1	56	8.40	0.140
C2	3.47	0.1	56	11.29	0.188

APPENDIX C.2 UNIT HYDROGRAPH ANALYSIS, AREAS "A"

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA A1
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.61	1	1.20
Rainfall data for year 100		
4.61	6	3.00
Rainfall data for year 100		
4.61	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	4.61	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)            Yield Fr
     0.46   0.100          56.0      56.0       7.86     0.266
     4.15   0.900          98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.201 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       4.61(Ac.)
Catchment Lag time =   0.161 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 51.8242
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       4.61(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph         Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        55.75 (CFS))

  1                4.903                  2.734
  2               31.878                 15.039
  3               71.604                 22.148
  4               91.335                 11.001
  5               97.505                  3.440
  6               98.931                  0.795
  7              100.000                  0.596
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.4440              0.4440
  2              0.5859              0.1419
  3              0.6891              0.1032
```

4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9671	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1154	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3900	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230

63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161

122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132

181	4.7565	0.0132
182	4.7697	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114

240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094

6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113

65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154

124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390

183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0970
192	0.1419	0.0061	0.1358
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131

242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093


```
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =     12.93(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))
```

```
     -----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0         5.0       10.0      15.0      20.0
---------------------------------------------------------------------------
  0+ 5       0.0002      0.03  Q         |         |         |         |
  0+10       0.0013      0.17  Q         |         |         |         |
  0+15       0.0039      0.37  Q         |         |         |         |
  0+20       0.0071      0.47  Q         |         |         |         |
  0+25       0.0106      0.51  VQ        |         |         |         |
  0+30       0.0142      0.52  VQ        |         |         |         |
  0+35       0.0178      0.52  VQ        |         |         |         |
  0+40       0.0214      0.52  VQ        |         |         |         |
  0+45       0.0250      0.53  VQ        |         |         |         |
  0+50       0.0287      0.53  VQ        |         |         |         |
  0+55       0.0323      0.53  VQ        |         |         |         |
  1+ 0       0.0359      0.53  VQ        |         |         |         |
  1+ 5       0.0396      0.53  VQ        |         |         |         |
  1+10       0.0433      0.53  VQ        |         |         |         |
  1+15       0.0470      0.53  VQ        |         |         |         |
  1+20       0.0506      0.54  VQ        |         |         |         |
  1+25       0.0544      0.54  |Q        |         |         |         |
  1+30       0.0581      0.54  |Q        |         |         |         |
  1+35       0.0618      0.54  |Q        |         |         |         |
  1+40       0.0655      0.54  |Q        |         |         |         |
  1+45       0.0693      0.54  |Q        |         |         |         |
  1+50       0.0730      0.55  |Q        |         |         |         |
  1+55       0.0768      0.55  |Q        |         |         |         |
  2+ 0       0.0806      0.55  |Q        |         |         |         |
  2+ 5       0.0844      0.55  |Q        |         |         |         |
  2+10       0.0882      0.55  |Q        |         |         |         |
  2+15       0.0920      0.55  |Q        |         |         |         |
  2+20       0.0958      0.55  |Q        |         |         |         |
  2+25       0.0996      0.56  |Q        |         |         |         |
  2+30       0.1035      0.56  |Q        |         |         |         |
  2+35       0.1073      0.56  |QV       |         |         |         |
  2+40       0.1112      0.56  |QV       |         |         |         |
  2+45       0.1151      0.56  |QV       |         |         |         |
  2+50       0.1190      0.57  |QV       |         |         |         |
  2+55       0.1229      0.57  |QV       |         |         |         |
  3+ 0       0.1268      0.57  |QV       |         |         |         |
  3+ 5       0.1307      0.57  |QV       |         |         |         |
  3+10       0.1347      0.57  |QV       |         |         |         |
  3+15       0.1386      0.57  |QV       |         |         |         |
  3+20       0.1426      0.58  |QV       |         |         |         |
  3+25       0.1466      0.58  |QV       |         |         |         |
  3+30       0.1506      0.58  |QV       |         |         |         |
  3+35       0.1546      0.58  |QV       |         |         |         |
  3+40       0.1586      0.58  |Q V      |         |         |         |
  3+45       0.1626      0.59  |Q V      |         |         |         |
  3+50       0.1667      0.59  |Q V      |         |         |         |
  3+55       0.1707      0.59  |Q V      |         |         |         |
  4+ 0       0.1748      0.59  |Q V      |         |         |         |
  4+ 5       0.1789      0.59  |Q V      |         |         |         |
  4+10       0.1830      0.60  |Q V      |         |         |         |
  4+15       0.1871      0.60  |Q V      |         |         |         |
  4+20       0.1912      0.60  |Q V      |         |         |         |
  4+25       0.1954      0.60  |Q V      |         |         |         |
  4+30       0.1995      0.60  |Q V      |         |         |         |
  4+35       0.2037      0.61  |Q V      |         |         |         |
  4+40       0.2079      0.61  |Q  V     |         |         |         |
```

4+45	0.2121	0.61	Q V			
4+50	0.2163	0.61	Q V			
4+55	0.2206	0.62	Q V			
5+ 0	0.2248	0.62	Q V			
5+ 5	0.2291	0.62	Q V			
5+10	0.2334	0.62	Q V			
5+15	0.2377	0.62	Q V			
5+20	0.2420	0.63	Q V			
5+25	0.2463	0.63	Q V			
5+30	0.2507	0.63	Q V			
5+35	0.2550	0.63	Q V			
5+40	0.2594	0.64	Q V			
5+45	0.2638	0.64	Q V			
5+50	0.2682	0.64	Q V			
5+55	0.2727	0.64	Q V			
6+ 0	0.2771	0.65	Q V			
6+ 5	0.2816	0.65	Q V			
6+10	0.2861	0.65	Q V			
6+15	0.2906	0.65	Q V			
6+20	0.2951	0.66	Q V			
6+25	0.2997	0.66	Q V			
6+30	0.3042	0.66	Q V			
6+35	0.3088	0.67	Q V			
6+40	0.3134	0.67	Q V			
6+45	0.3181	0.67	Q V			
6+50	0.3227	0.67	Q V			
6+55	0.3274	0.68	Q V			
7+ 0	0.3321	0.68	Q V			
7+ 5	0.3368	0.68	Q V			
7+10	0.3415	0.69	Q V			
7+15	0.3463	0.69	Q V			
7+20	0.3510	0.69	Q V			
7+25	0.3558	0.70	Q V			
7+30	0.3607	0.70	Q V			
7+35	0.3655	0.70	Q V			
7+40	0.3704	0.71	Q V			
7+45	0.3753	0.71	Q V			
7+50	0.3802	0.71	Q V			
7+55	0.3851	0.72	Q V			
8+ 0	0.3901	0.72	Q V			
8+ 5	0.3951	0.72	Q V			
8+10	0.4001	0.73	Q V			
8+15	0.4051	0.73	Q V			
8+20	0.4102	0.74	Q V			
8+25	0.4153	0.74	Q V			
8+30	0.4204	0.74	Q V			
8+35	0.4256	0.75	Q V			
8+40	0.4308	0.75	Q V			
8+45	0.4360	0.76	Q V			
8+50	0.4412	0.76	Q V			
8+55	0.4465	0.76	Q V			
9+ 0	0.4518	0.77	Q V			
9+ 5	0.4571	0.77	Q V			
9+10	0.4625	0.78	Q V			
9+15	0.4678	0.78	Q V			
9+20	0.4733	0.79	Q V			
9+25	0.4787	0.79	Q V			
9+30	0.4842	0.80	Q V			
9+35	0.4897	0.80	Q V			

9+40	0.4953	0.81	Q V			
9+45	0.5009	0.81	Q V			
9+50	0.5065	0.82	Q V			
9+55	0.5122	0.82	Q V			
10+ 0	0.5179	0.83	Q V			
10+ 5	0.5237	0.83	Q V			
10+10	0.5294	0.84	Q V			
10+15	0.5353	0.85	Q V			
10+20	0.5411	0.85	Q V			
10+25	0.5470	0.86	Q V			
10+30	0.5530	0.86	Q V			
10+35	0.5590	0.87	Q V			
10+40	0.5650	0.88	Q V			
10+45	0.5711	0.88	Q	V		
10+50	0.5772	0.89	Q	V		
10+55	0.5834	0.90	Q	V		
11+ 0	0.5896	0.90	Q	V		
11+ 5	0.5959	0.91	Q	V		
11+10	0.6022	0.92	Q	V		
11+15	0.6086	0.93	Q	V		
11+20	0.6151	0.93	Q	V		
11+25	0.6216	0.94	Q	V		
11+30	0.6281	0.95	Q	V		
11+35	0.6347	0.96	Q	V		
11+40	0.6414	0.97	Q	V		
11+45	0.6481	0.98	Q	V		
11+50	0.6549	0.99	Q	V		
11+55	0.6618	1.00	Q	V		
12+ 0	0.6687	1.01	Q	V		
12+ 5	0.6757	1.02	Q	V		
12+10	0.6828	1.03	Q	V		
12+15	0.6900	1.05	Q	V		
12+20	0.6974	1.07	Q	V		
12+25	0.7049	1.08	Q	V		
12+30	0.7124	1.09	Q	V		
12+35	0.7200	1.11	Q	V		
12+40	0.7277	1.12	Q	V		
12+45	0.7355	1.13	Q	V		
12+50	0.7434	1.15	Q	V		
12+55	0.7514	1.16	Q	V		
13+ 0	0.7595	1.17	Q	V		
13+ 5	0.7676	1.19	Q	V		
13+10	0.7759	1.20	Q	V		
13+15	0.7843	1.22	Q	V		
13+20	0.7929	1.24	Q	V		
13+25	0.8015	1.26	Q	V		
13+30	0.8103	1.27	Q	V		
13+35	0.8192	1.29	Q	V		
13+40	0.8282	1.31	Q	V		
13+45	0.8374	1.34	Q	V		
13+50	0.8468	1.36	Q	V		
13+55	0.8563	1.38	Q	V		
14+ 0	0.8660	1.41	Q	V		
14+ 5	0.8759	1.43	Q	V		
14+10	0.8859	1.46	Q	V		
14+15	0.8962	1.49	Q	V		
14+20	0.9067	1.52	Q	V		
14+25	0.9174	1.56	Q	V		
14+30	0.9283	1.59	Q	V		

```
14+35       0.9396       1.63  |  Q      |       V |         |         |
14+40       0.9511       1.67  |  Q      |       V |         |         |
14+45       0.9629       1.72  |  Q      |       V |         |         |
14+50       0.9751       1.77  |  Q      |       V |         |         |
14+55       0.9876       1.82  |  Q      |        V|         |         |
15+ 0       1.0006       1.88  |  Q      |        V|         |         |
15+ 5       1.0140       1.95  |  Q      |        V|         |         |
15+10       1.0279       2.02  |   Q     |        V|         |         |
15+15       1.0424       2.10  |   Q     |         V         |         |
15+20       1.0575       2.19  |   Q     |         V         |         |
15+25       1.0732       2.28  |   Q     |         V         |         |
15+30       1.0887       2.25  |   Q     |         V         |         |
15+35       1.1037       2.18  |   Q     |         |V        |         |
15+40       1.1192       2.25  |   Q     |         |V        |         |
15+45       1.1360       2.45  |   Q     |         |V        |         |
15+50       1.1551       2.77  |    Q    |         | V       |         |
15+55       1.1776       3.26  |     Q   |         | V       |         |
16+ 0       1.2062       4.15  |       Q |         |  V      |         |
16+ 5       1.2501       6.38  |         | Q       |   V     |         |
16+10       1.3270      11.17  |         |         | Q  V    |         |
16+15       1.4161      12.93  |         |         |    Q V  |         |
16+20       1.4713       8.02  |         |     Q   |       V |         |
16+25       1.5017       4.41  |       Q |         |       V |         |
16+30       1.5220       2.96  |    Q    |         |        V|         |
16+35       1.5403       2.65  |    Q    |         |        V|         |
16+40       1.5558       2.26  |   Q     |         |        V|         |
16+45       1.5701       2.08  |   Q     |         |         V         |
16+50       1.5834       1.93  |  Q      |         |         V         |
16+55       1.5959       1.81  |  Q      |         |         V         |
17+ 0       1.6077       1.71  |  Q      |         |         V         |
17+ 5       1.6188       1.62  |  Q      |         |         |V        |
17+10       1.6295       1.55  |  Q      |         |         |V        |
17+15       1.6397       1.48  | Q       |         |         |V        |
17+20       1.6495       1.43  | Q       |         |         |V        |
17+25       1.6590       1.37  | Q       |         |         |V        |
17+30       1.6681       1.33  | Q       |         |         | V       |
17+35       1.6770       1.29  | Q       |         |         | V       |
17+40       1.6856       1.25  | Q       |         |         | V       |
17+45       1.6940       1.22  | Q       |         |         | V       |
17+50       1.7021       1.18  | Q       |         |         | V       |
17+55       1.7101       1.15  | Q       |         |         | V       |
18+ 0       1.7178       1.13  | Q       |         |         |  V      |
18+ 5       1.7254       1.10  | Q       |         |         |  V      |
18+10       1.7328       1.07  | Q       |         |         |  V      |
18+15       1.7400       1.04  | Q       |         |         |  V      |
18+20       1.7469       1.01  | Q       |         |         |  V      |
18+25       1.7538       0.99  |Q        |         |         |  V      |
18+30       1.7605       0.97  |Q        |         |         |  V      |
18+35       1.7671       0.96  |Q        |         |         |   V     |
18+40       1.7735       0.94  |Q        |         |         |   V     |
18+45       1.7799       0.92  |Q        |         |         |   V     |
18+50       1.7862       0.91  |Q        |         |         |   V     |
18+55       1.7923       0.89  |Q        |         |         |   V     |
19+ 0       1.7984       0.88  |Q        |         |         |   V     |
19+ 5       1.8044       0.87  |Q        |         |         |   V     |
19+10       1.8103       0.86  |Q        |         |         |   V     |
19+15       1.8161       0.84  |Q        |         |         |   V     |
19+20       1.8218       0.83  |Q        |         |         |    V    |
19+25       1.8275       0.82  |Q        |         |         |    V    |
```

19+30	1.8331	0.81	Q			V
19+35	1.8386	0.80	Q			V
19+40	1.8440	0.79	Q			V
19+45	1.8494	0.78	Q			V
19+50	1.8547	0.77	Q			V
19+55	1.8600	0.76	Q			V
20+ 0	1.8652	0.75	Q			V
20+ 5	1.8703	0.75	Q			V
20+10	1.8754	0.74	Q			V
20+15	1.8804	0.73	Q			V
20+20	1.8854	0.72	Q			V
20+25	1.8903	0.72	Q			V
20+30	1.8952	0.71	Q			V
20+35	1.9001	0.70	Q			V
20+40	1.9049	0.70	Q			V
20+45	1.9096	0.69	Q			V
20+50	1.9143	0.68	Q			V
20+55	1.9190	0.68	Q			V
21+ 0	1.9236	0.67	Q			V
21+ 5	1.9282	0.66	Q			V
21+10	1.9327	0.66	Q			V
21+15	1.9372	0.65	Q			V
21+20	1.9417	0.65	Q			V
21+25	1.9461	0.64	Q			V
21+30	1.9505	0.64	Q			V
21+35	1.9549	0.63	Q			V
21+40	1.9592	0.63	Q			V
21+45	1.9635	0.62	Q			V
21+50	1.9677	0.62	Q			V
21+55	1.9720	0.61	Q			V
22+ 0	1.9762	0.61	Q			V
22+ 5	1.9803	0.61	Q			V
22+10	1.9845	0.60	Q			V
22+15	1.9886	0.60	Q			V
22+20	1.9927	0.59	Q			V
22+25	1.9967	0.59	Q			V
22+30	2.0008	0.58	Q			V
22+35	2.0048	0.58	Q			V
22+40	2.0087	0.58	Q			V
22+45	2.0127	0.57	Q			V
22+50	2.0166	0.57	Q			V
22+55	2.0205	0.57	Q			V
23+ 0	2.0244	0.56	Q			V
23+ 5	2.0282	0.56	Q			V
23+10	2.0321	0.56	Q			V
23+15	2.0359	0.55	Q			V
23+20	2.0397	0.55	Q			V
23+25	2.0434	0.55	Q			V
23+30	2.0472	0.54	Q			V
23+35	2.0509	0.54	Q			V
23+40	2.0546	0.54	Q			V
23+45	2.0583	0.53	Q			V
23+50	2.0619	0.53	Q			V
23+55	2.0655	0.53	Q			V
24+ 0	2.0692	0.53	Q			V
24+ 5	2.0726	0.50	Q			V
24+10	2.0750	0.36	Q			V
24+15	2.0761	0.15	Q			V
24+20	2.0764	0.05	Q			V

```
   24+25        2.0765       0.01  Q          |          |          |        V|
   24+30        2.0765       0.01  Q          |          |          |         V
-----------------------------------------------------------------------
```

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 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA A2
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
6.51	1	1.20
Rainfall data for year 100		
6.51	6	3.00
Rainfall data for year 100		
6.51	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	6.51	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.65   0.100          56.0      56.0       7.86     0.266
     5.86   0.900          98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.160 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       6.51(Ac.)
Catchment Lag time =   0.128 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 65.1042
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       6.51(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        78.73 (CFS))

  1               7.634                   6.010
  2              47.879                  31.686
  3              85.995                  30.008
  4              97.049                   8.703
  5              99.073                   1.594
  6             100.000                   0.729
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number            (In)                 (In)
  1             0.4440               0.4440
  2             0.5859               0.1419
  3             0.6890               0.1032
  4             0.7730               0.0840
```

5	0.8452	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0200	0.0531
9	1.0692	0.0492
10	1.1153	0.0460
11	1.1586	0.0433
12	1.1996	0.0410
13	1.2498	0.0501
14	1.2981	0.0483
15	1.3447	0.0466
16	1.3899	0.0451
17	1.4336	0.0438
18	1.4762	0.0425
19	1.5176	0.0414
20	1.5580	0.0404
21	1.5973	0.0394
22	1.6358	0.0385
23	1.6734	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8165	0.0347
28	1.8506	0.0341
29	1.8842	0.0335
30	1.9171	0.0330
31	1.9495	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0744	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228

64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9353	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	2.9999	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0821	0.0203
77	3.1024	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2595	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3540	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4640	0.0181
97	3.4820	0.0180
98	3.4999	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6911	0.0170
110	3.7080	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160

123	3.9210	0.0160
124	3.9369	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	3.9999	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0465	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1230	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1832	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2719	0.0147
147	4.2865	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3588	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4016	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.4999	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132

182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8733	0.0128
191	4.8861	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9370	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	4.9999	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2914	0.0118
225	5.3032	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3618	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4657	0.0114
240	5.4772	0.0114

241	5.4886	0.0114
242	5.4999	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6457	0.0111
256	5.6568	0.0111
257	5.6678	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094

7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114

66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155

125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0360
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0416

184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0970
192	0.1419	0.0061	0.1357
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130

243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

Total soil rain loss = 0.59(In)
Total effective rainfall = 5.41(In)
Peak flow rate in flood hydrograph = 19.41(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       0.0004       0.06  Q         |         |         |         |
  0+10       0.0028       0.35  Q         |         |         |         |
  0+15       0.0071       0.63  VQ        |         |         |         |
  0+20       0.0120       0.71  VQ        |         |         |         |
  0+25       0.0171       0.73  VQ        |         |         |         |
  0+30       0.0221       0.74  VQ        |         |         |         |
  0+35       0.0272       0.74  VQ        |         |         |         |
  0+40       0.0323       0.74  VQ        |         |         |         |
  0+45       0.0375       0.74  VQ        |         |         |         |
  0+50       0.0426       0.75  VQ        |         |         |         |
  0+55       0.0477       0.75  VQ        |         |         |         |
  1+ 0       0.0529       0.75  VQ        |         |         |         |
  1+ 5       0.0581       0.75  VQ        |         |         |         |
  1+10       0.0633       0.75  VQ        |         |         |         |
  1+15       0.0685       0.76  VQ        |         |         |         |
  1+20       0.0737       0.76  |Q        |         |         |         |
  1+25       0.0789       0.76  |Q        |         |         |         |
  1+30       0.0842       0.76  |Q        |         |         |         |
  1+35       0.0894       0.76  |Q        |         |         |         |
  1+40       0.0947       0.77  |Q        |         |         |         |
  1+45       0.1000       0.77  |Q        |         |         |         |
  1+50       0.1053       0.77  |Q        |         |         |         |
  1+55       0.1106       0.77  |Q        |         |         |         |
  2+ 0       0.1160       0.78  |Q        |         |         |         |
  2+ 5       0.1213       0.78  |Q        |         |         |         |
  2+10       0.1267       0.78  |Q        |         |         |         |
  2+15       0.1321       0.78  |Q        |         |         |         |
  2+20       0.1375       0.78  |Q        |         |         |         |
  2+25       0.1429       0.79  |Q        |         |         |         |
  2+30       0.1484       0.79  |QV       |         |         |         |
  2+35       0.1538       0.79  |QV       |         |         |         |
  2+40       0.1593       0.79  |QV       |         |         |         |
  2+45       0.1648       0.80  |QV       |         |         |         |
  2+50       0.1703       0.80  |QV       |         |         |         |
  2+55       0.1758       0.80  |QV       |         |         |         |
  3+ 0       0.1813       0.80  |QV       |         |         |         |
  3+ 5       0.1869       0.81  |QV       |         |         |         |
  3+10       0.1925       0.81  |QV       |         |         |         |
  3+15       0.1981       0.81  |QV       |         |         |         |
  3+20       0.2037       0.81  |QV       |         |         |         |
  3+25       0.2093       0.82  |QV       |         |         |         |
  3+30       0.2149       0.82  |QV       |         |         |         |
  3+35       0.2206       0.82  |Q V      |         |         |         |
  3+40       0.2263       0.83  |Q V      |         |         |         |
  3+45       0.2320       0.83  |Q V      |         |         |         |
  3+50       0.2377       0.83  |Q V      |         |         |         |
  3+55       0.2435       0.83  |Q V      |         |         |         |
  4+ 0       0.2492       0.84  |Q V      |         |         |         |
  4+ 5       0.2550       0.84  |Q V      |         |         |         |
  4+10       0.2608       0.84  |Q V      |         |         |         |
  4+15       0.2666       0.85  |Q V      |         |         |         |
  4+20       0.2725       0.85  |Q V      |         |         |         |
  4+25       0.2783       0.85  |Q V      |         |         |         |
  4+30       0.2842       0.85  |Q V      |         |         |         |
  4+35       0.2901       0.86  |Q V      |         |         |         |
  4+40       0.2960       0.86  |Q  V     |         |         |         |
  4+45       0.3020       0.86  |Q  V     |         |         |         |
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 4+50       0.3080       0.87  |Q  V     |         |         |         |
 4+55       0.3140       0.87  |Q  V     |         |         |         |
 5+ 0       0.3200       0.87  |Q  V     |         |         |         |
 5+ 5       0.3260       0.88  |Q  V     |         |         |         |
 5+10       0.3321       0.88  |Q  V     |         |         |         |
 5+15       0.3381       0.88  |Q  V     |         |         |         |
 5+20       0.3442       0.89  |Q  V     |         |         |         |
 5+25       0.3504       0.89  |Q  V     |         |         |         |
 5+30       0.3565       0.89  |Q  V     |         |         |         |
 5+35       0.3627       0.90  |Q  V     |         |         |         |
 5+40       0.3689       0.90  |Q   V    |         |         |         |
 5+45       0.3751       0.90  |Q   V    |         |         |         |
 5+50       0.3814       0.91  |Q   V    |         |         |         |
 5+55       0.3877       0.91  |Q   V    |         |         |         |
 6+ 0       0.3940       0.91  |Q   V    |         |         |         |
 6+ 5       0.4003       0.92  |Q   V    |         |         |         |
 6+10       0.4066       0.92  |Q   V    |         |         |         |
 6+15       0.4130       0.93  |Q   V    |         |         |         |
 6+20       0.4194       0.93  |Q   V    |         |         |         |
 6+25       0.4259       0.93  |Q   V    |         |         |         |
 6+30       0.4323       0.94  |Q   V    |         |         |         |
 6+35       0.4388       0.94  |Q   V    |         |         |         |
 6+40       0.4453       0.95  |Q    V   |         |         |         |
 6+45       0.4519       0.95  |Q    V   |         |         |         |
 6+50       0.4584       0.95  |Q    V   |         |         |         |
 6+55       0.4650       0.96  |Q    V   |         |         |         |
 7+ 0       0.4717       0.96  |Q    V   |         |         |         |
 7+ 5       0.4783       0.97  |Q    V   |         |         |         |
 7+10       0.4850       0.97  |Q    V   |         |         |         |
 7+15       0.4918       0.98  |Q    V   |         |         |         |
 7+20       0.4985       0.98  |Q    V   |         |         |         |
 7+25       0.5053       0.99  |Q    V   |         |         |         |
 7+30       0.5121       0.99  |Q    V   |         |         |         |
 7+35       0.5190       1.00  |Q     V  |         |         |         |
 7+40       0.5259       1.00  | Q    V  |         |         |         |
 7+45       0.5328       1.01  | Q    V  |         |         |         |
 7+50       0.5398       1.01  | Q    V  |         |         |         |
 7+55       0.5467       1.02  | Q    V  |         |         |         |
 8+ 0       0.5538       1.02  | Q    V  |         |         |         |
 8+ 5       0.5608       1.03  | Q    V  |         |         |         |
 8+10       0.5679       1.03  | Q    V  |         |         |         |
 8+15       0.5751       1.04  | Q    V  |         |         |         |
 8+20       0.5822       1.04  | Q    V  |         |         |         |
 8+25       0.5895       1.05  | Q     V |         |         |         |
 8+30       0.5967       1.05  | Q     V |         |         |         |
 8+35       0.6040       1.06  | Q     V |         |         |         |
 8+40       0.6113       1.06  | Q     V |         |         |         |
 8+45       0.6187       1.07  | Q     V |         |         |         |
 8+50       0.6261       1.08  | Q     V |         |         |         |
 8+55       0.6336       1.08  | Q     V |         |         |         |
 9+ 0       0.6411       1.09  | Q     V |         |         |         |
 9+ 5       0.6486       1.10  | Q     V |         |         |         |
 9+10       0.6562       1.10  | Q     V |         |         |         |
 9+15       0.6638       1.11  | Q      V|         |         |         |
 9+20       0.6715       1.11  | Q      V|         |         |         |
 9+25       0.6792       1.12  | Q      V|         |         |         |
 9+30       0.6870       1.13  | Q      V|         |         |         |
 9+35       0.6948       1.14  | Q      V|         |         |         |
 9+40       0.7027       1.14  | Q      V|         |         |         |
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  9+45       0.7106      1.15  | Q      V|         |         |         |
  9+50       0.7186      1.16  | Q      V|         |         |         |
  9+55       0.7266      1.17  | Q      V|         |         |         |
 10+ 0       0.7347      1.17  | Q       V         |         |         |
 10+ 5       0.7428      1.18  | Q       V         |         |         |
 10+10       0.7510      1.19  | Q       V         |         |         |
 10+15       0.7593      1.20  | Q       V         |         |         |
 10+20       0.7676      1.21  | Q       V         |         |         |
 10+25       0.7760      1.21  | Q       V         |         |         |
 10+30       0.7844      1.22  | Q       V         |         |         |
 10+35       0.7929      1.23  | Q       V         |         |         |
 10+40       0.8014      1.24  | Q       V         |         |         |
 10+45       0.8101      1.25  | Q       |V        |         |         |
 10+50       0.8187      1.26  | Q       |V        |         |         |
 10+55       0.8275      1.27  | Q       |V        |         |         |
 11+ 0       0.8363      1.28  | Q       |V        |         |         |
 11+ 5       0.8452      1.29  | Q       |V        |         |         |
 11+10       0.8542      1.30  | Q       |V        |         |         |
 11+15       0.8632      1.31  | Q       |V        |         |         |
 11+20       0.8723      1.32  | Q       |V        |         |         |
 11+25       0.8815      1.34  | Q       | V       |         |         |
 11+30       0.8908      1.35  | Q       | V       |         |         |
 11+35       0.9002      1.36  | Q       | V       |         |         |
 11+40       0.9096      1.37  | Q       | V       |         |         |
 11+45       0.9192      1.38  | Q       | V       |         |         |
 11+50       0.9288      1.40  | Q       | V       |         |         |
 11+55       0.9385      1.41  | Q       | V       |         |         |
 12+ 0       0.9483      1.43  | Q       | V       |         |         |
 12+ 5       0.9583      1.44  | Q       |  V      |         |         |
 12+10       0.9684      1.47  | Q       |  V      |         |         |
 12+15       0.9787      1.50  | Q       |  V      |         |         |
 12+20       0.9892      1.52  |  Q      |  V      |         |         |
 12+25       0.9997      1.53  |  Q      |  V      |         |         |
 12+30       1.0104      1.55  |  Q      |  V      |         |         |
 12+35       1.0212      1.57  |  Q      |  V      |         |         |
 12+40       1.0322      1.59  |  Q      |   V     |         |         |
 12+45       1.0432      1.61  |  Q      |   V     |         |         |
 12+50       1.0544      1.63  |  Q      |   V     |         |         |
 12+55       1.0657      1.64  |  Q      |   V     |         |         |
 13+ 0       1.0772      1.67  |  Q      |   V     |         |         |
 13+ 5       1.0888      1.69  |  Q      |   V     |         |         |
 13+10       1.1006      1.71  |  Q      |    V    |         |         |
 13+15       1.1126      1.73  |  Q      |    V    |         |         |
 13+20       1.1247      1.76  |  Q      |    V    |         |         |
 13+25       1.1369      1.78  |  Q      |    V    |         |         |
 13+30       1.1494      1.81  |  Q      |    V    |         |         |
 13+35       1.1621      1.84  |  Q      |    V    |         |         |
 13+40       1.1749      1.87  |  Q      |     V   |         |         |
 13+45       1.1880      1.90  |  Q      |     V   |         |         |
 13+50       1.2013      1.93  |  Q      |     V   |         |         |
 13+55       1.2148      1.96  |  Q      |     V   |         |         |
 14+ 0       1.2286      2.00  |   Q     |     V   |         |         |
 14+ 5       1.2426      2.04  |   Q     |     V   |         |         |
 14+10       1.2570      2.08  |   Q     |      V  |         |         |
 14+15       1.2716      2.12  |   Q     |      V  |         |         |
 14+20       1.2865      2.17  |   Q     |      V  |         |         |
 14+25       1.3018      2.22  |   Q     |      V  |         |         |
 14+30       1.3174      2.27  |   Q     |      V  |         |         |
 14+35       1.3334      2.33  |   Q     |       V |         |         |
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14+40       1.3499      2.39  |   Q     |       V |         |         |
14+45       1.3668      2.45  |   Q     |       V |         |         |
14+50       1.3842      2.53  |    Q    |       V |         |         |
14+55       1.4021      2.60  |    Q    |        V|         |         |
15+ 0       1.4206      2.69  |    Q    |        V|         |         |
15+ 5       1.4398      2.79  |    Q    |        V|         |         |
15+10       1.4598      2.90  |    Q    |        V|         |         |
15+15       1.4806      3.02  |     Q   |         V         |         |
15+20       1.5023      3.16  |     Q   |         V         |         |
15+25       1.5247      3.26  |     Q   |         V         |         |
15+30       1.5463      3.13  |     Q   |         |V        |         |
15+35       1.5673      3.05  |     Q   |         |V        |         |
15+40       1.5897      3.25  |     Q   |         |V        |         |
15+45       1.6144      3.59  |      Q  |         | V       |         |
15+50       1.6428      4.12  |       Q |         | V       |         |
15+55       1.6767      4.92  |        Q|         | V       |         |
16+ 0       1.7213      6.48  |         | Q       |  V      |         |
16+ 5       1.7939     10.55  |         |         |Q  V     |         |
16+10       1.9276     19.41  |         |         |     V   |       Q |
16+15       2.0468     17.30  |         |         |      V  |   Q     |
16+20       2.1041      8.32  |         |     Q   |       V |         |
16+25       2.1357      4.59  |        Q|         |        V|         |
16+30       2.1618      3.78  |      Q  |         |        V|         |
16+35       2.1847      3.33  |     Q   |         |        V|         |
16+40       2.2059      3.07  |     Q   |         |         V         |
16+45       2.2254      2.84  |    Q    |         |         V         |
16+50       2.2437      2.65  |    Q    |         |         V         |
16+55       2.2608      2.49  |   Q     |         |         V         |
17+ 0       2.2770      2.35  |   Q     |         |         |V        |
17+ 5       2.2925      2.24  |   Q     |         |         |V        |
17+10       2.3072      2.14  |   Q     |         |         |V        |
17+15       2.3214      2.06  |   Q     |         |         |V        |
17+20       2.3350      1.98  |  Q      |         |         |V        |
17+25       2.3482      1.91  |  Q      |         |         | V       |
17+30       2.3609      1.85  |  Q      |         |         | V       |
17+35       2.3733      1.79  |  Q      |         |         | V       |
17+40       2.3853      1.74  |  Q      |         |         | V       |
17+45       2.3970      1.70  |  Q      |         |         | V       |
17+50       2.4084      1.65  |  Q      |         |         | V       |
17+55       2.4195      1.61  |  Q      |         |         |  V      |
18+ 0       2.4303      1.58  |  Q      |         |         |  V      |
18+ 5       2.4409      1.54  |  Q      |         |         |  V      |
18+10       2.4512      1.49  | Q       |         |         |  V      |
18+15       2.4612      1.45  | Q       |         |         |  V      |
18+20       2.4710      1.42  | Q       |         |         |  V      |
18+25       2.4806      1.39  | Q       |         |         |  V      |
18+30       2.4900      1.36  | Q       |         |         |  V      |
18+35       2.4992      1.34  | Q       |         |         |   V     |
18+40       2.5083      1.32  | Q       |         |         |   V     |
18+45       2.5172      1.30  | Q       |         |         |   V     |
18+50       2.5260      1.28  | Q       |         |         |   V     |
18+55       2.5346      1.26  | Q       |         |         |   V     |
19+ 0       2.5431      1.24  | Q       |         |         |   V     |
19+ 5       2.5515      1.22  | Q       |         |         |   V     |
19+10       2.5598      1.20  | Q       |         |         |   V     |
19+15       2.5680      1.18  | Q       |         |         |    V    |
19+20       2.5760      1.17  | Q       |         |         |    V    |
19+25       2.5839      1.15  | Q       |         |         |    V    |
19+30       2.5918      1.14  | Q       |         |         |    V    |
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19+35	2.5995	1.12	Q			V
19+40	2.6072	1.11	Q			V
19+45	2.6147	1.10	Q			V
19+50	2.6222	1.09	Q			V
19+55	2.6296	1.07	Q			V
20+ 0	2.6369	1.06	Q			V
20+ 5	2.6441	1.05	Q			V
20+10	2.6513	1.04	Q			V
20+15	2.6584	1.03	Q			V
20+20	2.6654	1.02	Q			V
20+25	2.6723	1.01	Q			V
20+30	2.6792	1.00	Q			V
20+35	2.6860	0.99	Q			V
20+40	2.6927	0.98	Q			V
20+45	2.6994	0.97	Q			V
20+50	2.7060	0.96	Q			V
20+55	2.7126	0.95	Q			V
21+ 0	2.7191	0.94	Q			V
21+ 5	2.7255	0.94	Q			V
21+10	2.7319	0.93	Q			V
21+15	2.7382	0.92	Q			V
21+20	2.7445	0.91	Q			V
21+25	2.7508	0.91	Q			V
21+30	2.7569	0.90	Q			V
21+35	2.7631	0.89	Q			V
21+40	2.7692	0.88	Q			V
21+45	2.7752	0.88	Q			V
21+50	2.7812	0.87	Q			V
21+55	2.7872	0.86	Q			V
22+ 0	2.7931	0.86	Q			V
22+ 5	2.7990	0.85	Q			V
22+10	2.8048	0.85	Q			V
22+15	2.8106	0.84	Q			V
22+20	2.8163	0.83	Q			V
22+25	2.8220	0.83	Q			V
22+30	2.8277	0.82	Q			V
22+35	2.8333	0.82	Q			V
22+40	2.8389	0.81	Q			V
22+45	2.8445	0.81	Q			V
22+50	2.8500	0.80	Q			V
22+55	2.8555	0.80	Q			V
23+ 0	2.8610	0.79	Q			V
23+ 5	2.8664	0.79	Q			V
23+10	2.8718	0.78	Q			V
23+15	2.8772	0.78	Q			V
23+20	2.8825	0.77	Q			V
23+25	2.8878	0.77	Q			V
23+30	2.8931	0.77	Q			V
23+35	2.8983	0.76	Q			V
23+40	2.9035	0.76	Q			V
23+45	2.9087	0.75	Q			V
23+50	2.9139	0.75	Q			V
23+55	2.9190	0.74	Q			V
24+ 0	2.9241	0.74	Q			V
24+ 5	2.9288	0.68	Q			V
24+10	2.9314	0.38	Q			V
24+15	2.9321	0.10	Q			V
24+20	2.9323	0.02	Q			V
24+25	2.9323	0.01	Q			V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA A3
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.78	1	1.20
Rainfall data for year 100		
4.78	6	3.00
Rainfall data for year 100		
4.78	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	4.78	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.48   0.100          56.0      56.0       7.86     0.266
     4.30   0.900          98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.135 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       4.78(Ac.)
Catchment Lag time =   0.108 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 77.1605
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       4.78(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph         Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        57.81 (CFS))

  1              10.561                    6.105
  2              60.970                   29.141
  3              92.932                   18.477
  4              98.645                    3.303
  5             100.000                    0.783
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1             0.4440               0.4440
  2             0.5859               0.1419
  3             0.6891               0.1032
  4             0.7731               0.0840
  5             0.8453               0.0722
```

6	0.9092	0.0639
7	0.9671	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1154	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227

65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9211	0.0160

124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131

183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114

242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094

8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114

67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156

126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430

185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0970
192	0.1419	0.0061	0.1358
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128

244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
---------------------------------------------------------------------
---------------------------------------------------------------------
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =     16.12(CFS)
----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

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

```
-----------------------------------------------------------------------
  0+ 5       0.0004      0.06  Q         |         |         |         |
  0+10       0.0026      0.33  Q         |         |         |         |
  0+15       0.0061      0.50  Q         |         |         |         |
  0+20       0.0098      0.53  VQ        |         |         |         |
  0+25       0.0135      0.54  VQ        |         |         |         |
  0+30       0.0172      0.54  VQ        |         |         |         |
  0+35       0.0209      0.54  VQ        |         |         |         |
  0+40       0.0247      0.54  VQ        |         |         |         |
  0+45       0.0285      0.55  VQ        |         |         |         |
  0+50       0.0322      0.55  VQ        |         |         |         |
  0+55       0.0360      0.55  VQ        |         |         |         |
  1+ 0       0.0398      0.55  VQ        |         |         |         |
  1+ 5       0.0436      0.55  VQ        |         |         |         |
  1+10       0.0474      0.55  VQ        |         |         |         |
  1+15       0.0512      0.56  VQ        |         |         |         |
  1+20       0.0551      0.56  |Q        |         |         |         |
  1+25       0.0589      0.56  |Q        |         |         |         |
  1+30       0.0628      0.56  |Q        |         |         |         |
  1+35       0.0667      0.56  |Q        |         |         |         |
  1+40       0.0705      0.56  |Q        |         |         |         |
  1+45       0.0744      0.56  |Q        |         |         |         |
  1+50       0.0783      0.57  |Q        |         |         |         |
  1+55       0.0822      0.57  |Q        |         |         |         |
  2+ 0       0.0862      0.57  |Q        |         |         |         |
  2+ 5       0.0901      0.57  |Q        |         |         |         |
  2+10       0.0940      0.57  |Q        |         |         |         |
  2+15       0.0980      0.57  |Q        |         |         |         |
  2+20       0.1020      0.58  |Q        |         |         |         |
  2+25       0.1060      0.58  |Q        |         |         |         |
  2+30       0.1100      0.58  |QV       |         |         |         |
  2+35       0.1140      0.58  |QV       |         |         |         |
  2+40       0.1180      0.58  |QV       |         |         |         |
  2+45       0.1220      0.59  |QV       |         |         |         |
  2+50       0.1261      0.59  |QV       |         |         |         |
  2+55       0.1301      0.59  |QV       |         |         |         |
  3+ 0       0.1342      0.59  |QV       |         |         |         |
  3+ 5       0.1383      0.59  |QV       |         |         |         |
  3+10       0.1424      0.59  |QV       |         |         |         |
  3+15       0.1465      0.60  |QV       |         |         |         |
  3+20       0.1506      0.60  |QV       |         |         |         |
  3+25       0.1547      0.60  |QV       |         |         |         |
  3+30       0.1589      0.60  |QV       |         |         |         |
  3+35       0.1630      0.60  |Q V      |         |         |         |
  3+40       0.1672      0.61  |Q V      |         |         |         |
  3+45       0.1714      0.61  |Q V      |         |         |         |
  3+50       0.1756      0.61  |Q V      |         |         |         |
  3+55       0.1798      0.61  |Q V      |         |         |         |
  4+ 0       0.1841      0.61  |Q V      |         |         |         |
  4+ 5       0.1883      0.62  |Q V      |         |         |         |
  4+10       0.1926      0.62  |Q V      |         |         |         |
  4+15       0.1969      0.62  |Q V      |         |         |         |
  4+20       0.2012      0.62  |Q V      |         |         |         |
  4+25       0.2055      0.63  |Q V      |         |         |         |
  4+30       0.2098      0.63  |Q V      |         |         |         |
  4+35       0.2141      0.63  |Q V      |         |         |         |
  4+40       0.2185      0.63  |Q  V     |         |         |         |
  4+45       0.2229      0.63  |Q  V     |         |         |         |
  4+50       0.2272      0.64  |Q  V     |         |         |         |
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4+55	0.2316	0.64	Q V			
5+ 0	0.2361	0.64	Q V			
5+ 5	0.2405	0.64	Q V			
5+10	0.2449	0.65	Q V			
5+15	0.2494	0.65	Q V			
5+20	0.2539	0.65	Q V			
5+25	0.2584	0.65	Q V			
5+30	0.2629	0.66	Q V			
5+35	0.2675	0.66	Q V			
5+40	0.2720	0.66	Q V			
5+45	0.2766	0.66	Q V			
5+50	0.2812	0.67	Q V			
5+55	0.2858	0.67	Q V			
6+ 0	0.2904	0.67	Q V			
6+ 5	0.2951	0.68	Q V			
6+10	0.2998	0.68	Q V			
6+15	0.3044	0.68	Q V			
6+20	0.3092	0.68	Q V			
6+25	0.3139	0.69	Q V			
6+30	0.3186	0.69	Q V			
6+35	0.3234	0.69	Q V			
6+40	0.3282	0.70	Q V			
6+45	0.3330	0.70	Q V			
6+50	0.3378	0.70	Q V			
6+55	0.3427	0.70	Q V			
7+ 0	0.3476	0.71	Q V			
7+ 5	0.3525	0.71	Q V			
7+10	0.3574	0.71	Q V			
7+15	0.3623	0.72	Q V			
7+20	0.3673	0.72	Q V			
7+25	0.3723	0.72	Q V			
7+30	0.3773	0.73	Q V			
7+35	0.3824	0.73	Q V			
7+40	0.3874	0.74	Q V			
7+45	0.3925	0.74	Q V			
7+50	0.3976	0.74	Q V			
7+55	0.4028	0.75	Q V			
8+ 0	0.4079	0.75	Q V			
8+ 5	0.4131	0.75	Q V			
8+10	0.4183	0.76	Q V			
8+15	0.4236	0.76	Q V			
8+20	0.4289	0.77	Q V			
8+25	0.4342	0.77	Q V			
8+30	0.4395	0.77	Q V			
8+35	0.4449	0.78	Q V			
8+40	0.4502	0.78	Q V			
8+45	0.4557	0.79	Q V			
8+50	0.4611	0.79	Q V			
8+55	0.4666	0.80	Q V			
9+ 0	0.4721	0.80	Q V			
9+ 5	0.4777	0.81	Q V			
9+10	0.4832	0.81	Q V			
9+15	0.4889	0.81	Q V			
9+20	0.4945	0.82	Q V			
9+25	0.5002	0.82	Q V			
9+30	0.5059	0.83	Q V			
9+35	0.5117	0.84	Q V			
9+40	0.5174	0.84	Q V			
9+45	0.5233	0.85	Q V			

9+50	0.5291	0.85	Q V
9+55	0.5350	0.86	Q V
10+ 0	0.5410	0.86	Q V
10+ 5	0.5470	0.87	Q V
10+10	0.5530	0.87	Q V
10+15	0.5591	0.88	Q V
10+20	0.5652	0.89	Q V
10+25	0.5713	0.89	Q V
10+30	0.5775	0.90	Q V
10+35	0.5838	0.91	Q V
10+40	0.5901	0.91	Q V
10+45	0.5964	0.92	Q V
10+50	0.6028	0.93	Q V
10+55	0.6092	0.93	Q V
11+ 0	0.6157	0.94	Q V
11+ 5	0.6223	0.95	Q V
11+10	0.6289	0.96	Q V
11+15	0.6355	0.97	Q V
11+20	0.6422	0.97	Q V
11+25	0.6490	0.98	Q V
11+30	0.6558	0.99	Q V
11+35	0.6627	1.00	Q V
11+40	0.6697	1.01	Q V
11+45	0.6767	1.02	Q V
11+50	0.6838	1.03	Q V
11+55	0.6909	1.04	Q V
12+ 0	0.6982	1.05	Q V
12+ 5	0.7055	1.06	Q V
12+10	0.7130	1.09	Q V
12+15	0.7206	1.10	Q V
12+20	0.7283	1.12	Q V
12+25	0.7360	1.13	Q V
12+30	0.7439	1.14	Q V
12+35	0.7519	1.16	Q V
12+40	0.7599	1.17	Q V
12+45	0.7681	1.18	Q V
12+50	0.7763	1.20	Q V
12+55	0.7847	1.21	Q V
13+ 0	0.7931	1.23	Q V
13+ 5	0.8017	1.24	Q V
13+10	0.8103	1.26	Q V
13+15	0.8191	1.28	Q V
13+20	0.8281	1.30	Q V
13+25	0.8371	1.31	Q V
13+30	0.8463	1.33	Q V
13+35	0.8556	1.35	Q V
13+40	0.8651	1.38	Q V
13+45	0.8747	1.40	Q V
13+50	0.8846	1.42	Q V
13+55	0.8945	1.45	Q V
14+ 0	0.9047	1.48	Q V
14+ 5	0.9150	1.50	Q V
14+10	0.9256	1.54	Q V
14+15	0.9364	1.57	Q V
14+20	0.9474	1.60	Q V
14+25	0.9587	1.64	Q V
14+30	0.9703	1.68	Q V
14+35	0.9821	1.72	Q V
14+40	0.9942	1.77	Q V

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14+45       1.0067      1.81  |  Q      |       V |         |         |
14+50       1.0196      1.87  |  Q      |       V |         |         |
14+55       1.0329      1.93  |  Q      |        V|         |         |
15+ 0       1.0466      1.99  |  Q      |        V|         |         |
15+ 5       1.0608      2.06  |   Q     |        V|         |         |
15+10       1.0756      2.15  |   Q     |        V|         |         |
15+15       1.0910      2.24  |   Q     |         V         |         |
15+20       1.1072      2.35  |   Q     |         V         |         |
15+25       1.1237      2.40  |   Q     |         V         |         |
15+30       1.1393      2.26  |   Q     |         |V        |         |
15+35       1.1548      2.24  |   Q     |         |V        |         |
15+40       1.1715      2.43  |   Q     |         |V        |         |
15+45       1.1901      2.70  |    Q    |         | V       |         |
15+50       1.2117      3.14  |     Q   |         | V       |         |
15+55       1.2377      3.78  |      Q  |         | V       |         |
16+ 0       1.2729      5.11  |         Q         |  V      |         |
16+ 5       1.3327      8.69  |         |      Q  |   V     |         |
16+10       1.4437     16.12  |         |         |     V   | Q       |
16+15       1.5208     11.20  |         |         | Q     V |         |
16+20       1.5536      4.75  |        Q|         |       V |         |
16+25       1.5744      3.02  |     Q   |         |        V|         |
16+30       1.5919      2.54  |    Q    |         |        V|         |
16+35       1.6084      2.40  |   Q     |         |        V|         |
16+40       1.6236      2.21  |   Q     |         |         V         |
16+45       1.6376      2.04  |   Q     |         |         V         |
16+50       1.6508      1.91  |  Q      |         |         V         |
16+55       1.6632      1.80  |  Q      |         |         V         |
17+ 0       1.6749      1.70  |  Q      |         |         |V        |
17+ 5       1.6861      1.63  |  Q      |         |         |V        |
17+10       1.6968      1.56  |  Q      |         |         |V        |
17+15       1.7071      1.49  | Q       |         |         |V        |
17+20       1.7170      1.44  | Q       |         |         |V        |
17+25       1.7266      1.39  | Q       |         |         | V       |
17+30       1.7359      1.35  | Q       |         |         | V       |
17+35       1.7449      1.31  | Q       |         |         | V       |
17+40       1.7537      1.27  | Q       |         |         | V       |
17+45       1.7622      1.24  | Q       |         |         | V       |
17+50       1.7705      1.21  | Q       |         |         | V       |
17+55       1.7786      1.18  | Q       |         |         |  V      |
18+ 0       1.7865      1.15  | Q       |         |         |  V      |
18+ 5       1.7943      1.12  | Q       |         |         |  V      |
18+10       1.8017      1.09  | Q       |         |         |  V      |
18+15       1.8090      1.06  | Q       |         |         |  V      |
18+20       1.8162      1.04  | Q       |         |         |  V      |
18+25       1.8232      1.02  | Q       |         |         |  V      |
18+30       1.8300      1.00  |Q        |         |         |  V      |
18+35       1.8368      0.98  |Q        |         |         |   V     |
18+40       1.8434      0.96  |Q        |         |         |   V     |
18+45       1.8499      0.95  |Q        |         |         |   V     |
18+50       1.8564      0.93  |Q        |         |         |   V     |
18+55       1.8627      0.92  |Q        |         |         |   V     |
19+ 0       1.8689      0.90  |Q        |         |         |   V     |
19+ 5       1.8750      0.89  |Q        |         |         |   V     |
19+10       1.8811      0.88  |Q        |         |         |   V     |
19+15       1.8871      0.87  |Q        |         |         |    V    |
19+20       1.8930      0.86  |Q        |         |         |    V    |
19+25       1.8988      0.84  |Q        |         |         |    V    |
19+30       1.9045      0.83  |Q        |         |         |    V    |
19+35       1.9102      0.82  |Q        |         |         |    V    |
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19+40	1.9158	0.81	Q			V
19+45	1.9213	0.80	Q			V
19+50	1.9268	0.79	Q			V
19+55	1.9322	0.79	Q			V
20+ 0	1.9375	0.78	Q			V
20+ 5	1.9428	0.77	Q			V
20+10	1.9481	0.76	Q			V
20+15	1.9532	0.75	Q			V
20+20	1.9584	0.74	Q			V
20+25	1.9635	0.74	Q			V
20+30	1.9685	0.73	Q			V
20+35	1.9735	0.72	Q			V
20+40	1.9784	0.72	Q			V
20+45	1.9833	0.71	Q			V
20+50	1.9881	0.70	Q			V
20+55	1.9929	0.70	Q			V
21+ 0	1.9977	0.69	Q			V
21+ 5	2.0024	0.69	Q			V
21+10	2.0071	0.68	Q			V
21+15	2.0118	0.67	Q			V
21+20	2.0164	0.67	Q			V
21+25	2.0209	0.66	Q			V
21+30	2.0255	0.66	Q			V
21+35	2.0300	0.65	Q			V
21+40	2.0344	0.65	Q			V
21+45	2.0389	0.64	Q			V
21+50	2.0432	0.64	Q			V
21+55	2.0476	0.63	Q			V
22+ 0	2.0519	0.63	Q			V
22+ 5	2.0562	0.62	Q			V
22+10	2.0605	0.62	Q			V
22+15	2.0648	0.62	Q			V
22+20	2.0690	0.61	Q			V
22+25	2.0732	0.61	Q			V
22+30	2.0773	0.60	Q			V
22+35	2.0815	0.60	Q			V
22+40	2.0856	0.60	Q			V
22+45	2.0896	0.59	Q			V
22+50	2.0937	0.59	Q			V
22+55	2.0977	0.58	Q			V
23+ 0	2.1017	0.58	Q			V
23+ 5	2.1057	0.58	Q			V
23+10	2.1097	0.57	Q			V
23+15	2.1136	0.57	Q			V
23+20	2.1175	0.57	Q			V
23+25	2.1214	0.56	Q			V
23+30	2.1252	0.56	Q			V
23+35	2.1291	0.56	Q			V
23+40	2.1329	0.55	Q			V
23+45	2.1367	0.55	Q			V
23+50	2.1405	0.55	Q			V
23+55	2.1442	0.55	Q			V
24+ 0	2.1480	0.54	Q			V
24+ 5	2.1513	0.48	Q			V
24+10	2.1528	0.21	Q			V
24+15	2.1530	0.04	Q			V
24+20	2.1531	0.01	Q			V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA A4
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
7.83	1	1.20
Rainfall data for year 100		
7.83	6	3.00
Rainfall data for year 100		
7.83	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	7.83	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.78   0.100         56.0      56.0       7.86     0.266
     7.05   0.900         98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.234 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.83(Ac.)
Catchment Lag time =   0.187 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 44.5157
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       7.83(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
            (K =        94.69 (CFS))

  1                3.676                  3.481
  2               23.958                 19.205
  3               59.151                 33.326
  4               84.298                 23.812
  5               94.519                  9.678
  6               98.070                  3.363
  7               99.008                  0.889
  8              100.000                  0.444
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)               (In)
  1              0.4440              0.4440
  2              0.5858              0.1419
```

3	0.6890	0.1031
4	0.7730	0.0840
5	0.8452	0.0722
6	0.9091	0.0639
7	0.9669	0.0578
8	1.0200	0.0530
9	1.0692	0.0492
10	1.1152	0.0460
11	1.1585	0.0433
12	1.1996	0.0410
13	1.2497	0.0501
14	1.2980	0.0483
15	1.3446	0.0466
16	1.3898	0.0451
17	1.4336	0.0438
18	1.4761	0.0425
19	1.5175	0.0414
20	1.5579	0.0404
21	1.5973	0.0394
22	1.6358	0.0385
23	1.6734	0.0376
24	1.7102	0.0368
25	1.7463	0.0361
26	1.7817	0.0354
27	1.8165	0.0347
28	1.8506	0.0341
29	1.8841	0.0335
30	1.9171	0.0330
31	1.9495	0.0324
32	1.9814	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0744	0.0305
36	2.1045	0.0301
37	2.1342	0.0297
38	2.1635	0.0293
39	2.1925	0.0289
40	2.2210	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3047	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4895	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7328	0.0234
61	2.7560	0.0232

62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227
65	2.8470	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9353	0.0218
70	2.9570	0.0217
71	2.9785	0.0215
72	2.9999	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0821	0.0203
77	3.1023	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2595	0.0192
86	3.2786	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3353	0.0188
90	3.3540	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4459	0.0182
96	3.4640	0.0181
97	3.4820	0.0180
98	3.4999	0.0179
99	3.5177	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5706	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6911	0.0170
110	3.7080	0.0169
111	3.7248	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7748	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8567	0.0162
120	3.8729	0.0162

121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160
124	3.9369	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	3.9999	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0465	0.0155
132	4.0619	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1078	0.0152
136	4.1230	0.0152
137	4.1382	0.0151
138	4.1532	0.0151
139	4.1683	0.0150
140	4.1832	0.0150
141	4.1981	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2719	0.0147
147	4.2865	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3588	0.0144
153	4.3731	0.0143
154	4.3874	0.0143
155	4.4016	0.0142
156	4.4158	0.0142
157	4.4299	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.4999	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5551	0.0137
167	4.5688	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6232	0.0135
172	4.6367	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6903	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132

180	4.7433	0.0132
181	4.7565	0.0132
182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8733	0.0128
191	4.8861	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9370	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	4.9999	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0620	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1477	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1840	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2320	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2914	0.0118
225	5.3032	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3618	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115

239	5.4657	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.4999	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6235	0.0111
254	5.6347	0.0111
255	5.6457	0.0111
256	5.6568	0.0111
257	5.6678	0.0110
258	5.6788	0.0110
259	5.6898	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7770	0.0108
268	5.7879	0.0108
269	5.7986	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8842	0.0106
278	5.8949	0.0106
279	5.9054	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	5.9999	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094

5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113

64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153

123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0310
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0360
181	0.0425	0.0046	0.0379

182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0416
184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0530	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1031	0.0061	0.0970
192	0.1419	0.0061	0.1357
193	0.4440	0.0061	0.4378
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132

241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =     20.73(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
              R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))
```

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0002	0.03	Q				
0+10	0.0017	0.21	Q				
0+15	0.0053	0.52	Q				
0+20	0.0104	0.74	Q				
0+25	0.0161	0.83	VQ				
0+30	0.0221	0.87	VQ				
0+35	0.0282	0.88	VQ				
0+40	0.0343	0.89	VQ				
0+45	0.0404	0.89	VQ				
0+50	0.0465	0.89	VQ				
0+55	0.0527	0.89	VQ				
1+ 0	0.0588	0.89	VQ				
1+ 5	0.0650	0.90	VQ				
1+10	0.0712	0.90	VQ				
1+15	0.0774	0.90	VQ				
1+20	0.0836	0.90	VQ				
1+25	0.0899	0.91	Q				
1+30	0.0962	0.91	Q				
1+35	0.1024	0.91	Q				
1+40	0.1087	0.92	Q				
1+45	0.1151	0.92	Q				
1+50	0.1214	0.92	Q				
1+55	0.1278	0.92	Q				
2+ 0	0.1341	0.93	Q				
2+ 5	0.1405	0.93	Q				
2+10	0.1469	0.93	Q				
2+15	0.1534	0.93	Q				
2+20	0.1598	0.94	Q				
2+25	0.1663	0.94	Q				
2+30	0.1728	0.94	Q				
2+35	0.1793	0.95	QV				
2+40	0.1858	0.95	QV				
2+45	0.1924	0.95	QV				
2+50	0.1990	0.95	QV				
2+55	0.2056	0.96	QV				
3+ 0	0.2122	0.96	QV				
3+ 5	0.2188	0.96	QV				
3+10	0.2255	0.97	QV				
3+15	0.2321	0.97	QV				
3+20	0.2388	0.97	QV				
3+25	0.2455	0.98	QV				
3+30	0.2523	0.98	QV				
3+35	0.2590	0.98	QV				
3+40	0.2658	0.99	Q V				
3+45	0.2726	0.99	Q V				
3+50	0.2795	0.99	Q V				
3+55	0.2863	1.00	Q V				
4+ 0	0.2932	1.00	Q V				
4+ 5	0.3001	1.00	Q V				
4+10	0.3070	1.01	Q V				
4+15	0.3140	1.01	Q V				
4+20	0.3209	1.01	Q V				
4+25	0.3279	1.02	Q V				
4+30	0.3350	1.02	Q V				
4+35	0.3420	1.02	Q V				

4+40	0.3491	1.03	Q V			
4+45	0.3562	1.03	Q V			
4+50	0.3633	1.03	Q V			
4+55	0.3704	1.04	Q V			
5+ 0	0.3776	1.04	Q V			
5+ 5	0.3848	1.05	Q V			
5+10	0.3921	1.05	Q V			
5+15	0.3993	1.05	Q V			
5+20	0.4066	1.06	Q V			
5+25	0.4139	1.06	Q V			
5+30	0.4212	1.07	Q V			
5+35	0.4286	1.07	Q V			
5+40	0.4360	1.07	Q V			
5+45	0.4434	1.08	Q V			
5+50	0.4509	1.08	Q V			
5+55	0.4584	1.09	Q V			
6+ 0	0.4659	1.09	Q V			
6+ 5	0.4734	1.10	Q V			
6+10	0.4810	1.10	Q V			
6+15	0.4886	1.10	Q V			
6+20	0.4963	1.11	Q V			
6+25	0.5039	1.11	Q V			
6+30	0.5117	1.12	Q V			
6+35	0.5194	1.12	Q V			
6+40	0.5272	1.13	Q V			
6+45	0.5350	1.13	Q V			
6+50	0.5428	1.14	Q V			
6+55	0.5507	1.14	Q V			
7+ 0	0.5586	1.15	Q V			
7+ 5	0.5666	1.15	Q V			
7+10	0.5745	1.16	Q V			
7+15	0.5826	1.16	Q V			
7+20	0.5906	1.17	Q V			
7+25	0.5987	1.18	Q V			
7+30	0.6068	1.18	Q V			
7+35	0.6150	1.19	Q V			
7+40	0.6232	1.19	Q V			
7+45	0.6315	1.20	Q V			
7+50	0.6398	1.20	Q V			
7+55	0.6481	1.21	Q V			
8+ 0	0.6565	1.22	Q V			
8+ 5	0.6649	1.22	Q V			
8+10	0.6734	1.23	Q V			
8+15	0.6819	1.24	Q V			
8+20	0.6904	1.24	Q V			
8+25	0.6990	1.25	Q V			
8+30	0.7077	1.25	Q V			
8+35	0.7164	1.26	Q V			
8+40	0.7251	1.27	Q V			
8+45	0.7339	1.28	Q V			
8+50	0.7427	1.28	Q V			
8+55	0.7516	1.29	Q V			
9+ 0	0.7605	1.30	Q V			
9+ 5	0.7695	1.30	Q V			
9+10	0.7786	1.31	Q V			
9+15	0.7877	1.32	Q V			
9+20	0.7968	1.33	Q V			
9+25	0.8060	1.34	Q V			
9+30	0.8153	1.34	Q V			

9+35	0.8246	1.35	Q V
9+40	0.8340	1.36	Q V
9+45	0.8434	1.37	Q V
9+50	0.8529	1.38	Q V
9+55	0.8625	1.39	Q V
10+ 0	0.8721	1.40	Q V
10+ 5	0.8818	1.41	Q V
10+10	0.8915	1.42	Q V
10+15	0.9013	1.43	Q V
10+20	0.9112	1.44	Q V
10+25	0.9212	1.45	Q V
10+30	0.9312	1.46	Q V
10+35	0.9413	1.47	Q V
10+40	0.9515	1.48	Q V
10+45	0.9618	1.49	Q V
10+50	0.9721	1.50	Q V
10+55	0.9825	1.51	Q V
11+ 0	0.9930	1.52	Q V
11+ 5	1.0036	1.54	Q V
11+10	1.0142	1.55	Q V
11+15	1.0250	1.56	Q V
11+20	1.0358	1.57	Q V
11+25	1.0468	1.59	Q V
11+30	1.0578	1.60	Q V
11+35	1.0690	1.62	Q V
11+40	1.0802	1.63	Q V
11+45	1.0915	1.65	Q V
11+50	1.1030	1.66	Q V
11+55	1.1145	1.68	Q V
12+ 0	1.1262	1.69	Q V
12+ 5	1.1380	1.71	Q V
12+10	1.1499	1.74	Q V
12+15	1.1621	1.77	Q V
12+20	1.1745	1.80	Q V
12+25	1.1870	1.82	Q V
12+30	1.1997	1.84	Q V
12+35	1.2125	1.86	Q V
12+40	1.2255	1.88	Q V
12+45	1.2386	1.91	Q V
12+50	1.2519	1.93	Q V
12+55	1.2654	1.95	Q V
13+ 0	1.2790	1.98	Q V
13+ 5	1.2927	2.00	Q V
13+10	1.3067	2.03	Q V
13+15	1.3208	2.05	Q V
13+20	1.3352	2.08	Q V
13+25	1.3497	2.11	Q V
13+30	1.3645	2.14	Q V
13+35	1.3795	2.18	Q V
13+40	1.3947	2.21	Q V
13+45	1.4101	2.24	Q V
13+50	1.4259	2.28	Q V
13+55	1.4418	2.32	Q V
14+ 0	1.4581	2.36	Q V
14+ 5	1.4747	2.41	Q V
14+10	1.4916	2.45	Q V
14+15	1.5088	2.50	Q V
14+20	1.5264	2.56	Q V
14+25	1.5444	2.61	Q V

```
14+30       1.5628      2.67   |  Q      |      V  |         |         |
14+35       1.5816      2.74   |  Q      |       V |         |         |
14+40       1.6010      2.80   |  Q      |       V |         |         |
14+45       1.6208      2.88   |  Q      |       V |         |         |
14+50       1.6412      2.96   |  Q      |       V |         |         |
14+55       1.6622      3.05   |   Q     |       V |         |         |
15+ 0       1.6839      3.15   |   Q     |        V|         |         |
15+ 5       1.7063      3.25   |   Q     |        V|         |         |
15+10       1.7295      3.37   |   Q     |        V|         |         |
15+15       1.7537      3.51   |   Q     |        V|         |         |
15+20       1.7789      3.66   |   Q     |         V         |         |
15+25       1.8051      3.80   |    Q    |         V         |         |
15+30       1.8313      3.81   |    Q    |         V         |         |
15+35       1.8569      3.72   |   Q     |         |V        |         |
15+40       1.8829      3.77   |    Q    |         |V        |         |
15+45       1.9107      4.04   |    Q    |         |V        |         |
15+50       1.9418      4.51   |     Q   |         | V       |         |
15+55       1.9781      5.26   |      Q  |         | V       |         |
16+ 0       2.0233      6.57   |       Q |         |  V      |         |
16+ 5       2.0902      9.71   |         | Q       |  V      |         |
16+10       2.2032     16.41   |         |         |Q   V    |         |
16+15       2.3460     20.73   |         |         |     VQ  |         |
16+20       2.4554     15.88   |         |         |Q     V  |         |
16+25       2.5197      9.33   |         | Q       |       V |         |
16+30       2.5609      5.99   |      Q  |         |        V|         |
16+35       2.5924      4.58   |     Q   |         |        V|         |
16+40       2.6204      4.07   |    Q    |         |        V|         |
16+45       2.6453      3.61   |   Q     |         |         V         |
16+50       2.6683      3.34   |   Q     |         |         V         |
16+55       2.6898      3.12   |   Q     |         |         V         |
17+ 0       2.7101      2.94   |  Q      |         |         V         |
17+ 5       2.7293      2.79   |  Q      |         |         |V        |
17+10       2.7475      2.65   |  Q      |         |         |V        |
17+15       2.7650      2.54   |  Q      |         |         |V        |
17+20       2.7818      2.44   |  Q      |         |         |V        |
17+25       2.7980      2.35   |  Q      |         |         |V        |
17+30       2.8136      2.27   |  Q      |         |         | V       |
17+35       2.8288      2.20   | Q       |         |         | V       |
17+40       2.8434      2.13   | Q       |         |         | V       |
17+45       2.8577      2.07   | Q       |         |         | V       |
17+50       2.8716      2.02   | Q       |         |         | V       |
17+55       2.8851      1.97   | Q       |         |         | V       |
18+ 0       2.8984      1.92   | Q       |         |         |  V      |
18+ 5       2.9113      1.87   | Q       |         |         |  V      |
18+10       2.9238      1.83   | Q       |         |         |  V      |
18+15       2.9361      1.77   | Q       |         |         |  V      |
18+20       2.9479      1.73   | Q       |         |         |  V      |
18+25       2.9596      1.69   | Q       |         |         |  V      |
18+30       2.9710      1.66   | Q       |         |         |  V      |
18+35       2.9822      1.63   | Q       |         |         |   V     |
18+40       2.9932      1.60   | Q       |         |         |   V     |
18+45       3.0040      1.57   | Q       |         |         |   V     |
18+50       3.0146      1.54   | Q       |         |         |   V     |
18+55       3.0251      1.52   | Q       |         |         |   V     |
19+ 0       3.0354      1.50   |Q        |         |         |   V     |
19+ 5       3.0455      1.47   |Q        |         |         |   V     |
19+10       3.0555      1.45   |Q        |         |         |   V     |
19+15       3.0654      1.43   |Q        |         |         |   V     |
19+20       3.0751      1.41   |Q        |         |         |    V    |
```

19+25	3.0847	1.39	Q			V
19+30	3.0942	1.38	Q			V
19+35	3.1035	1.36	Q			V
19+40	3.1128	1.34	Q			V
19+45	3.1219	1.32	Q			V
19+50	3.1309	1.31	Q			V
19+55	3.1398	1.29	Q			V
20+ 0	3.1486	1.28	Q			V
20+ 5	3.1574	1.27	Q			V
20+10	3.1660	1.25	Q			V
20+15	3.1745	1.24	Q			V
20+20	3.1830	1.23	Q			V
20+25	3.1913	1.21	Q			V
20+30	3.1996	1.20	Q			V
20+35	3.2078	1.19	Q			V
20+40	3.2159	1.18	Q			V
20+45	3.2240	1.17	Q			V
20+50	3.2319	1.16	Q			V
20+55	3.2398	1.15	Q			V
21+ 0	3.2476	1.14	Q			V
21+ 5	3.2554	1.13	Q			V
21+10	3.2631	1.12	Q			V
21+15	3.2707	1.11	Q			V
21+20	3.2783	1.10	Q			V
21+25	3.2858	1.09	Q			V
21+30	3.2932	1.08	Q			V
21+35	3.3006	1.07	Q			V
21+40	3.3080	1.06	Q			V
21+45	3.3152	1.06	Q			V
21+50	3.3224	1.05	Q			V
21+55	3.3296	1.04	Q			V
22+ 0	3.3367	1.03	Q			V
22+ 5	3.3438	1.03	Q			V
22+10	3.3508	1.02	Q			V
22+15	3.3578	1.01	Q			V
22+20	3.3647	1.00	Q			V
22+25	3.3715	1.00	Q			V
22+30	3.3784	0.99	Q			V
22+35	3.3851	0.98	Q			V
22+40	3.3919	0.98	Q			V
22+45	3.3985	0.97	Q			V
22+50	3.4052	0.96	Q			V
22+55	3.4118	0.96	Q			V
23+ 0	3.4184	0.95	Q			V
23+ 5	3.4249	0.95	Q			V
23+10	3.4314	0.94	Q			V
23+15	3.4378	0.94	Q			V
23+20	3.4442	0.93	Q			V
23+25	3.4506	0.92	Q			V
23+30	3.4569	0.92	Q			V
23+35	3.4632	0.91	Q			V
23+40	3.4695	0.91	Q			V
23+45	3.4757	0.90	Q			V
23+50	3.4819	0.90	Q			V
23+55	3.4880	0.89	Q			V
24+ 0	3.4942	0.89	Q			V
24+ 5	3.5000	0.85	Q			V
24+10	3.5046	0.67	Q			V
24+15	3.5071	0.36	Q			V

```
  24+20       3.5080      0.13  Q         |         |         |        V|
  24+25       3.5083      0.04  Q         |         |         |        V|
  24+30       3.5084      0.01  Q         |         |         |        V|
  24+35       3.5084      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
     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 - 2014, Version 9.0

           Study date  03/13/23

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


Program License Serial Number 6279

---------------------------------------------------------------------
265.24 EUCLID AVE
POST-PROJECT - AREA A5
100-YEAR 24-HOUR UNIT HYDROGRAPH

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

      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
           2.71            1          1.20
--------------------------------------------------------------------
Rainfall data for year 100
           2.71            6          3.00
--------------------------------------------------------------------
Rainfall data for year 100
           2.71           24          6.00
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** 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)
 56.0      56.0          2.71      1.000     0.734    0.100    0.073

Area-averaged adjusted loss rate Fm (In/Hr) =  0.073
```

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.27	0.100	56.0	56.0	7.86	0.266
2.44	0.900	98.0	98.0	0.20	0.960

Area-averaged catchment yield fraction, Y = 0.891
Area-averaged low loss fraction, Yb = 0.109
User entry of time of concentration = 0.149 (hours)
+++
Watershed area = 2.71(Ac.)
Catchment Lag time = 0.119 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 69.9105
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 2.71(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.200(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(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 =	32.77 (CFS))	
1	8.755	2.869
2	53.373	14.623
3	89.259	11.761
4	97.900	2.832
5	99.455	0.510
6	100.000	0.178

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6891	0.1032
4	0.7732	0.0840

5	0.8454	0.0722
6	0.9093	0.0640
7	0.9671	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1155	0.0460
11	1.1588	0.0433
12	1.1998	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3449	0.0466
16	1.3901	0.0451
17	1.4338	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228

64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160

123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132

182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114

241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094

7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114

66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155

125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0403	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415

184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0640	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4441	0.0061	0.4380
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130

243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

Total soil rain loss = 0.59(In)
Total effective rainfall = 5.41(In)
Peak flow rate in flood hydrograph = 8.54(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0          2.5        5.0        7.5       10.0
-----------------------------------------------------------------------
  0+ 5       0.0002       0.03  Q         |          |          |          |
  0+10       0.0013       0.16  Q         |          |          |          |
  0+15       0.0032       0.27  VQ        |          |          |          |
  0+20       0.0052       0.30  VQ        |          |          |          |
  0+25       0.0073       0.30  VQ        |          |          |          |
  0+30       0.0094       0.31  VQ        |          |          |          |
  0+35       0.0116       0.31  VQ        |          |          |          |
  0+40       0.0137       0.31  VQ        |          |          |          |
  0+45       0.0158       0.31  VQ        |          |          |          |
  0+50       0.0180       0.31  VQ        |          |          |          |
  0+55       0.0201       0.31  VQ        |          |          |          |
  1+ 0       0.0223       0.31  VQ        |          |          |          |
  1+ 5       0.0244       0.31  VQ        |          |          |          |
  1+10       0.0266       0.31  VQ        |          |          |          |
  1+15       0.0287       0.31  VQ        |          |          |          |
  1+20       0.0309       0.32  |Q        |          |          |          |
  1+25       0.0331       0.32  |Q        |          |          |          |
  1+30       0.0353       0.32  |Q        |          |          |          |
  1+35       0.0375       0.32  |Q        |          |          |          |
  1+40       0.0397       0.32  |Q        |          |          |          |
  1+45       0.0419       0.32  |Q        |          |          |          |
  1+50       0.0441       0.32  |Q        |          |          |          |
  1+55       0.0463       0.32  |Q        |          |          |          |
  2+ 0       0.0485       0.32  |Q        |          |          |          |
  2+ 5       0.0508       0.32  |Q        |          |          |          |
  2+10       0.0530       0.32  |Q        |          |          |          |
  2+15       0.0552       0.33  |Q        |          |          |          |
  2+20       0.0575       0.33  |Q        |          |          |          |
  2+25       0.0597       0.33  |Q        |          |          |          |
  2+30       0.0620       0.33  |QV       |          |          |          |
  2+35       0.0643       0.33  |QV       |          |          |          |
  2+40       0.0666       0.33  |QV       |          |          |          |
  2+45       0.0688       0.33  |QV       |          |          |          |
  2+50       0.0711       0.33  |QV       |          |          |          |
  2+55       0.0734       0.33  |QV       |          |          |          |
  3+ 0       0.0757       0.33  |QV       |          |          |          |
  3+ 5       0.0781       0.34  |QV       |          |          |          |
  3+10       0.0804       0.34  |QV       |          |          |          |
  3+15       0.0827       0.34  |QV       |          |          |          |
  3+20       0.0850       0.34  |QV       |          |          |          |
  3+25       0.0874       0.34  |QV       |          |          |          |
  3+30       0.0897       0.34  |QV       |          |          |          |
  3+35       0.0921       0.34  |Q V      |          |          |          |
  3+40       0.0945       0.34  |Q V      |          |          |          |
  3+45       0.0968       0.34  |Q V      |          |          |          |
  3+50       0.0992       0.35  |Q V      |          |          |          |
  3+55       0.1016       0.35  |Q V      |          |          |          |
  4+ 0       0.1040       0.35  |Q V      |          |          |          |
  4+ 5       0.1064       0.35  |Q V      |          |          |          |
  4+10       0.1088       0.35  |Q V      |          |          |          |
  4+15       0.1113       0.35  |Q V      |          |          |          |
  4+20       0.1137       0.35  |Q V      |          |          |          |
  4+25       0.1161       0.35  |Q V      |          |          |          |
  4+30       0.1186       0.36  |Q V      |          |          |          |
  4+35       0.1210       0.36  |Q V      |          |          |          |
  4+40       0.1235       0.36  |Q  V     |          |          |          |
  4+45       0.1260       0.36  |Q  V     |          |          |          |
```

4+50	0.1285	0.36	Q V			
4+55	0.1310	0.36	Q V			
5+ 0	0.1335	0.36	Q V			
5+ 5	0.1360	0.36	Q V			
5+10	0.1385	0.37	Q V			
5+15	0.1410	0.37	Q V			
5+20	0.1436	0.37	Q V			
5+25	0.1461	0.37	Q V			
5+30	0.1487	0.37	Q V			
5+35	0.1513	0.37	Q V			
5+40	0.1539	0.37	Q V			
5+45	0.1564	0.38	Q V			
5+50	0.1590	0.38	Q V			
5+55	0.1617	0.38	Q V			
6+ 0	0.1643	0.38	Q V			
6+ 5	0.1669	0.38	Q V			
6+10	0.1696	0.38	Q V			
6+15	0.1722	0.39	Q V			
6+20	0.1749	0.39	Q V			
6+25	0.1776	0.39	Q V			
6+30	0.1803	0.39	Q V			
6+35	0.1830	0.39	Q V			
6+40	0.1857	0.39	Q V			
6+45	0.1884	0.40	Q V			
6+50	0.1911	0.40	Q V			
6+55	0.1939	0.40	Q V			
7+ 0	0.1967	0.40	Q V			
7+ 5	0.1994	0.40	Q V			
7+10	0.2022	0.40	Q V			
7+15	0.2050	0.41	Q V			
7+20	0.2078	0.41	Q V			
7+25	0.2107	0.41	Q V			
7+30	0.2135	0.41	Q V			
7+35	0.2164	0.41	Q V			
7+40	0.2192	0.42	Q V			
7+45	0.2221	0.42	Q V			
7+50	0.2250	0.42	Q V			
7+55	0.2279	0.42	Q V			
8+ 0	0.2309	0.43	Q V			
8+ 5	0.2338	0.43	Q V			
8+10	0.2368	0.43	Q V			
8+15	0.2397	0.43	Q V			
8+20	0.2427	0.43	Q V			
8+25	0.2457	0.44	Q V			
8+30	0.2487	0.44	Q V			
8+35	0.2518	0.44	Q V			
8+40	0.2548	0.44	Q V			
8+45	0.2579	0.45	Q V			
8+50	0.2610	0.45	Q V			
8+55	0.2641	0.45	Q V			
9+ 0	0.2672	0.45	Q V			
9+ 5	0.2704	0.46	Q V			
9+10	0.2735	0.46	Q V			
9+15	0.2767	0.46	Q V			
9+20	0.2799	0.46	Q V			
9+25	0.2831	0.47	Q V			
9+30	0.2864	0.47	Q V			
9+35	0.2896	0.47	Q V			
9+40	0.2929	0.48	Q V			

```
 9+45       0.2962      0.48   |Q       V|         |         |         |
 9+50       0.2995      0.48   |Q       V|         |         |         |
 9+55       0.3029      0.49   |Q       V|         |         |         |
10+ 0       0.3062      0.49   |Q        V         |         |         |
10+ 5       0.3096      0.49   |Q        V         |         |         |
10+10       0.3130      0.50   |Q        V         |         |         |
10+15       0.3165      0.50   |Q        V         |         |         |
10+20       0.3199      0.50   | Q       V         |         |         |
10+25       0.3234      0.51   | Q       V         |         |         |
10+30       0.3269      0.51   | Q       V         |         |         |
10+35       0.3305      0.51   | Q       V         |         |         |
10+40       0.3340      0.52   | Q       V         |         |         |
10+45       0.3376      0.52   | Q       |V        |         |         |
10+50       0.3412      0.53   | Q       |V        |         |         |
10+55       0.3449      0.53   | Q       |V        |         |         |
11+ 0       0.3486      0.53   | Q       |V        |         |         |
11+ 5       0.3523      0.54   | Q       |V        |         |         |
11+10       0.3560      0.54   | Q       |V        |         |         |
11+15       0.3598      0.55   | Q       |V        |         |         |
11+20       0.3636      0.55   | Q       |V        |         |         |
11+25       0.3674      0.56   | Q       | V       |         |         |
11+30       0.3713      0.56   | Q       | V       |         |         |
11+35       0.3752      0.57   | Q       | V       |         |         |
11+40       0.3791      0.57   | Q       | V       |         |         |
11+45       0.3831      0.58   | Q       | V       |         |         |
11+50       0.3871      0.58   | Q       | V       |         |         |
11+55       0.3911      0.59   | Q       | V       |         |         |
12+ 0       0.3952      0.59   | Q       | V       |         |         |
12+ 5       0.3994      0.60   | Q       |  V      |         |         |
12+10       0.4036      0.61   | Q       |  V      |         |         |
12+15       0.4079      0.62   | Q       |  V      |         |         |
12+20       0.4123      0.63   | Q       |  V      |         |         |
12+25       0.4167      0.64   | Q       |  V      |         |         |
12+30       0.4211      0.65   | Q       |  V      |         |         |
12+35       0.4256      0.65   | Q       |  V      |         |         |
12+40       0.4302      0.66   | Q       |   V     |         |         |
12+45       0.4348      0.67   | Q       |   V     |         |         |
12+50       0.4395      0.68   | Q       |   V     |         |         |
12+55       0.4442      0.69   | Q       |   V     |         |         |
13+ 0       0.4490      0.69   | Q       |   V     |         |         |
13+ 5       0.4538      0.70   | Q       |   V     |         |         |
13+10       0.4587      0.71   | Q       |    V    |         |         |
13+15       0.4637      0.72   | Q       |    V    |         |         |
13+20       0.4687      0.73   | Q       |    V    |         |         |
13+25       0.4739      0.74   | Q       |    V    |         |         |
13+30       0.4791      0.75   |  Q      |    V    |         |         |
13+35       0.4843      0.77   |  Q      |    V    |         |         |
13+40       0.4897      0.78   |  Q      |     V   |         |         |
13+45       0.4951      0.79   |  Q      |     V   |         |         |
13+50       0.5007      0.81   |  Q      |     V   |         |         |
13+55       0.5063      0.82   |  Q      |     V   |         |         |
14+ 0       0.5121      0.83   |  Q      |     V   |         |         |
14+ 5       0.5179      0.85   |  Q      |     V   |         |         |
14+10       0.5239      0.87   |  Q      |      V  |         |         |
14+15       0.5300      0.89   |  Q      |      V  |         |         |
14+20       0.5362      0.90   |  Q      |      V  |         |         |
14+25       0.5426      0.92   |  Q      |      V  |         |         |
14+30       0.5491      0.95   |  Q      |      V  |         |         |
14+35       0.5558      0.97   |  Q      |       V |         |         |
```

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14+40       0.5627      1.00  |  Q      |       V |         |         |
14+45       0.5697      1.02  |   Q     |       V |         |         |
14+50       0.5770      1.05  |   Q     |       V |         |         |
14+55       0.5845      1.09  |   Q     |        V|         |         |
15+ 0       0.5922      1.12  |   Q     |        V|         |         |
15+ 5       0.6003      1.16  |   Q     |        V|         |         |
15+10       0.6086      1.21  |   Q     |        V|         |         |
15+15       0.6173      1.26  |    Q    |         V         |         |
15+20       0.6264      1.32  |    Q    |         V         |         |
15+25       0.6357      1.36  |    Q    |         V         |         |
15+30       0.6447      1.30  |    Q    |         |V        |         |
15+35       0.6534      1.27  |    Q    |         |V        |         |
15+40       0.6628      1.36  |    Q    |         |V        |         |
15+45       0.6732      1.51  |     Q   |         | V       |         |
15+50       0.6852      1.74  |     Q   |         | V       |         |
15+55       0.6996      2.09  |       Q |         | V       |         |
16+ 0       0.7187      2.78  |         |Q        |  V      |         |
16+ 5       0.7505      4.61  |         |       Q |   V     |         |
16+10       0.8093      8.54  |         |         |     V   |   Q     |
16+15       0.8567      6.88  |         |         |      QV |         |
16+20       0.8782      3.12  |         | Q       |        V|         |
16+25       0.8906      1.80  |      Q  |         |        V|         |
16+30       0.9011      1.52  |     Q   |         |        V|         |
16+35       0.9105      1.38  |    Q    |         |        V|         |
16+40       0.9193      1.27  |    Q    |         |         V         |
16+45       0.9273      1.17  |   Q     |         |         V         |
16+50       0.9348      1.09  |   Q     |         |         V         |
16+55       0.9419      1.03  |   Q     |         |         V         |
17+ 0       0.9486      0.97  |  Q      |         |         |V        |
17+ 5       0.9550      0.93  |  Q      |         |         |V        |
17+10       0.9611      0.89  |  Q      |         |         |V        |
17+15       0.9670      0.85  |  Q      |         |         |V        |
17+20       0.9727      0.82  |  Q      |         |         |V        |
17+25       0.9781      0.79  |  Q      |         |         | V       |
17+30       0.9834      0.77  |  Q      |         |         | V       |
17+35       0.9885      0.74  | Q       |         |         | V       |
17+40       0.9935      0.72  | Q       |         |         | V       |
17+45       0.9984      0.70  | Q       |         |         | V       |
17+50       1.0031      0.69  | Q       |         |         | V       |
17+55       1.0077      0.67  | Q       |         |         |  V      |
18+ 0       1.0122      0.65  | Q       |         |         |  V      |
18+ 5       1.0166      0.64  | Q       |         |         |  V      |
18+10       1.0209      0.62  | Q       |         |         |  V      |
18+15       1.0250      0.60  | Q       |         |         |  V      |
18+20       1.0291      0.59  | Q       |         |         |  V      |
18+25       1.0331      0.58  | Q       |         |         |  V      |
18+30       1.0370      0.57  | Q       |         |         |  V      |
18+35       1.0408      0.56  | Q       |         |         |   V     |
18+40       1.0446      0.55  | Q       |         |         |   V     |
18+45       1.0483      0.54  | Q       |         |         |   V     |
18+50       1.0519      0.53  | Q       |         |         |   V     |
18+55       1.0555      0.52  | Q       |         |         |   V     |
19+ 0       1.0591      0.51  | Q       |         |         |   V     |
19+ 5       1.0626      0.51  | Q       |         |         |   V     |
19+10       1.0660      0.50  |Q        |         |         |   V     |
19+15       1.0694      0.49  |Q        |         |         |    V    |
19+20       1.0727      0.49  |Q        |         |         |    V    |
19+25       1.0760      0.48  |Q        |         |         |    V    |
19+30       1.0793      0.47  |Q        |         |         |    V    |
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19+35	1.0825	0.47	Q			V
19+40	1.0857	0.46	Q			V
19+45	1.0888	0.46	Q			V
19+50	1.0919	0.45	Q			V
19+55	1.0950	0.45	Q			V
20+ 0	1.0980	0.44	Q			V
20+ 5	1.1011	0.44	Q			V
20+10	1.1040	0.43	Q			V
20+15	1.1070	0.43	Q			V
20+20	1.1099	0.42	Q			V
20+25	1.1128	0.42	Q			V
20+30	1.1156	0.41	Q			V
20+35	1.1185	0.41	Q			V
20+40	1.1213	0.41	Q			V
20+45	1.1240	0.40	Q			V
20+50	1.1268	0.40	Q			V
20+55	1.1295	0.40	Q			V
21+ 0	1.1322	0.39	Q			V
21+ 5	1.1349	0.39	Q			V
21+10	1.1375	0.39	Q			V
21+15	1.1402	0.38	Q			V
21+20	1.1428	0.38	Q			V
21+25	1.1454	0.38	Q			V
21+30	1.1480	0.37	Q			V
21+35	1.1505	0.37	Q			V
21+40	1.1530	0.37	Q			V
21+45	1.1556	0.37	Q			V
21+50	1.1581	0.36	Q			V
21+55	1.1605	0.36	Q			V
22+ 0	1.1630	0.36	Q			V
22+ 5	1.1654	0.35	Q			V
22+10	1.1679	0.35	Q			V
22+15	1.1703	0.35	Q			V
22+20	1.1727	0.35	Q			V
22+25	1.1750	0.34	Q			V
22+30	1.1774	0.34	Q			V
22+35	1.1797	0.34	Q			V
22+40	1.1821	0.34	Q			V
22+45	1.1844	0.34	Q			V
22+50	1.1867	0.33	Q			V
22+55	1.1890	0.33	Q			V
23+ 0	1.1912	0.33	Q			V
23+ 5	1.1935	0.33	Q			V
23+10	1.1957	0.33	Q			V
23+15	1.1980	0.32	Q			V
23+20	1.2002	0.32	Q			V
23+25	1.2024	0.32	Q			V
23+30	1.2046	0.32	Q			V
23+35	1.2068	0.32	Q			V
23+40	1.2089	0.31	Q			V
23+45	1.2111	0.31	Q			V
23+50	1.2132	0.31	Q			V
23+55	1.2154	0.31	Q			V
24+ 0	1.2175	0.31	Q			V
24+ 5	1.2194	0.28	Q			V
24+10	1.2204	0.14	Q			V
24+15	1.2206	0.03	Q			V
24+20	1.2207	0.01	Q			V
24+25	1.2207	0.00	Q			V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA A6
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
5.22	1	1.20
Rainfall data for year 100		
5.22	6	3.00
Rainfall data for year 100		
5.22	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	5.22	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.52	0.100	56.0	56.0	7.86	0.266
4.70	0.900	98.0	98.0	0.20	0.960

Area-averaged catchment yield fraction, Y = 0.891
Area-averaged low loss fraction, Yb = 0.109
User entry of time of concentration = 0.180 (hours)
+++
Watershed area = 5.22(Ac.)
Catchment Lag time = 0.144 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 57.8704
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 5.22(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000	Adjusted rainfall = 0.444(In)
30-minute factor = 1.000	Adjusted rainfall = 0.909(In)
1-hour factor = 1.000	Adjusted rainfall = 1.200(In)
3-hour factor = 1.000	Adjusted rainfall = 2.105(In)
6-hour factor = 1.000	Adjusted rainfall = 3.000(In)
24-hour factor = 1.000	Adjusted rainfall = 6.000(In)

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

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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K =	63.13 (CFS))	
1	6.077	3.836
2	39.009	20.790
3	79.564	25.602
4	94.634	9.514
5	98.466	2.419
6	99.524	0.668
7	100.000	0.301

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032

4	0.7731	0.0840
5	0.8453	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1153	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2981	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8165	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9171	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230

63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4820	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7080	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161

122	3.9051	0.0160
123	3.9210	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132

181	4.7565	0.0132
182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114

240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094

6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113

65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154

124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390

183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0970
192	0.1419	0.0061	0.1358
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131

242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =       0.59(In)
Total effective rainfall =       5.41(In)
Peak flow rate in flood hydrograph =      14.62(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))
```

```
    -----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0         5.0       10.0      15.0      20.0
-----------------------------------------------------------------------
  0+ 5        0.0002      0.04  Q          |         |         |         |
  0+10        0.0018      0.23  Q          |         |         |         |
  0+15        0.0050      0.47  Q          |         |         |         |
  0+20        0.0089      0.56  VQ         |         |         |         |
  0+25        0.0129      0.58  VQ         |         |         |         |
  0+30        0.0169      0.59  VQ         |         |         |         |
  0+35        0.0210      0.59  VQ         |         |         |         |
  0+40        0.0251      0.59  VQ         |         |         |         |
  0+45        0.0292      0.60  VQ         |         |         |         |
  0+50        0.0333      0.60  VQ         |         |         |         |
  0+55        0.0374      0.60  VQ         |         |         |         |
  1+ 0        0.0416      0.60  VQ         |         |         |         |
  1+ 5        0.0457      0.60  VQ         |         |         |         |
  1+10        0.0499      0.60  VQ         |         |         |         |
  1+15        0.0541      0.61  VQ         |         |         |         |
  1+20        0.0582      0.61  VQ         |         |         |         |
  1+25        0.0624      0.61  |Q         |         |         |         |
  1+30        0.0666      0.61  |Q         |         |         |         |
  1+35        0.0709      0.61  |Q         |         |         |         |
  1+40        0.0751      0.61  |Q         |         |         |         |
  1+45        0.0793      0.62  |Q         |         |         |         |
  1+50        0.0836      0.62  |Q         |         |         |         |
  1+55        0.0878      0.62  |Q         |         |         |         |
  2+ 0        0.0921      0.62  |Q         |         |         |         |
  2+ 5        0.0964      0.62  |Q         |         |         |         |
  2+10        0.1007      0.63  |Q         |         |         |         |
  2+15        0.1050      0.63  |Q         |         |         |         |
  2+20        0.1094      0.63  |Q         |         |         |         |
  2+25        0.1137      0.63  |Q         |         |         |         |
  2+30        0.1181      0.63  |QV        |         |         |         |
  2+35        0.1224      0.63  |QV        |         |         |         |
  2+40        0.1268      0.64  |QV        |         |         |         |
  2+45        0.1312      0.64  |QV        |         |         |         |
  2+50        0.1356      0.64  |QV        |         |         |         |
  2+55        0.1401      0.64  |QV        |         |         |         |
  3+ 0        0.1445      0.64  |QV        |         |         |         |
  3+ 5        0.1490      0.65  |QV        |         |         |         |
  3+10        0.1534      0.65  |QV        |         |         |         |
  3+15        0.1579      0.65  |QV        |         |         |         |
  3+20        0.1624      0.65  |QV        |         |         |         |
  3+25        0.1669      0.65  |QV        |         |         |         |
  3+30        0.1714      0.66  |QV        |         |         |         |
  3+35        0.1760      0.66  |QV        |         |         |         |
  3+40        0.1805      0.66  |Q V       |         |         |         |
  3+45        0.1851      0.66  |Q V       |         |         |         |
  3+50        0.1897      0.67  |Q V       |         |         |         |
  3+55        0.1943      0.67  |Q V       |         |         |         |
  4+ 0        0.1989      0.67  |Q V       |         |         |         |
  4+ 5        0.2035      0.67  |Q V       |         |         |         |
  4+10        0.2082      0.67  |Q V       |         |         |         |
  4+15        0.2128      0.68  |Q V       |         |         |         |
  4+20        0.2175      0.68  |Q V       |         |         |         |
  4+25        0.2222      0.68  |Q V       |         |         |         |
  4+30        0.2269      0.68  |Q V       |         |         |         |
  4+35        0.2317      0.69  |Q V       |         |         |         |
  4+40        0.2364      0.69  |Q  V      |         |         |         |
```

4+45	0.2412	0.69	Q V			
4+50	0.2460	0.69	Q V			
4+55	0.2508	0.70	Q V			
5+ 0	0.2556	0.70	Q V			
5+ 5	0.2604	0.70	Q V			
5+10	0.2653	0.70	Q V			
5+15	0.2701	0.71	Q V			
5+20	0.2750	0.71	Q V			
5+25	0.2799	0.71	Q V			
5+30	0.2849	0.72	Q V			
5+35	0.2898	0.72	Q V			
5+40	0.2948	0.72	Q V			
5+45	0.2998	0.72	Q V			
5+50	0.3048	0.73	Q V			
5+55	0.3098	0.73	Q V			
6+ 0	0.3149	0.73	Q V			
6+ 5	0.3199	0.74	Q V			
6+10	0.3250	0.74	Q V			
6+15	0.3301	0.74	Q V			
6+20	0.3353	0.75	Q V			
6+25	0.3404	0.75	Q V			
6+30	0.3456	0.75	Q V			
6+35	0.3508	0.75	Q V			
6+40	0.3560	0.76	Q V			
6+45	0.3613	0.76	Q V			
6+50	0.3665	0.76	Q V			
6+55	0.3718	0.77	Q V			
7+ 0	0.3771	0.77	Q V			
7+ 5	0.3825	0.78	Q V			
7+10	0.3878	0.78	Q V			
7+15	0.3932	0.78	Q V			
7+20	0.3986	0.79	Q V			
7+25	0.4041	0.79	Q V			
7+30	0.4095	0.79	Q V			
7+35	0.4150	0.80	Q V			
7+40	0.4205	0.80	Q V			
7+45	0.4261	0.81	Q V			
7+50	0.4317	0.81	Q V			
7+55	0.4373	0.81	Q V			
8+ 0	0.4429	0.82	Q V			
8+ 5	0.4486	0.82	Q V			
8+10	0.4542	0.83	Q V			
8+15	0.4600	0.83	Q V			
8+20	0.4657	0.83	Q V			
8+25	0.4715	0.84	Q V			
8+30	0.4773	0.84	Q V			
8+35	0.4831	0.85	Q V			
8+40	0.4890	0.85	Q V			
8+45	0.4949	0.86	Q V			
8+50	0.5008	0.86	Q V			
8+55	0.5068	0.87	Q V			
9+ 0	0.5128	0.87	Q V			
9+ 5	0.5189	0.88	Q V			
9+10	0.5249	0.88	Q V			
9+15	0.5310	0.89	Q V			
9+20	0.5372	0.89	Q V			
9+25	0.5434	0.90	Q V			
9+30	0.5496	0.90	Q V			
9+35	0.5559	0.91	Q V			

```
 9+40       0.5622      0.92   |Q       V|         |         |         |
 9+45       0.5685      0.92   |Q       V|         |         |         |
 9+50       0.5749      0.93   |Q       V|         |         |         |
 9+55       0.5813      0.93   |Q       V|         |         |         |
10+ 0       0.5878      0.94   |Q       V|         |         |         |
10+ 5       0.5943      0.95   |Q        V         |         |         |
10+10       0.6009      0.95   |Q        V         |         |         |
10+15       0.6075      0.96   |Q        V         |         |         |
10+20       0.6141      0.97   |Q        V         |         |         |
10+25       0.6208      0.97   |Q        V         |         |         |
10+30       0.6276      0.98   |Q        V         |         |         |
10+35       0.6344      0.99   |Q        V         |         |         |
10+40       0.6412      0.99   |Q        V         |         |         |
10+45       0.6481      1.00   | Q       |V        |         |         |
10+50       0.6551      1.01   | Q       |V        |         |         |
10+55       0.6621      1.02   | Q       |V        |         |         |
11+ 0       0.6692      1.03   | Q       |V        |         |         |
11+ 5       0.6763      1.03   | Q       |V        |         |         |
11+10       0.6835      1.04   | Q       |V        |         |         |
11+15       0.6907      1.05   | Q       |V        |         |         |
11+20       0.6980      1.06   | Q       |V        |         |         |
11+25       0.7054      1.07   | Q       |V        |         |         |
11+30       0.7128      1.08   | Q       | V       |         |         |
11+35       0.7203      1.09   | Q       | V       |         |         |
11+40       0.7278      1.10   | Q       | V       |         |         |
11+45       0.7355      1.11   | Q       | V       |         |         |
11+50       0.7432      1.12   | Q       | V       |         |         |
11+55       0.7510      1.13   | Q       | V       |         |         |
12+ 0       0.7588      1.14   | Q       | V       |         |         |
12+ 5       0.7668      1.15   | Q       |  V      |         |         |
12+10       0.7748      1.17   | Q       |  V      |         |         |
12+15       0.7831      1.20   | Q       |  V      |         |         |
12+20       0.7915      1.21   | Q       |  V      |         |         |
12+25       0.7999      1.23   | Q       |  V      |         |         |
12+30       0.8085      1.24   | Q       |  V      |         |         |
12+35       0.8171      1.26   | Q       |  V      |         |         |
12+40       0.8259      1.27   | Q       |   V     |         |         |
12+45       0.8347      1.28   | Q       |   V     |         |         |
12+50       0.8437      1.30   | Q       |   V     |         |         |
12+55       0.8527      1.32   | Q       |   V     |         |         |
13+ 0       0.8619      1.33   | Q       |   V     |         |         |
13+ 5       0.8712      1.35   | Q       |   V     |         |         |
13+10       0.8806      1.37   | Q       |   V     |         |         |
13+15       0.8901      1.39   | Q       |    V    |         |         |
13+20       0.8998      1.41   | Q       |    V    |         |         |
13+25       0.9096      1.43   | Q       |    V    |         |         |
13+30       0.9196      1.45   | Q       |    V    |         |         |
13+35       0.9297      1.47   | Q       |    V    |         |         |
13+40       0.9400      1.49   | Q       |    V    |         |         |
13+45       0.9505      1.52   |  Q      |     V   |         |         |
13+50       0.9611      1.54   |  Q      |     V   |         |         |
13+55       0.9719      1.57   |  Q      |     V   |         |         |
14+ 0       0.9829      1.60   |  Q      |     V   |         |         |
14+ 5       0.9941      1.63   |  Q      |     V   |         |         |
14+10       1.0055      1.66   |  Q      |      V  |         |         |
14+15       1.0172      1.69   |  Q      |      V  |         |         |
14+20       1.0291      1.73   |  Q      |      V  |         |         |
14+25       1.0413      1.77   |  Q      |      V  |         |         |
14+30       1.0538      1.81   |  Q      |      V  |         |         |
```

```
14+35       1.0666      1.86  |  Q      |       V |         |         |
14+40       1.0797      1.90  |  Q      |       V |         |         |
14+45       1.0932      1.96  |  Q      |       V |         |         |
14+50       1.1070      2.01  |   Q     |       V |         |         |
14+55       1.1213      2.08  |   Q     |        V|         |         |
15+ 0       1.1361      2.14  |   Q     |        V|         |         |
15+ 5       1.1514      2.22  |   Q     |        V|         |         |
15+10       1.1672      2.30  |   Q     |        V|         |         |
15+15       1.1838      2.40  |   Q     |         V         |         |
15+20       1.2011      2.51  |    Q    |         V         |         |
15+25       1.2189      2.60  |    Q    |         V         |         |
15+30       1.2364      2.54  |    Q    |         |V        |         |
15+35       1.2533      2.45  |   Q     |         |V        |         |
15+40       1.2710      2.57  |    Q    |         |V        |         |
15+45       1.2905      2.82  |    Q    |         |V        |         |
15+50       1.3126      3.21  |     Q   |         | V       |         |
15+55       1.3389      3.82  |      Q  |         | V       |         |
16+ 0       1.3729      4.94  |        Q|         |  V      |         |
16+ 5       1.4266      7.80  |         |    Q    |   V     |         |
16+10       1.5231     14.01  |         |         |    V  Q |         |
16+15       1.6238     14.62  |         |         |      V Q|         |
16+20       1.6776      7.81  |         |    Q    |       V |         |
16+25       1.7069      4.27  |       Q |         |        V|         |
16+30       1.7286      3.15  |     Q   |         |        V|         |
16+35       1.7480      2.82  |    Q    |         |        V|         |
16+40       1.7653      2.51  |    Q    |         |         V         |
16+45       1.7813      2.31  |   Q     |         |         V         |
16+50       1.7961      2.15  |   Q     |         |         V         |
16+55       1.8100      2.02  |   Q     |         |         V         |
17+ 0       1.8232      1.91  |  Q      |         |         |V        |
17+ 5       1.8357      1.82  |  Q      |         |         |V        |
17+10       1.8476      1.73  |  Q      |         |         |V        |
17+15       1.8591      1.66  |  Q      |         |         |V        |
17+20       1.8701      1.60  |  Q      |         |         |V        |
17+25       1.8807      1.54  |  Q      |         |         |V        |
17+30       1.8910      1.49  | Q       |         |         | V       |
17+35       1.9010      1.45  | Q       |         |         | V       |
17+40       1.9107      1.41  | Q       |         |         | V       |
17+45       1.9201      1.37  | Q       |         |         | V       |
17+50       1.9293      1.33  | Q       |         |         | V       |
17+55       1.9382      1.30  | Q       |         |         | V       |
18+ 0       1.9470      1.27  | Q       |         |         |  V      |
18+ 5       1.9555      1.24  | Q       |         |         |  V      |
18+10       1.9638      1.21  | Q       |         |         |  V      |
18+15       1.9719      1.17  | Q       |         |         |  V      |
18+20       1.9798      1.14  | Q       |         |         |  V      |
18+25       1.9875      1.12  | Q       |         |         |  V      |
18+30       1.9950      1.10  | Q       |         |         |  V      |
18+35       2.0025      1.08  | Q       |         |         |   V     |
18+40       2.0098      1.06  | Q       |         |         |   V     |
18+45       2.0169      1.04  | Q       |         |         |   V     |
18+50       2.0240      1.03  | Q       |         |         |   V     |
18+55       2.0310      1.01  | Q       |         |         |   V     |
19+ 0       2.0378      0.99  |Q        |         |         |   V     |
19+ 5       2.0446      0.98  |Q        |         |         |   V     |
19+10       2.0512      0.97  |Q        |         |         |   V     |
19+15       2.0578      0.95  |Q        |         |         |    V    |
19+20       2.0642      0.94  |Q        |         |         |    V    |
19+25       2.0706      0.93  |Q        |         |         |    V    |
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19+30	2.0769	0.92	Q			V	
19+35	2.0832	0.90	Q			V	
19+40	2.0893	0.89	Q			V	
19+45	2.0954	0.88	Q			V	
19+50	2.1014	0.87	Q			V	
19+55	2.1073	0.86	Q			V	
20+ 0	2.1132	0.85	Q			V	
20+ 5	2.1190	0.84	Q			V	
20+10	2.1248	0.83	Q			V	
20+15	2.1304	0.83	Q			V	
20+20	2.1361	0.82	Q			V	
20+25	2.1416	0.81	Q			V	
20+30	2.1472	0.80	Q			V	
20+35	2.1526	0.79	Q			V	
20+40	2.1580	0.79	Q			V	
20+45	2.1634	0.78	Q			V	
20+50	2.1687	0.77	Q			V	
20+55	2.1740	0.76	Q			V	
21+ 0	2.1792	0.76	Q			V	
21+ 5	2.1844	0.75	Q			V	
21+10	2.1895	0.75	Q			V	
21+15	2.1946	0.74	Q			V	
21+20	2.1997	0.73	Q			V	
21+25	2.2047	0.73	Q			V	
21+30	2.2096	0.72	Q			V	
21+35	2.2146	0.72	Q			V	
21+40	2.2195	0.71	Q			V	
21+45	2.2243	0.70	Q			V	
21+50	2.2291	0.70	Q			V	
21+55	2.2339	0.69	Q			V	
22+ 0	2.2387	0.69	Q			V	
22+ 5	2.2434	0.68	Q			V	
22+10	2.2481	0.68	Q			V	
22+15	2.2527	0.67	Q			V	
22+20	2.2573	0.67	Q			V	
22+25	2.2619	0.67	Q			V	
22+30	2.2665	0.66	Q			V	
22+35	2.2710	0.66	Q			V	
22+40	2.2755	0.65	Q			V	
22+45	2.2799	0.65	Q			V	
22+50	2.2844	0.64	Q			V	
22+55	2.2888	0.64	Q			V	
23+ 0	2.2932	0.64	Q			V	
23+ 5	2.2975	0.63	Q			V	
23+10	2.3019	0.63	Q			V	
23+15	2.3062	0.63	Q			V	
23+20	2.3104	0.62	Q			V	
23+25	2.3147	0.62	Q			V	
23+30	2.3189	0.61	Q			V	
23+35	2.3231	0.61	Q			V	
23+40	2.3273	0.61	Q			V	
23+45	2.3315	0.60	Q			V	
23+50	2.3356	0.60	Q			V	
23+55	2.3397	0.60	Q			V	
24+ 0	2.3438	0.59	Q			V	
24+ 5	2.3476	0.56	Q			V	
24+10	2.3501	0.36	Q			V	
24+15	2.3510	0.12	Q			V	
24+20	2.3512	0.03	Q			V	

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   24+25        2.3512       0.01  Q          |          |          |        V|
   24+30        2.3513       0.00  Q          |          |          |        V|
-----------------------------------------------------------------------
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U n i t   H y d r o g r a p h   A n a l y s i s

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT AREA A7
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
2.25	1	1.20
Rainfall data for year 100		
2.25	6	3.00
Rainfall data for year 100		
2.25	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	2.25	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.23	0.100	56.0	56.0	7.86	0.266
2.02	0.900	98.0	98.0	0.20	0.960

Area-averaged catchment yield fraction, Y = 0.891
Area-averaged low loss fraction, Yb = 0.109
User entry of time of concentration = 0.135 (hours)
+++
Watershed area = 2.25(Ac.)
Catchment Lag time = 0.108 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 77.1605
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 2.25(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.200(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(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 = 27.21 (CFS))	
1	10.561	2.874
2	60.970	13.717
3	92.932	8.697
4	98.645	1.555
5	100.000	0.369

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6891	0.1032
4	0.7732	0.0840
5	0.8454	0.0722

6	0.9093	0.0640
7	0.9672	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1155	0.0460
11	1.1588	0.0433
12	1.1999	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3449	0.0466
16	1.3901	0.0451
17	1.4339	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5150	0.0253
52	2.5401	0.0251
53	2.5649	0.0249
54	2.5896	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6622	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8020	0.0228
64	2.8246	0.0227

65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5882	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8406	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160

124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2131	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137
169	4.5962	0.0136
170	4.6098	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6771	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131

183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4199	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114

242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5902	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8737	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9687	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094

8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114

67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156

126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0403	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430

185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0640	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4441	0.0061	0.4380
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128

244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

Total soil rain loss = 0.59(In)
Total effective rainfall = 5.41(In)
Peak flow rate in flood hydrograph = 7.59(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS) 0 2.5 5.0 7.5 10.0

```
-----------------------------------------------------------------------
  0+ 5       0.0002      0.03  Q         |         |         |         |
  0+10       0.0012      0.15  Q         |         |         |         |
  0+15       0.0029      0.24  Q         |         |         |         |
  0+20       0.0046      0.25  VQ        |         |         |         |
  0+25       0.0063      0.25  VQ        |         |         |         |
  0+30       0.0081      0.26  VQ        |         |         |         |
  0+35       0.0099      0.26  VQ        |         |         |         |
  0+40       0.0116      0.26  VQ        |         |         |         |
  0+45       0.0134      0.26  VQ        |         |         |         |
  0+50       0.0152      0.26  VQ        |         |         |         |
  0+55       0.0170      0.26  VQ        |         |         |         |
  1+ 0       0.0187      0.26  VQ        |         |         |         |
  1+ 5       0.0205      0.26  VQ        |         |         |         |
  1+10       0.0223      0.26  VQ        |         |         |         |
  1+15       0.0241      0.26  VQ        |         |         |         |
  1+20       0.0259      0.26  |Q        |         |         |         |
  1+25       0.0277      0.26  |Q        |         |         |         |
  1+30       0.0296      0.26  |Q        |         |         |         |
  1+35       0.0314      0.26  |Q        |         |         |         |
  1+40       0.0332      0.27  |Q        |         |         |         |
  1+45       0.0350      0.27  |Q        |         |         |         |
  1+50       0.0369      0.27  |Q        |         |         |         |
  1+55       0.0387      0.27  |Q        |         |         |         |
  2+ 0       0.0406      0.27  |Q        |         |         |         |
  2+ 5       0.0424      0.27  |Q        |         |         |         |
  2+10       0.0443      0.27  |Q        |         |         |         |
  2+15       0.0461      0.27  |Q        |         |         |         |
  2+20       0.0480      0.27  |Q        |         |         |         |
  2+25       0.0499      0.27  |Q        |         |         |         |
  2+30       0.0518      0.27  |QV       |         |         |         |
  2+35       0.0536      0.27  |QV       |         |         |         |
  2+40       0.0555      0.27  |QV       |         |         |         |
  2+45       0.0574      0.28  |QV       |         |         |         |
  2+50       0.0593      0.28  |QV       |         |         |         |
  2+55       0.0612      0.28  |QV       |         |         |         |
  3+ 0       0.0632      0.28  |QV       |         |         |         |
  3+ 5       0.0651      0.28  |QV       |         |         |         |
  3+10       0.0670      0.28  |QV       |         |         |         |
  3+15       0.0689      0.28  |QV       |         |         |         |
  3+20       0.0709      0.28  |QV       |         |         |         |
  3+25       0.0728      0.28  |QV       |         |         |         |
  3+30       0.0748      0.28  |QV       |         |         |         |
  3+35       0.0767      0.28  |Q V      |         |         |         |
  3+40       0.0787      0.29  |Q V      |         |         |         |
  3+45       0.0807      0.29  |Q V      |         |         |         |
  3+50       0.0827      0.29  |Q V      |         |         |         |
  3+55       0.0847      0.29  |Q V      |         |         |         |
  4+ 0       0.0866      0.29  |Q V      |         |         |         |
  4+ 5       0.0886      0.29  |Q V      |         |         |         |
  4+10       0.0907      0.29  |Q V      |         |         |         |
  4+15       0.0927      0.29  |Q V      |         |         |         |
  4+20       0.0947      0.29  |Q V      |         |         |         |
  4+25       0.0967      0.29  |Q V      |         |         |         |
  4+30       0.0987      0.30  |Q V      |         |         |         |
  4+35       0.1008      0.30  |Q V      |         |         |         |
  4+40       0.1028      0.30  |Q  V     |         |         |         |
  4+45       0.1049      0.30  |Q  V     |         |         |         |
  4+50       0.1070      0.30  |Q  V     |         |         |         |
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4+55	0.1090	0.30	Q V				
5+ 0	0.1111	0.30	Q V				
5+ 5	0.1132	0.30	Q V				
5+10	0.1153	0.30	Q V				
5+15	0.1174	0.31	Q V				
5+20	0.1195	0.31	Q V				
5+25	0.1216	0.31	Q V				
5+30	0.1238	0.31	Q V				
5+35	0.1259	0.31	Q V				
5+40	0.1280	0.31	Q V				
5+45	0.1302	0.31	Q V				
5+50	0.1324	0.31	Q V				
5+55	0.1345	0.32	Q V				
6+ 0	0.1367	0.32	Q V				
6+ 5	0.1389	0.32	Q V				
6+10	0.1411	0.32	Q V				
6+15	0.1433	0.32	Q V				
6+20	0.1455	0.32	Q V				
6+25	0.1477	0.32	Q V				
6+30	0.1500	0.32	Q V				
6+35	0.1522	0.33	Q V				
6+40	0.1545	0.33	Q V				
6+45	0.1568	0.33	Q V				
6+50	0.1590	0.33	Q V				
6+55	0.1613	0.33	Q V				
7+ 0	0.1636	0.33	Q V				
7+ 5	0.1659	0.33	Q V				
7+10	0.1682	0.34	Q V				
7+15	0.1706	0.34	Q V				
7+20	0.1729	0.34	Q V				
7+25	0.1752	0.34	Q V				
7+30	0.1776	0.34	Q V				
7+35	0.1800	0.34	Q V				
7+40	0.1824	0.35	Q V				
7+45	0.1848	0.35	Q V				
7+50	0.1872	0.35	Q V				
7+55	0.1896	0.35	Q V				
8+ 0	0.1920	0.35	Q V				
8+ 5	0.1945	0.35	Q V				
8+10	0.1969	0.36	Q V				
8+15	0.1994	0.36	Q V				
8+20	0.2019	0.36	Q V				
8+25	0.2044	0.36	Q V				
8+30	0.2069	0.36	Q V				
8+35	0.2094	0.37	Q V				
8+40	0.2119	0.37	Q V				
8+45	0.2145	0.37	Q V				
8+50	0.2171	0.37	Q V				
8+55	0.2196	0.37	Q V				
9+ 0	0.2222	0.38	Q V				
9+ 5	0.2248	0.38	Q V				
9+10	0.2275	0.38	Q V				
9+15	0.2301	0.38	Q V				
9+20	0.2328	0.39	Q V				
9+25	0.2354	0.39	Q V				
9+30	0.2381	0.39	Q V				
9+35	0.2408	0.39	Q V				
9+40	0.2436	0.40	Q V				
9+45	0.2463	0.40	Q V				

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 9+50       0.2491      0.40  |Q       V|         |         |         |
 9+55       0.2518      0.40  |Q       V|         |         |         |
10+ 0       0.2546      0.41  |Q        V         |         |         |
10+ 5       0.2575      0.41  |Q        V         |         |         |
10+10       0.2603      0.41  |Q        V         |         |         |
10+15       0.2632      0.41  |Q        V         |         |         |
10+20       0.2660      0.42  |Q        V         |         |         |
10+25       0.2689      0.42  |Q        V         |         |         |
10+30       0.2718      0.42  |Q        V         |         |         |
10+35       0.2748      0.43  |Q        V         |         |         |
10+40       0.2777      0.43  |Q        V         |         |         |
10+45       0.2807      0.43  |Q        |V        |         |         |
10+50       0.2837      0.44  |Q        |V        |         |         |
10+55       0.2868      0.44  |Q        |V        |         |         |
11+ 0       0.2898      0.44  |Q        |V        |         |         |
11+ 5       0.2929      0.45  |Q        |V        |         |         |
11+10       0.2960      0.45  |Q        |V        |         |         |
11+15       0.2991      0.45  |Q        |V        |         |         |
11+20       0.3023      0.46  |Q        |V        |         |         |
11+25       0.3055      0.46  |Q        | V       |         |         |
11+30       0.3087      0.47  |Q        | V       |         |         |
11+35       0.3119      0.47  |Q        | V       |         |         |
11+40       0.3152      0.48  |Q        | V       |         |         |
11+45       0.3185      0.48  |Q        | V       |         |         |
11+50       0.3219      0.48  |Q        | V       |         |         |
11+55       0.3252      0.49  |Q        | V       |         |         |
12+ 0       0.3286      0.49  |Q        | V       |         |         |
12+ 5       0.3321      0.50  |Q        |  V      |         |         |
12+10       0.3356      0.51  | Q       |  V      |         |         |
12+15       0.3392      0.52  | Q       |  V      |         |         |
12+20       0.3428      0.53  | Q       |  V      |         |         |
12+25       0.3465      0.53  | Q       |  V      |         |         |
12+30       0.3502      0.54  | Q       |  V      |         |         |
12+35       0.3539      0.54  | Q       |  V      |         |         |
12+40       0.3577      0.55  | Q       |   V     |         |         |
12+45       0.3615      0.56  | Q       |   V     |         |         |
12+50       0.3654      0.56  | Q       |   V     |         |         |
12+55       0.3693      0.57  | Q       |   V     |         |         |
13+ 0       0.3733      0.58  | Q       |   V     |         |         |
13+ 5       0.3774      0.58  | Q       |   V     |         |         |
13+10       0.3814      0.59  | Q       |    V    |         |         |
13+15       0.3856      0.60  | Q       |    V    |         |         |
13+20       0.3898      0.61  | Q       |    V    |         |         |
13+25       0.3940      0.62  | Q       |    V    |         |         |
13+30       0.3984      0.63  | Q       |    V    |         |         |
13+35       0.4028      0.64  | Q       |    V    |         |         |
13+40       0.4072      0.65  | Q       |     V   |         |         |
13+45       0.4118      0.66  | Q       |     V   |         |         |
13+50       0.4164      0.67  | Q       |     V   |         |         |
13+55       0.4211      0.68  | Q       |     V   |         |         |
14+ 0       0.4258      0.69  | Q       |     V   |         |         |
14+ 5       0.4307      0.71  | Q       |     V   |         |         |
14+10       0.4357      0.72  | Q       |      V  |         |         |
14+15       0.4408      0.74  | Q       |      V  |         |         |
14+20       0.4460      0.75  |  Q      |      V  |         |         |
14+25       0.4513      0.77  |  Q      |      V  |         |         |
14+30       0.4567      0.79  |  Q      |       V |         |         |
14+35       0.4623      0.81  |  Q      |       V |         |         |
14+40       0.4680      0.83  |  Q      |       V |         |         |
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14+45	0.4739	0.85	Q	V		
14+50	0.4799	0.88	Q	V		
14+55	0.4862	0.91	Q	V		
15+ 0	0.4926	0.94	Q	V		
15+ 5	0.4993	0.97	Q	V		
15+10	0.5063	1.01	Q	V		
15+15	0.5135	1.05	Q		V	
15+20	0.5211	1.10	Q		V	
15+25	0.5289	1.13	Q		V	
15+30	0.5363	1.07	Q		V	
15+35	0.5435	1.06	Q		V	
15+40	0.5514	1.15	Q		V	
15+45	0.5602	1.27	Q		V	
15+50	0.5704	1.48	Q		V	
15+55	0.5826	1.78	Q		V	
16+ 0	0.5992	2.40	Q		V	
16+ 5	0.6273	4.09		Q	V	
16+10	0.6796	7.59			V	Q
16+15	0.7159	5.27			Q V	
16+20	0.7313	2.24	Q		V	
16+25	0.7411	1.42	Q		V	
16+30	0.7493	1.19	Q		V	
16+35	0.7571	1.13	Q		V	
16+40	0.7642	1.04	Q			V
16+45	0.7709	0.96	Q			V
16+50	0.7771	0.90	Q			V
16+55	0.7829	0.85	Q			V
17+ 0	0.7884	0.80	Q			V
17+ 5	0.7937	0.76	Q			V
17+10	0.7987	0.73	Q			V
17+15	0.8036	0.70	Q			V
17+20	0.8082	0.68	Q			V
17+25	0.8127	0.65	Q			V
17+30	0.8171	0.63	Q			V
17+35	0.8214	0.62	Q			V
17+40	0.8255	0.60	Q			V
17+45	0.8295	0.58	Q			V
17+50	0.8334	0.57	Q			V
17+55	0.8372	0.55	Q			V
18+ 0	0.8409	0.54	Q			V
18+ 5	0.8446	0.53	Q			V
18+10	0.8481	0.51	Q			V
18+15	0.8515	0.50	Q			V
18+20	0.8549	0.49	Q			V
18+25	0.8582	0.48	Q			V
18+30	0.8614	0.47	Q			V
18+35	0.8646	0.46	Q			V
18+40	0.8677	0.45	Q			V
18+45	0.8708	0.45	Q			V
18+50	0.8738	0.44	Q			V
18+55	0.8768	0.43	Q			V
19+ 0	0.8797	0.43	Q			V
19+ 5	0.8826	0.42	Q			V
19+10	0.8855	0.41	Q			V
19+15	0.8883	0.41	Q			V
19+20	0.8910	0.40	Q			V
19+25	0.8938	0.40	Q			V
19+30	0.8965	0.39	Q			V
19+35	0.8991	0.39	Q			V

19+40	0.9018	0.38	Q			V
19+45	0.9044	0.38	Q			V
19+50	0.9070	0.37	Q			V
19+55	0.9095	0.37	Q			V
20+ 0	0.9120	0.37	Q			V
20+ 5	0.9145	0.36	Q			V
20+10	0.9170	0.36	Q			V
20+15	0.9194	0.35	Q			V
20+20	0.9218	0.35	Q			V
20+25	0.9242	0.35	Q			V
20+30	0.9266	0.34	Q			V
20+35	0.9289	0.34	Q			V
20+40	0.9313	0.34	Q			V
20+45	0.9336	0.33	Q			V
20+50	0.9358	0.33	Q			V
20+55	0.9381	0.33	Q			V
21+ 0	0.9404	0.33	Q			V
21+ 5	0.9426	0.32	Q			V
21+10	0.9448	0.32	Q			V
21+15	0.9470	0.32	Q			V
21+20	0.9491	0.31	Q			V
21+25	0.9513	0.31	Q			V
21+30	0.9534	0.31	Q			V
21+35	0.9555	0.31	Q			V
21+40	0.9576	0.31	Q			V
21+45	0.9597	0.30	Q			V
21+50	0.9618	0.30	Q			V
21+55	0.9638	0.30	Q			V
22+ 0	0.9659	0.30	Q			V
22+ 5	0.9679	0.29	Q			V
22+10	0.9699	0.29	Q			V
22+15	0.9719	0.29	Q			V
22+20	0.9739	0.29	Q			V
22+25	0.9759	0.29	Q			V
22+30	0.9778	0.28	Q			V
22+35	0.9798	0.28	Q			V
22+40	0.9817	0.28	Q			V
22+45	0.9836	0.28	Q			V
22+50	0.9855	0.28	Q			V
22+55	0.9874	0.28	Q			V
23+ 0	0.9893	0.27	Q			V
23+ 5	0.9912	0.27	Q			V
23+10	0.9930	0.27	Q			V
23+15	0.9949	0.27	Q			V
23+20	0.9967	0.27	Q			V
23+25	0.9986	0.27	Q			V
23+30	1.0004	0.26	Q			V
23+35	1.0022	0.26	Q			V
23+40	1.0040	0.26	Q			V
23+45	1.0058	0.26	Q			V
23+50	1.0076	0.26	Q			V
23+55	1.0093	0.26	Q			V
24+ 0	1.0111	0.26	Q			V
24+ 5	1.0126	0.23	Q			V
24+10	1.0133	0.10	Q			V
24+15	1.0135	0.02	Q			V
24+20	1.0135	0.00	Q			V

APPENDIX C.3: UNIT HYDROGRAPH ANALYSIS, AREAS "B"

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA B1
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.26	1	1.20
Rainfall data for year 100		
4.26	6	3.00
Rainfall data for year 100		
4.26	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	4.26	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.43	0.100	56.0	56.0	7.86	0.266
3.83	0.900	98.0	98.0	0.20	0.960

Area-averaged catchment yield fraction, Y = 0.891
Area-averaged low loss fraction, Yb = 0.109
User entry of time of concentration = 0.131 (hours)
++
Watershed area = 4.26(Ac.)
Catchment Lag time = 0.105 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 79.5165
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 4.26(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.200(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(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 = 51.52 (CFS))	
1	11.179	5.759
2	63.305	26.855
3	93.805	15.714
4	98.810	2.578
5	100.000	0.613

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4440	0.4440
2	0.5859	0.1419
3	0.6891	0.1032
4	0.7731	0.0840
5	0.8453	0.0722

6	0.9092	0.0639
7	0.9671	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1154	0.0460
11	1.1587	0.0433
12	1.1998	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3900	0.0451
17	1.4338	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7104	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4120	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227

65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9211	0.0160

124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131

183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114

242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094

8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114

67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156

126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430

185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128

244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =     14.63(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

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

```
-----------------------------------------------------------------------
  0+ 5        0.0004      0.05  Q        |         |         |         |
  0+10        0.0025      0.30  Q        |         |         |         |
  0+15        0.0056      0.45  Q        |         |         |         |
  0+20        0.0088      0.47  Q        |         |         |         |
  0+25        0.0121      0.48  Q        |         |         |         |
  0+30        0.0155      0.48  Q        |         |         |         |
  0+35        0.0188      0.48  Q        |         |         |         |
  0+40        0.0221      0.49  Q        |         |         |         |
  0+45        0.0255      0.49  Q        |         |         |         |
  0+50        0.0289      0.49  Q        |         |         |         |
  0+55        0.0322      0.49  Q        |         |         |         |
  1+ 0        0.0356      0.49  Q        |         |         |         |
  1+ 5        0.0390      0.49  Q        |         |         |         |
  1+10        0.0424      0.49  Q        |         |         |         |
  1+15        0.0458      0.49  Q        |         |         |         |
  1+20        0.0492      0.50  QV       |         |         |         |
  1+25        0.0527      0.50  QV       |         |         |         |
  1+30        0.0561      0.50  QV       |         |         |         |
  1+35        0.0595      0.50  |Q       |         |         |         |
  1+40        0.0630      0.50  |Q       |         |         |         |
  1+45        0.0665      0.50  |Q       |         |         |         |
  1+50        0.0699      0.50  |Q       |         |         |         |
  1+55        0.0734      0.51  |Q       |         |         |         |
  2+ 0        0.0769      0.51  |Q       |         |         |         |
  2+ 5        0.0804      0.51  |Q       |         |         |         |
  2+10        0.0840      0.51  |Q       |         |         |         |
  2+15        0.0875      0.51  |Q       |         |         |         |
  2+20        0.0910      0.51  |Q       |         |         |         |
  2+25        0.0946      0.52  |Q       |         |         |         |
  2+30        0.0981      0.52  |QV      |         |         |         |
  2+35        0.1017      0.52  |QV      |         |         |         |
  2+40        0.1053      0.52  |QV      |         |         |         |
  2+45        0.1089      0.52  |QV      |         |         |         |
  2+50        0.1125      0.52  |QV      |         |         |         |
  2+55        0.1161      0.53  |QV      |         |         |         |
  3+ 0        0.1197      0.53  |QV      |         |         |         |
  3+ 5        0.1234      0.53  |QV      |         |         |         |
  3+10        0.1270      0.53  |QV      |         |         |         |
  3+15        0.1307      0.53  |QV      |         |         |         |
  3+20        0.1344      0.53  |QV      |         |         |         |
  3+25        0.1380      0.54  |QV      |         |         |         |
  3+30        0.1417      0.54  |QV      |         |         |         |
  3+35        0.1455      0.54  |Q V     |         |         |         |
  3+40        0.1492      0.54  |Q V     |         |         |         |
  3+45        0.1529      0.54  |Q V     |         |         |         |
  3+50        0.1567      0.54  |Q V     |         |         |         |
  3+55        0.1604      0.55  |Q V     |         |         |         |
  4+ 0        0.1642      0.55  |Q V     |         |         |         |
  4+ 5        0.1680      0.55  |Q V     |         |         |         |
  4+10        0.1718      0.55  |Q V     |         |         |         |
  4+15        0.1756      0.55  |Q V     |         |         |         |
  4+20        0.1794      0.56  |Q V     |         |         |         |
  4+25        0.1833      0.56  |Q V     |         |         |         |
  4+30        0.1871      0.56  |Q V     |         |         |         |
  4+35        0.1910      0.56  |Q V     |         |         |         |
  4+40        0.1949      0.56  |Q  V    |         |         |         |
  4+45        0.1988      0.57  |Q  V    |         |         |         |
  4+50        0.2027      0.57  |Q  V    |         |         |         |
```

4+55	0.2066	0.57	Q V			
5+ 0	0.2105	0.57	Q V			
5+ 5	0.2145	0.57	Q V			
5+10	0.2185	0.58	Q V			
5+15	0.2224	0.58	Q V			
5+20	0.2264	0.58	Q V			
5+25	0.2305	0.58	Q V			
5+30	0.2345	0.59	Q V			
5+35	0.2385	0.59	Q V			
5+40	0.2426	0.59	Q V			
5+45	0.2467	0.59	Q V			
5+50	0.2508	0.59	Q V			
5+55	0.2549	0.60	Q V			
6+ 0	0.2590	0.60	Q V			
6+ 5	0.2632	0.60	Q V			
6+10	0.2673	0.60	Q V			
6+15	0.2715	0.61	Q V			
6+20	0.2757	0.61	Q V			
6+25	0.2799	0.61	Q V			
6+30	0.2841	0.61	Q V			
6+35	0.2884	0.62	Q V			
6+40	0.2927	0.62	Q V			
6+45	0.2970	0.62	Q V			
6+50	0.3013	0.63	Q V			
6+55	0.3056	0.63	Q V			
7+ 0	0.3099	0.63	Q V			
7+ 5	0.3143	0.63	Q V			
7+10	0.3187	0.64	Q V			
7+15	0.3231	0.64	Q V			
7+20	0.3275	0.64	Q V			
7+25	0.3320	0.65	Q V			
7+30	0.3364	0.65	Q V			
7+35	0.3409	0.65	Q V			
7+40	0.3455	0.66	Q V			
7+45	0.3500	0.66	Q V			
7+50	0.3545	0.66	Q V			
7+55	0.3591	0.67	Q V			
8+ 0	0.3637	0.67	Q V			
8+ 5	0.3684	0.67	Q V			
8+10	0.3730	0.68	Q V			
8+15	0.3777	0.68	Q V			
8+20	0.3824	0.68	Q V			
8+25	0.3871	0.69	Q V			
8+30	0.3919	0.69	Q V			
8+35	0.3967	0.69	Q V			
8+40	0.4015	0.70	Q V			
8+45	0.4063	0.70	Q V			
8+50	0.4112	0.71	Q V			
8+55	0.4160	0.71	Q V			
9+ 0	0.4210	0.71	Q V			
9+ 5	0.4259	0.72	Q V			
9+10	0.4309	0.72	Q V			
9+15	0.4359	0.73	Q V			
9+20	0.4409	0.73	Q V			
9+25	0.4460	0.74	Q V			
9+30	0.4511	0.74	Q V			
9+35	0.4562	0.74	Q V			
9+40	0.4614	0.75	Q V			
9+45	0.4666	0.75	Q V			

9+50	0.4718	0.76	Q V			
9+55	0.4770	0.76	Q V			
10+ 0	0.4823	0.77	Q V			
10+ 5	0.4877	0.77	Q V			
10+10	0.4930	0.78	Q V			
10+15	0.4985	0.79	Q V			
10+20	0.5039	0.79	Q V			
10+25	0.5094	0.80	Q V			
10+30	0.5149	0.80	Q V			
10+35	0.5205	0.81	Q V			
10+40	0.5261	0.81	Q V			
10+45	0.5317	0.82	Q	V		
10+50	0.5374	0.83	Q	V		
10+55	0.5432	0.83	Q	V		
11+ 0	0.5490	0.84	Q	V		
11+ 5	0.5548	0.85	Q	V		
11+10	0.5607	0.85	Q	V		
11+15	0.5666	0.86	Q	V		
11+20	0.5726	0.87	Q	V		
11+25	0.5786	0.88	Q	V		
11+30	0.5847	0.88	Q	V		
11+35	0.5909	0.89	Q	V		
11+40	0.5971	0.90	Q	V		
11+45	0.6033	0.91	Q	V		
11+50	0.6096	0.92	Q	V		
11+55	0.6160	0.93	Q	V		
12+ 0	0.6225	0.94	Q	V		
12+ 5	0.6290	0.95	Q	V		
12+10	0.6357	0.97	Q	V		
12+15	0.6424	0.98	Q	V		
12+20	0.6493	1.00	Q	V		
12+25	0.6562	1.01	Q	V		
12+30	0.6633	1.02	Q	V		
12+35	0.6704	1.03	Q	V		
12+40	0.6775	1.04	Q	V		
12+45	0.6848	1.05	Q	V		
12+50	0.6922	1.07	Q	V		
12+55	0.6996	1.08	Q	V		
13+ 0	0.7071	1.09	Q	V		
13+ 5	0.7148	1.11	Q	V		
13+10	0.7225	1.12	Q	V		
13+15	0.7303	1.14	Q	V		
13+20	0.7383	1.16	Q	V		
13+25	0.7464	1.17	Q	V		
13+30	0.7546	1.19	Q	V		
13+35	0.7629	1.21	Q	V		
13+40	0.7713	1.23	Q	V		
13+45	0.7799	1.25	Q	V		
13+50	0.7887	1.27	Q	V		
13+55	0.7976	1.29	Q	V		
14+ 0	0.8066	1.32	Q	V		
14+ 5	0.8159	1.34	Q	V		
14+10	0.8253	1.37	Q	V		
14+15	0.8349	1.40	Q	V		
14+20	0.8448	1.43	Q	V		
14+25	0.8548	1.46	Q	V		
14+30	0.8651	1.50	Q	V		
14+35	0.8757	1.53	Q	V		
14+40	0.8865	1.58	Q	V		

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14+45       0.8977      1.62  |  Q      |       V |         |         |
14+50       0.9091      1.67  |  Q      |       V |         |         |
14+55       0.9210      1.72  |  Q      |        V|         |         |
15+ 0       0.9332      1.78  |  Q      |        V|         |         |
15+ 5       0.9459      1.84  |  Q      |        V|         |         |
15+10       0.9591      1.92  |  Q      |        V|         |         |
15+15       0.9729      2.00  |  Q      |         V         |         |
15+20       0.9873      2.10  |   Q     |         V         |         |
15+25       1.0021      2.14  |   Q     |         V         |         |
15+30       1.0159      2.01  |   Q     |         |V        |         |
15+35       1.0297      2.00  |   Q     |         |V        |         |
15+40       1.0447      2.18  |   Q     |         |V        |         |
15+45       1.0613      2.41  |   Q     |         | V       |         |
15+50       1.0807      2.81  |    Q    |         | V       |         |
15+55       1.1040      3.39  |     Q   |         |  V      |         |
16+ 0       1.1357      4.60  |        Q|         |  V      |         |
16+ 5       1.1901      7.90  |         |    Q    |   V     |         |
16+10       1.2909     14.63  |         |         |     V  Q|         |
16+15       1.3576      9.68  |         |        Q|       V |         |
16+20       1.3856      4.06  |       Q |         |       V |         |
16+25       1.4038      2.64  |    Q    |         |        V|         |
16+30       1.4193      2.26  |   Q     |         |        V|         |
16+35       1.4340      2.13  |   Q     |         |        V|         |
16+40       1.4475      1.96  |  Q      |         |         V         |
16+45       1.4600      1.82  |  Q      |         |         V         |
16+50       1.4717      1.70  |  Q      |         |         V         |
16+55       1.4827      1.60  |  Q      |         |         V         |
17+ 0       1.4931      1.52  |  Q      |         |         |V        |
17+ 5       1.5031      1.45  | Q       |         |         |V        |
17+10       1.5126      1.38  | Q       |         |         |V        |
17+15       1.5218      1.33  | Q       |         |         |V        |
17+20       1.5306      1.28  | Q       |         |         |V        |
17+25       1.5391      1.24  | Q       |         |         | V       |
17+30       1.5474      1.20  | Q       |         |         | V       |
17+35       1.5554      1.16  | Q       |         |         | V       |
17+40       1.5632      1.13  | Q       |         |         | V       |
17+45       1.5708      1.10  | Q       |         |         | V       |
17+50       1.5782      1.07  | Q       |         |         | V       |
17+55       1.5854      1.05  | Q       |         |         |  V      |
18+ 0       1.5925      1.02  | Q       |         |         |  V      |
18+ 5       1.5993      1.00  | Q       |         |         |  V      |
18+10       1.6060      0.97  |Q        |         |         |  V      |
18+15       1.6125      0.94  |Q        |         |         |  V      |
18+20       1.6188      0.92  |Q        |         |         |  V      |
18+25       1.6251      0.90  |Q        |         |         |  V      |
18+30       1.6312      0.89  |Q        |         |         |   V     |
18+35       1.6372      0.87  |Q        |         |         |   V     |
18+40       1.6431      0.86  |Q        |         |         |   V     |
18+45       1.6489      0.84  |Q        |         |         |   V     |
18+50       1.6546      0.83  |Q        |         |         |   V     |
18+55       1.6603      0.82  |Q        |         |         |   V     |
19+ 0       1.6658      0.81  |Q        |         |         |   V     |
19+ 5       1.6713      0.79  |Q        |         |         |   V     |
19+10       1.6767      0.78  |Q        |         |         |   V     |
19+15       1.6820      0.77  |Q        |         |         |    V    |
19+20       1.6872      0.76  |Q        |         |         |    V    |
19+25       1.6924      0.75  |Q        |         |         |    V    |
19+30       1.6975      0.74  |Q        |         |         |    V    |
19+35       1.7026      0.73  |Q        |         |         |    V    |
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19+40	1.7076	0.72	Q			V
19+45	1.7125	0.72	Q			V
19+50	1.7174	0.71	Q			V
19+55	1.7222	0.70	Q			V
20+ 0	1.7270	0.69	Q			V
20+ 5	1.7317	0.68	Q			V
20+10	1.7363	0.68	Q			V
20+15	1.7409	0.67	Q			V
20+20	1.7455	0.66	Q			V
20+25	1.7500	0.66	Q			V
20+30	1.7545	0.65	Q			V
20+35	1.7590	0.64	Q			V
20+40	1.7634	0.64	Q			V
20+45	1.7677	0.63	Q			V
20+50	1.7720	0.63	Q			V
20+55	1.7763	0.62	Q			V
21+ 0	1.7806	0.62	Q			V
21+ 5	1.7848	0.61	Q			V
21+10	1.7889	0.61	Q			V
21+15	1.7931	0.60	Q			V
21+20	1.7972	0.60	Q			V
21+25	1.8012	0.59	Q			V
21+30	1.8053	0.59	Q			V
21+35	1.8093	0.58	Q			V
21+40	1.8133	0.58	Q			V
21+45	1.8172	0.57	Q			V
21+50	1.8211	0.57	Q			V
21+55	1.8250	0.56	Q			V
22+ 0	1.8289	0.56	Q			V
22+ 5	1.8327	0.56	Q			V
22+10	1.8365	0.55	Q			V
22+15	1.8403	0.55	Q			V
22+20	1.8441	0.55	Q			V
22+25	1.8478	0.54	Q			V
22+30	1.8515	0.54	Q			V
22+35	1.8552	0.53	Q			V
22+40	1.8588	0.53	Q			V
22+45	1.8625	0.53	Q			V
22+50	1.8661	0.52	Q			V
22+55	1.8697	0.52	Q			V
23+ 0	1.8732	0.52	Q			V
23+ 5	1.8768	0.51	Q			V
23+10	1.8803	0.51	Q			V
23+15	1.8838	0.51	Q			V
23+20	1.8873	0.51	Q			V
23+25	1.8907	0.50	Q			V
23+30	1.8942	0.50	Q			V
23+35	1.8976	0.50	Q			V
23+40	1.9010	0.49	Q			V
23+45	1.9044	0.49	Q			V
23+50	1.9078	0.49	Q			V
23+55	1.9111	0.49	Q			V
24+ 0	1.9144	0.48	Q			V
24+ 5	1.9174	0.43	Q			V
24+10	1.9186	0.18	Q			V
24+15	1.9188	0.03	Q			V
24+20	1.9188	0.01	Q			V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA B2
100-YEAR 24 HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
1.61	1	1.20
Rainfall data for year 100		
1.61	6	3.00
Rainfall data for year 100		
1.61	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	1.61	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.16   0.100          56.0      56.0      7.86     0.266
     1.45   0.900          98.0      98.0      0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.095 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       1.61(Ac.)
Catchment Lag time =   0.076 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 109.6491
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       1.61(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        19.47 (CFS))

  1               20.403                    3.973
  2               84.528                   12.486
  3               98.652                    2.750
  4              100.000                    0.262
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.4441               0.4441
  2              0.5860               0.1419
  3              0.6892               0.1032
  4              0.7732               0.0840
  5              0.8454               0.0722
  6              0.9094               0.0640
```

7	0.9672	0.0578
8	1.0203	0.0531
9	1.0695	0.0492
10	1.1155	0.0460
11	1.1589	0.0433
12	1.1999	0.0410
13	1.2501	0.0501
14	1.2983	0.0483
15	1.3450	0.0466
16	1.3901	0.0451
17	1.4339	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5582	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7105	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8167	0.0347
28	1.8508	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9497	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1926	0.0289
40	2.2211	0.0286
41	2.2494	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5150	0.0253
52	2.5401	0.0251
53	2.5649	0.0249
54	2.5896	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6622	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8020	0.0228
64	2.8246	0.0227
65	2.8471	0.0225

66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2404	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5532	0.0176
102	3.5707	0.0175
103	3.5882	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8406	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159

125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2131	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3157	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5139	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137
169	4.5962	0.0136
170	4.6098	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6503	0.0135
174	4.6637	0.0134
175	4.6771	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131
183	4.7828	0.0131

184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8348	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2082	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3852	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4199	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114

243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5453	0.0113
247	5.5565	0.0113
248	5.5678	0.0112
249	5.5790	0.0112
250	5.5902	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8737	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9687	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095

9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115

68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157

127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0403	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366

186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0640	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4441	0.0061	0.4380
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0321
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127

245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =      6.18(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
              R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
```

0+ 5	0.0003	0.04	Q				
0+10	0.0013	0.15	Q				
0+15	0.0025	0.18	Q				
0+20	0.0038	0.18	Q				
0+25	0.0050	0.18	Q				
0+30	0.0063	0.18	Q				
0+35	0.0076	0.18	Q				
0+40	0.0088	0.18	Q				
0+45	0.0101	0.18	Q				
0+50	0.0114	0.18	Q				
0+55	0.0126	0.19	Q				
1+ 0	0.0139	0.19	Q				
1+ 5	0.0152	0.19	Q				
1+10	0.0165	0.19	Q				
1+15	0.0178	0.19	Q				
1+20	0.0191	0.19	QV				
1+25	0.0204	0.19	QV				
1+30	0.0217	0.19	QV				
1+35	0.0230	0.19	QV				
1+40	0.0243	0.19	QV				
1+45	0.0256	0.19	QV				
1+50	0.0269	0.19	QV				
1+55	0.0282	0.19	QV				
2+ 0	0.0296	0.19	QV				
2+ 5	0.0309	0.19	QV				
2+10	0.0322	0.19	QV				
2+15	0.0335	0.19	QV				
2+20	0.0349	0.19	QV				
2+25	0.0362	0.20	QV				
2+30	0.0376	0.20	Q V				
2+35	0.0389	0.20	Q V				
2+40	0.0403	0.20	Q V				
2+45	0.0416	0.20	Q V				
2+50	0.0430	0.20	Q V				
2+55	0.0444	0.20	Q V				
3+ 0	0.0458	0.20	Q V				
3+ 5	0.0471	0.20	Q V				
3+10	0.0485	0.20	Q V				
3+15	0.0499	0.20	Q V				
3+20	0.0513	0.20	Q V				
3+25	0.0527	0.20	Q V				
3+30	0.0541	0.20	Q V				
3+35	0.0555	0.20	Q V				
3+40	0.0569	0.20	Q V				
3+45	0.0583	0.21	Q V				
3+50	0.0597	0.21	Q V				
3+55	0.0611	0.21	Q V				
4+ 0	0.0626	0.21	Q V				
4+ 5	0.0640	0.21	Q V				
4+10	0.0654	0.21	Q V				
4+15	0.0669	0.21	Q V				
4+20	0.0683	0.21	Q V				
4+25	0.0698	0.21	Q V				
4+30	0.0713	0.21	Q V				
4+35	0.0727	0.21	Q V				
4+40	0.0742	0.21	Q V				
4+45	0.0757	0.21	Q V				
4+50	0.0771	0.21	Q V				
4+55	0.0786	0.22	Q V				

```
5+ 0       0.0801      0.22  Q   V     |         |         |         |
5+ 5       0.0816      0.22  Q   V     |         |         |         |
5+10       0.0831      0.22  Q   V     |         |         |         |
5+15       0.0846      0.22  Q   V     |         |         |         |
5+20       0.0861      0.22  Q   V     |         |         |         |
5+25       0.0877      0.22  Q   V     |         |         |         |
5+30       0.0892      0.22  Q   V     |         |         |         |
5+35       0.0907      0.22  Q    V    |         |         |         |
5+40       0.0922      0.22  Q    V    |         |         |         |
5+45       0.0938      0.22  Q    V    |         |         |         |
5+50       0.0953      0.23  Q    V    |         |         |         |
5+55       0.0969      0.23  Q    V    |         |         |         |
6+ 0       0.0985      0.23  Q    V    |         |         |         |
6+ 5       0.1000      0.23  Q    V    |         |         |         |
6+10       0.1016      0.23  Q    V    |         |         |         |
6+15       0.1032      0.23  Q    V    |         |         |         |
6+20       0.1048      0.23  Q    V    |         |         |         |
6+25       0.1064      0.23  Q    V    |         |         |         |
6+30       0.1080      0.23  Q    V    |         |         |         |
6+35       0.1096      0.23  Q     V   |         |         |         |
6+40       0.1112      0.23  Q     V   |         |         |         |
6+45       0.1128      0.24  Q     V   |         |         |         |
6+50       0.1145      0.24  Q     V   |         |         |         |
6+55       0.1161      0.24  Q     V   |         |         |         |
7+ 0       0.1177      0.24  Q     V   |         |         |         |
7+ 5       0.1194      0.24  Q     V   |         |         |         |
7+10       0.1210      0.24  Q     V   |         |         |         |
7+15       0.1227      0.24  Q     V   |         |         |         |
7+20       0.1244      0.24  Q     V   |         |         |         |
7+25       0.1261      0.24  Q     V   |         |         |         |
7+30       0.1278      0.25  Q      V  |         |         |         |
7+35       0.1295      0.25  Q      V  |         |         |         |
7+40       0.1312      0.25  Q      V  |         |         |         |
7+45       0.1329      0.25  Q      V  |         |         |         |
7+50       0.1346      0.25  |Q     V  |         |         |         |
7+55       0.1364      0.25  |Q     V  |         |         |         |
8+ 0       0.1381      0.25  |Q     V  |         |         |         |
8+ 5       0.1399      0.25  |Q     V  |         |         |         |
8+10       0.1416      0.26  |Q     V  |         |         |         |
8+15       0.1434      0.26  |Q     V  |         |         |         |
8+20       0.1452      0.26  |Q      V |         |         |         |
8+25       0.1470      0.26  |Q      V |         |         |         |
8+30       0.1488      0.26  |Q      V |         |         |         |
8+35       0.1506      0.26  |Q      V |         |         |         |
8+40       0.1524      0.26  |Q      V |         |         |         |
8+45       0.1542      0.27  |Q      V |         |         |         |
8+50       0.1561      0.27  |Q      V |         |         |         |
8+55       0.1579      0.27  |Q      V |         |         |         |
9+ 0       0.1598      0.27  |Q      V |         |         |         |
9+ 5       0.1616      0.27  |Q      V |         |         |         |
9+10       0.1635      0.27  |Q       V|         |         |         |
9+15       0.1654      0.28  |Q       V|         |         |         |
9+20       0.1673      0.28  |Q       V|         |         |         |
9+25       0.1692      0.28  |Q       V|         |         |         |
9+30       0.1712      0.28  |Q       V|         |         |         |
9+35       0.1731      0.28  |Q       V|         |         |         |
9+40       0.1751      0.28  |Q       V|         |         |         |
9+45       0.1770      0.29  |Q       V|         |         |         |
9+50       0.1790      0.29  |Q       V|         |         |         |
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 9+55      0.1810      0.29   |Q       V|         |         |         |
10+ 0      0.1830      0.29   |Q        V         |         |         |
10+ 5      0.1850      0.29   |Q        V         |         |         |
10+10      0.1871      0.30   |Q        V         |         |         |
10+15      0.1891      0.30   |Q        V         |         |         |
10+20      0.1912      0.30   |Q        V         |         |         |
10+25      0.1933      0.30   |Q        V         |         |         |
10+30      0.1954      0.30   |Q        V         |         |         |
10+35      0.1975      0.31   |Q        V         |         |         |
10+40      0.1996      0.31   |Q        |V        |         |         |
10+45      0.2017      0.31   |Q        |V        |         |         |
10+50      0.2039      0.31   |Q        |V        |         |         |
10+55      0.2061      0.32   |Q        |V        |         |         |
11+ 0      0.2083      0.32   |Q        |V        |         |         |
11+ 5      0.2105      0.32   |Q        |V        |         |         |
11+10      0.2127      0.32   |Q        |V        |         |         |
11+15      0.2150      0.33   |Q        |V        |         |         |
11+20      0.2172      0.33   |Q        |V        |         |         |
11+25      0.2195      0.33   |Q        | V       |         |         |
11+30      0.2218      0.34   |Q        | V       |         |         |
11+35      0.2242      0.34   |Q        | V       |         |         |
11+40      0.2265      0.34   |Q        | V       |         |         |
11+45      0.2289      0.34   |Q        | V       |         |         |
11+50      0.2313      0.35   |Q        | V       |         |         |
11+55      0.2337      0.35   |Q        | V       |         |         |
12+ 0      0.2361      0.36   |Q        |  V      |         |         |
12+ 5      0.2386      0.36   |Q        |  V      |         |         |
12+10      0.2412      0.37   |Q        |  V      |         |         |
12+15      0.2437      0.37   |Q        |  V      |         |         |
12+20      0.2463      0.38   |Q        |  V      |         |         |
12+25      0.2490      0.38   |Q        |  V      |         |         |
12+30      0.2516      0.39   |Q        |  V      |         |         |
12+35      0.2543      0.39   |Q        |   V     |         |         |
12+40      0.2571      0.40   |Q        |   V     |         |         |
12+45      0.2598      0.40   |Q        |   V     |         |         |
12+50      0.2626      0.41   |Q        |   V     |         |         |
12+55      0.2654      0.41   |Q        |   V     |         |         |
13+ 0      0.2683      0.42   |Q        |   V     |         |         |
13+ 5      0.2712      0.42   |Q        |   V     |         |         |
13+10      0.2741      0.43   |Q        |    V    |         |         |
13+15      0.2771      0.43   |Q        |    V    |         |         |
13+20      0.2801      0.44   |Q        |    V    |         |         |
13+25      0.2832      0.44   |Q        |    V    |         |         |
13+30      0.2863      0.45   |Q        |    V    |         |         |
13+35      0.2895      0.46   |Q        |    V    |         |         |
13+40      0.2927      0.47   |Q        |     V   |         |         |
13+45      0.2960      0.47   |Q        |     V   |         |         |
13+50      0.2993      0.48   |Q        |     V   |         |         |
13+55      0.3027      0.49   |Q        |     V   |         |         |
14+ 0      0.3061      0.50   | Q       |     V   |         |         |
14+ 5      0.3096      0.51   | Q       |      V  |         |         |
14+10      0.3132      0.52   | Q       |      V  |         |         |
14+15      0.3169      0.53   | Q       |      V  |         |         |
14+20      0.3206      0.54   | Q       |      V  |         |         |
14+25      0.3245      0.56   | Q       |      V  |         |         |
14+30      0.3284      0.57   | Q       |       V |         |         |
14+35      0.3324      0.58   | Q       |       V |         |         |
14+40      0.3366      0.60   | Q       |       V |         |         |
14+45      0.3408      0.62   | Q       |       V |         |         |
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14+50       0.3452      0.64  | Q       |        V|         |         |
14+55       0.3497      0.66  | Q       |        V|         |         |
15+ 0       0.3544      0.68  | Q       |        V|         |         |
15+ 5       0.3593      0.70  | Q       |        V|         |         |
15+10       0.3643      0.74  | Q       |         V         |         |
15+15       0.3696      0.77  |  Q      |         V         |         |
15+20       0.3752      0.81  |  Q      |         V         |         |
15+25       0.3807      0.81  |  Q      |         V         |         |
15+30       0.3858      0.74  | Q       |         |V        |         |
15+35       0.3911      0.77  |  Q      |         |V        |         |
15+40       0.3970      0.85  |  Q      |         |V        |         |
15+45       0.4035      0.95  |  Q      |         | V       |         |
15+50       0.4113      1.13  |   Q     |         | V       |         |
15+55       0.4208      1.38  |    Q    |         |  V      |         |
16+ 0       0.4342      1.95  |      Q  |         |  V      |         |
16+ 5       0.4598      3.72  |         |   Q     |    V    |         |
16+10       0.5024      6.18  |         |         |   Q  V  |         |
16+15       0.5190      2.42  |        Q|         |       V |         |
16+20       0.5268      1.14  |   Q     |         |        V|         |
16+25       0.5327      0.85  |  Q      |         |        V|         |
16+30       0.5385      0.84  |  Q      |         |        V|         |
16+35       0.5439      0.78  |  Q      |         |         V         |
16+40       0.5489      0.72  | Q       |         |         V         |
16+45       0.5535      0.67  | Q       |         |         V         |
16+50       0.5578      0.63  | Q       |         |         V         |
16+55       0.5618      0.59  | Q       |         |         V         |
17+ 0       0.5657      0.56  | Q       |         |         |V        |
17+ 5       0.5694      0.54  | Q       |         |         |V        |
17+10       0.5730      0.51  | Q       |         |         |V        |
17+15       0.5764      0.50  |Q        |         |         |V        |
17+20       0.5797      0.48  |Q        |         |         |V        |
17+25       0.5829      0.46  |Q        |         |         | V       |
17+30       0.5859      0.45  |Q        |         |         | V       |
17+35       0.5889      0.44  |Q        |         |         | V       |
17+40       0.5919      0.42  |Q        |         |         | V       |
17+45       0.5947      0.41  |Q        |         |         | V       |
17+50       0.5975      0.40  |Q        |         |         | V       |
17+55       0.6002      0.39  |Q        |         |         |  V      |
18+ 0       0.6028      0.38  |Q        |         |         |  V      |
18+ 5       0.6054      0.37  |Q        |         |         |  V      |
18+10       0.6079      0.36  |Q        |         |         |  V      |
18+15       0.6103      0.35  |Q        |         |         |  V      |
18+20       0.6127      0.35  |Q        |         |         |  V      |
18+25       0.6150      0.34  |Q        |         |         |  V      |
18+30       0.6173      0.33  |Q        |         |         |   V     |
18+35       0.6196      0.33  |Q        |         |         |   V     |
18+40       0.6218      0.32  |Q        |         |         |   V     |
18+45       0.6240      0.32  |Q        |         |         |   V     |
18+50       0.6261      0.31  |Q        |         |         |   V     |
18+55       0.6282      0.31  |Q        |         |         |   V     |
19+ 0       0.6303      0.30  |Q        |         |         |   V     |
19+ 5       0.6324      0.30  |Q        |         |         |   V     |
19+10       0.6344      0.29  |Q        |         |         |   V     |
19+15       0.6364      0.29  |Q        |         |         |    V    |
19+20       0.6384      0.29  |Q        |         |         |    V    |
19+25       0.6403      0.28  |Q        |         |         |    V    |
19+30       0.6423      0.28  |Q        |         |         |    V    |
19+35       0.6442      0.28  |Q        |         |         |    V    |
19+40       0.6460      0.27  |Q        |         |         |    V    |
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  19+45      0.6479      0.27  |Q        |         |         |    V    |
  19+50      0.6497      0.27  |Q        |         |         |    V    |
  19+55      0.6515      0.26  |Q        |         |         |    V    |
  20+ 0      0.6533      0.26  |Q        |         |         |     V   |
  20+ 5      0.6551      0.26  |Q        |         |         |     V   |
  20+10      0.6569      0.26  |Q        |         |         |     V   |
  20+15      0.6586      0.25  |Q        |         |         |     V   |
  20+20      0.6603      0.25  Q         |         |         |     V   |
  20+25      0.6620      0.25  Q         |         |         |     V   |
  20+30      0.6637      0.25  Q         |         |         |     V   |
  20+35      0.6654      0.24  Q         |         |         |     V   |
  20+40      0.6670      0.24  Q         |         |         |     V   |
  20+45      0.6687      0.24  Q         |         |         |     V   |
  20+50      0.6703      0.24  Q         |         |         |     V   |
  20+55      0.6719      0.23  Q         |         |         |      V  |
  21+ 0      0.6735      0.23  Q         |         |         |      V  |
  21+ 5      0.6751      0.23  Q         |         |         |      V  |
  21+10      0.6767      0.23  Q         |         |         |      V  |
  21+15      0.6782      0.23  Q         |         |         |      V  |
  21+20      0.6798      0.22  Q         |         |         |      V  |
  21+25      0.6813      0.22  Q         |         |         |      V  |
  21+30      0.6828      0.22  Q         |         |         |      V  |
  21+35      0.6843      0.22  Q         |         |         |      V  |
  21+40      0.6858      0.22  Q         |         |         |      V  |
  21+45      0.6873      0.22  Q         |         |         |      V  |
  21+50      0.6888      0.21  Q         |         |         |      V  |
  21+55      0.6903      0.21  Q         |         |         |       V |
  22+ 0      0.6917      0.21  Q         |         |         |       V |
  22+ 5      0.6932      0.21  Q         |         |         |       V |
  22+10      0.6946      0.21  Q         |         |         |       V |
  22+15      0.6960      0.21  Q         |         |         |       V |
  22+20      0.6975      0.21  Q         |         |         |       V |
  22+25      0.6989      0.20  Q         |         |         |       V |
  22+30      0.7003      0.20  Q         |         |         |       V |
  22+35      0.7016      0.20  Q         |         |         |       V |
  22+40      0.7030      0.20  Q         |         |         |       V |
  22+45      0.7044      0.20  Q         |         |         |       V |
  22+50      0.7058      0.20  Q         |         |         |       V |
  22+55      0.7071      0.20  Q         |         |         |        V|
  23+ 0      0.7085      0.20  Q         |         |         |        V|
  23+ 5      0.7098      0.19  Q         |         |         |        V|
  23+10      0.7111      0.19  Q         |         |         |        V|
  23+15      0.7124      0.19  Q         |         |         |        V|
  23+20      0.7138      0.19  Q         |         |         |        V|
  23+25      0.7151      0.19  Q         |         |         |        V|
  23+30      0.7164      0.19  Q         |         |         |        V|
  23+35      0.7176      0.19  Q         |         |         |        V|
  23+40      0.7189      0.19  Q         |         |         |        V|
  23+45      0.7202      0.19  Q         |         |         |        V|
  23+50      0.7215      0.18  Q         |         |         |        V|
  23+55      0.7227      0.18  Q         |         |         |        V|
  24+ 0      0.7240      0.18  Q         |         |         |        V|
  24+ 5      0.7250      0.14  Q         |         |         |        V|
  24+10      0.7252      0.03  Q         |         |         |        V|
  24+15      0.7252      0.00  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA B3
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
5.30	1	1.20
Rainfall data for year 100		
5.30	6	3.00
Rainfall data for year 100		
5.30	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	5.30	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.53   0.100          56.0      56.0       7.86     0.266
     4.77   0.900          98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.156 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       5.30(Ac.)
Catchment Lag time =   0.125 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 66.7735
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       5.30(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph         Unit Hydrograph
Number            Mean values           ((CFS))
---------------------------------------------------------------------
            (K =        64.10 (CFS))

  1                8.016                   5.138
  2               49.840                  26.808
  3               87.198                  23.945
  4               97.393                   6.535
  5               99.209                   1.164
  6              100.000                   0.507
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number             (In)                 (In)
  1              0.4440               0.4440
  2              0.5859               0.1419
  3              0.6890               0.1032
  4              0.7731               0.0840
```

5	0.8453	0.0722
6	0.9092	0.0639
7	0.9670	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1153	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2498	0.0501
14	1.2981	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4762	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8165	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9171	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228

64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1224	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4820	0.0180
98	3.4999	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7080	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160

123	3.9210	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4440	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132

182	4.7696	0.0131
183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114

241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6678	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9476	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094

7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114

66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155

125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415

184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0970
192	0.1419	0.0061	0.1358
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130

243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

Total soil rain loss = 0.59(In)
Total effective rainfall = 5.41(In)
Peak flow rate in flood hydrograph = 16.13(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0         5.0       10.0       15.0       20.0
--------------------------------------------------------------------------
  0+ 5       0.0003      0.05  Q          |          |          |          |
  0+10       0.0024      0.30  Q          |          |          |          |
  0+15       0.0060      0.52  VQ         |          |          |          |
  0+20       0.0100      0.58  VQ         |          |          |          |
  0+25       0.0141      0.59  VQ         |          |          |          |
  0+30       0.0182      0.60  VQ         |          |          |          |
  0+35       0.0223      0.60  VQ         |          |          |          |
  0+40       0.0265      0.60  VQ         |          |          |          |
  0+45       0.0307      0.61  VQ         |          |          |          |
  0+50       0.0348      0.61  VQ         |          |          |          |
  0+55       0.0390      0.61  VQ         |          |          |          |
  1+ 0       0.0432      0.61  VQ         |          |          |          |
  1+ 5       0.0474      0.61  VQ         |          |          |          |
  1+10       0.0517      0.61  VQ         |          |          |          |
  1+15       0.0559      0.62  VQ         |          |          |          |
  1+20       0.0602      0.62  |Q         |          |          |          |
  1+25       0.0644      0.62  |Q         |          |          |          |
  1+30       0.0687      0.62  |Q         |          |          |          |
  1+35       0.0730      0.62  |Q         |          |          |          |
  1+40       0.0773      0.62  |Q         |          |          |          |
  1+45       0.0816      0.63  |Q         |          |          |          |
  1+50       0.0859      0.63  |Q         |          |          |          |
  1+55       0.0903      0.63  |Q         |          |          |          |
  2+ 0       0.0946      0.63  |Q         |          |          |          |
  2+ 5       0.0990      0.63  |Q         |          |          |          |
  2+10       0.1033      0.64  |Q         |          |          |          |
  2+15       0.1077      0.64  |Q         |          |          |          |
  2+20       0.1121      0.64  |Q         |          |          |          |
  2+25       0.1165      0.64  |Q         |          |          |          |
  2+30       0.1210      0.64  |QV        |          |          |          |
  2+35       0.1254      0.64  |QV        |          |          |          |
  2+40       0.1299      0.65  |QV        |          |          |          |
  2+45       0.1343      0.65  |QV        |          |          |          |
  2+50       0.1388      0.65  |QV        |          |          |          |
  2+55       0.1433      0.65  |QV        |          |          |          |
  3+ 0       0.1478      0.65  |QV        |          |          |          |
  3+ 5       0.1523      0.66  |QV        |          |          |          |
  3+10       0.1569      0.66  |QV        |          |          |          |
  3+15       0.1614      0.66  |QV        |          |          |          |
  3+20       0.1660      0.66  |QV        |          |          |          |
  3+25       0.1706      0.67  |QV        |          |          |          |
  3+30       0.1752      0.67  |QV        |          |          |          |
  3+35       0.1798      0.67  |Q V       |          |          |          |
  3+40       0.1844      0.67  |Q V       |          |          |          |
  3+45       0.1891      0.67  |Q V       |          |          |          |
  3+50       0.1937      0.68  |Q V       |          |          |          |
  3+55       0.1984      0.68  |Q V       |          |          |          |
  4+ 0       0.2031      0.68  |Q V       |          |          |          |
  4+ 5       0.2078      0.68  |Q V       |          |          |          |
  4+10       0.2125      0.69  |Q V       |          |          |          |
  4+15       0.2173      0.69  |Q V       |          |          |          |
  4+20       0.2220      0.69  |Q V       |          |          |          |
  4+25       0.2268      0.69  |Q V       |          |          |          |
  4+30       0.2316      0.70  |Q V       |          |          |          |
  4+35       0.2364      0.70  |Q V       |          |          |          |
  4+40       0.2412      0.70  |Q  V      |          |          |          |
  4+45       0.2461      0.70  |Q  V      |          |          |          |
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4+50	0.2509	0.71	Q V				
4+55	0.2558	0.71	Q V				
5+ 0	0.2607	0.71	Q V				
5+ 5	0.2656	0.71	Q V				
5+10	0.2705	0.72	Q V				
5+15	0.2755	0.72	Q V				
5+20	0.2805	0.72	Q V				
5+25	0.2855	0.72	Q V				
5+30	0.2905	0.73	Q V				
5+35	0.2955	0.73	Q V				
5+40	0.3005	0.73	Q V				
5+45	0.3056	0.74	Q V				
5+50	0.3107	0.74	Q V				
5+55	0.3158	0.74	Q V				
6+ 0	0.3209	0.74	Q V				
6+ 5	0.3261	0.75	Q V				
6+10	0.3313	0.75	Q V				
6+15	0.3365	0.75	Q V				
6+20	0.3417	0.76	Q V				
6+25	0.3469	0.76	Q V				
6+30	0.3522	0.76	Q V				
6+35	0.3575	0.77	Q V				
6+40	0.3628	0.77	Q V				
6+45	0.3681	0.77	Q V				
6+50	0.3734	0.78	Q V				
6+55	0.3788	0.78	Q V				
7+ 0	0.3842	0.78	Q V				
7+ 5	0.3897	0.79	Q V				
7+10	0.3951	0.79	Q V				
7+15	0.4006	0.80	Q V				
7+20	0.4061	0.80	Q V				
7+25	0.4116	0.80	Q V				
7+30	0.4172	0.81	Q V				
7+35	0.4227	0.81	Q V				
7+40	0.4284	0.81	Q V				
7+45	0.4340	0.82	Q V				
7+50	0.4397	0.82	Q V				
7+55	0.4454	0.83	Q V				
8+ 0	0.4511	0.83	Q V				
8+ 5	0.4568	0.84	Q V				
8+10	0.4626	0.84	Q V				
8+15	0.4684	0.84	Q V				
8+20	0.4743	0.85	Q V				
8+25	0.4801	0.85	Q V				
8+30	0.4860	0.86	Q V				
8+35	0.4920	0.86	Q V				
8+40	0.4979	0.87	Q V				
8+45	0.5039	0.87	Q V				
8+50	0.5100	0.88	Q V				
8+55	0.5161	0.88	Q V				
9+ 0	0.5222	0.89	Q V				
9+ 5	0.5283	0.89	Q V				
9+10	0.5345	0.90	Q V				
9+15	0.5407	0.90	Q V				
9+20	0.5470	0.91	Q V				
9+25	0.5532	0.91	Q V				
9+30	0.5596	0.92	Q V				
9+35	0.5659	0.92	Q V				
9+40	0.5724	0.93	Q V				

```
  9+45      0.5788      0.94  |Q       V|         |         |         |
  9+50      0.5853      0.94  |Q       V|         |         |         |
  9+55      0.5918      0.95  |Q       V|         |         |         |
 10+ 0      0.5984      0.96  |Q        V         |         |         |
 10+ 5      0.6050      0.96  |Q        V         |         |         |
 10+10      0.6117      0.97  |Q        V         |         |         |
 10+15      0.6184      0.98  |Q        V         |         |         |
 10+20      0.6252      0.98  |Q        V         |         |         |
 10+25      0.6320      0.99  |Q        V         |         |         |
 10+30      0.6389      1.00  |Q        V         |         |         |
 10+35      0.6458      1.00  | Q       V         |         |         |
 10+40      0.6528      1.01  | Q       V         |         |         |
 10+45      0.6598      1.02  | Q       |V        |         |         |
 10+50      0.6668      1.03  | Q       |V        |         |         |
 10+55      0.6740      1.03  | Q       |V        |         |         |
 11+ 0      0.6812      1.04  | Q       |V        |         |         |
 11+ 5      0.6884      1.05  | Q       |V        |         |         |
 11+10      0.6957      1.06  | Q       |V        |         |         |
 11+15      0.7031      1.07  | Q       |V        |         |         |
 11+20      0.7105      1.08  | Q       |V        |         |         |
 11+25      0.7180      1.09  | Q       | V       |         |         |
 11+30      0.7255      1.10  | Q       | V       |         |         |
 11+35      0.7332      1.11  | Q       | V       |         |         |
 11+40      0.7409      1.12  | Q       | V       |         |         |
 11+45      0.7486      1.13  | Q       | V       |         |         |
 11+50      0.7565      1.14  | Q       | V       |         |         |
 11+55      0.7644      1.15  | Q       | V       |         |         |
 12+ 0      0.7724      1.16  | Q       | V       |         |         |
 12+ 5      0.7805      1.17  | Q       |  V      |         |         |
 12+10      0.7887      1.20  | Q       |  V      |         |         |
 12+15      0.7971      1.22  | Q       |  V      |         |         |
 12+20      0.8057      1.24  | Q       |  V      |         |         |
 12+25      0.8143      1.25  | Q       |  V      |         |         |
 12+30      0.8230      1.26  | Q       |  V      |         |         |
 12+35      0.8318      1.28  | Q       |  V      |         |         |
 12+40      0.8407      1.29  | Q       |   V     |         |         |
 12+45      0.8497      1.31  | Q       |   V     |         |         |
 12+50      0.8588      1.32  | Q       |   V     |         |         |
 12+55      0.8680      1.34  | Q       |   V     |         |         |
 13+ 0      0.8774      1.36  | Q       |   V     |         |         |
 13+ 5      0.8868      1.37  | Q       |   V     |         |         |
 13+10      0.8964      1.39  | Q       |    V    |         |         |
 13+15      0.9062      1.41  | Q       |    V    |         |         |
 13+20      0.9160      1.43  | Q       |    V    |         |         |
 13+25      0.9260      1.45  | Q       |    V    |         |         |
 13+30      0.9362      1.47  | Q       |    V    |         |         |
 13+35      0.9465      1.50  | Q       |    V    |         |         |
 13+40      0.9570      1.52  |  Q      |     V   |         |         |
 13+45      0.9676      1.55  |  Q      |     V   |         |         |
 13+50      0.9784      1.57  |  Q      |     V   |         |         |
 13+55      0.9895      1.60  |  Q      |     V   |         |         |
 14+ 0      1.0007      1.63  |  Q      |     V   |         |         |
 14+ 5      1.0121      1.66  |  Q      |     V   |         |         |
 14+10      1.0238      1.69  |  Q      |      V  |         |         |
 14+15      1.0357      1.73  |  Q      |      V  |         |         |
 14+20      1.0479      1.77  |  Q      |      V  |         |         |
 14+25      1.0603      1.81  |  Q      |      V  |         |         |
 14+30      1.0731      1.85  |  Q      |      V  |         |         |
 14+35      1.0861      1.90  |  Q      |       V |         |         |
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14+40       1.0995      1.95  |  Q      |       V |         |         |
14+45       1.1133      2.00  |  Q      |       V |         |         |
14+50       1.1275      2.06  |   Q     |       V |         |         |
14+55       1.1421      2.12  |   Q     |        V|         |         |
15+ 0       1.1572      2.19  |   Q     |        V|         |         |
15+ 5       1.1728      2.27  |   Q     |        V|         |         |
15+10       1.1891      2.36  |   Q     |        V|         |         |
15+15       1.2060      2.46  |   Q     |         V         |         |
15+20       1.2238      2.58  |    Q    |         V         |         |
15+25       1.2421      2.65  |    Q    |         V         |         |
15+30       1.2596      2.54  |    Q    |         |V        |         |
15+35       1.2767      2.49  |   Q     |         |V        |         |
15+40       1.2950      2.65  |    Q    |         |V        |         |
15+45       1.3152      2.93  |    Q    |         | V       |         |
15+50       1.3384      3.37  |     Q   |         | V       |         |
15+55       1.3662      4.03  |       Q |         | V       |         |
16+ 0       1.4029      5.34  |         Q         |  V      |         |
16+ 5       1.4631      8.74  |         |      Q  |   V     |         |
16+10       1.5742     16.13  |         |         |     V   | Q       |
16+15       1.6697     13.87  |         |         |      Q  |         |
16+20       1.7147      6.53  |         |  Q      |       V |         |
16+25       1.7399      3.65  |      Q  |         |        V|         |
16+30       1.7608      3.04  |     Q   |         |        V|         |
16+35       1.7794      2.71  |    Q    |         |        V|         |
16+40       1.7966      2.49  |   Q     |         |         V         |
16+45       1.8124      2.30  |   Q     |         |         V         |
16+50       1.8272      2.15  |   Q     |         |         V         |
16+55       1.8412      2.02  |   Q     |         |         V         |
17+ 0       1.8543      1.91  |  Q      |         |         |V        |
17+ 5       1.8669      1.82  |  Q      |         |         |V        |
17+10       1.8789      1.74  |  Q      |         |         |V        |
17+15       1.8904      1.67  |  Q      |         |         |V        |
17+20       1.9015      1.61  |  Q      |         |         |V        |
17+25       1.9122      1.55  |  Q      |         |         | V       |
17+30       1.9225      1.50  |  Q      |         |         | V       |
17+35       1.9326      1.46  | Q       |         |         | V       |
17+40       1.9423      1.42  | Q       |         |         | V       |
17+45       1.9518      1.38  | Q       |         |         | V       |
17+50       1.9611      1.34  | Q       |         |         | V       |
17+55       1.9702      1.31  | Q       |         |         |  V      |
18+ 0       1.9790      1.28  | Q       |         |         |  V      |
18+ 5       1.9876      1.25  | Q       |         |         |  V      |
18+10       1.9960      1.21  | Q       |         |         |  V      |
18+15       2.0041      1.18  | Q       |         |         |  V      |
18+20       2.0120      1.15  | Q       |         |         |  V      |
18+25       2.0198      1.13  | Q       |         |         |  V      |
18+30       2.0275      1.11  | Q       |         |         |  V      |
18+35       2.0350      1.09  | Q       |         |         |   V     |
18+40       2.0424      1.07  | Q       |         |         |   V     |
18+45       2.0496      1.05  | Q       |         |         |   V     |
18+50       2.0568      1.04  | Q       |         |         |   V     |
18+55       2.0638      1.02  | Q       |         |         |   V     |
19+ 0       2.0707      1.01  | Q       |         |         |   V     |
19+ 5       2.0776      0.99  |Q        |         |         |   V     |
19+10       2.0843      0.98  |Q        |         |         |   V     |
19+15       2.0909      0.96  |Q        |         |         |    V    |
19+20       2.0975      0.95  |Q        |         |         |    V    |
19+25       2.1039      0.94  |Q        |         |         |    V    |
19+30       2.1103      0.93  |Q        |         |         |    V    |
```

19+35	2.1166	0.92	Q				V
19+40	2.1228	0.90	Q				V
19+45	2.1290	0.89	Q				V
19+50	2.1351	0.88	Q				V
19+55	2.1411	0.87	Q				V
20+ 0	2.1470	0.86	Q				V
20+ 5	2.1529	0.85	Q				V
20+10	2.1587	0.84	Q				V
20+15	2.1645	0.84	Q				V
20+20	2.1702	0.83	Q				V
20+25	2.1758	0.82	Q				V
20+30	2.1814	0.81	Q				V
20+35	2.1870	0.80	Q				V
20+40	2.1925	0.80	Q				V
20+45	2.1979	0.79	Q				V
20+50	2.2033	0.78	Q				V
20+55	2.2086	0.77	Q				V
21+ 0	2.2139	0.77	Q				V
21+ 5	2.2191	0.76	Q				V
21+10	2.2243	0.76	Q				V
21+15	2.2295	0.75	Q				V
21+20	2.2346	0.74	Q				V
21+25	2.2397	0.74	Q				V
21+30	2.2447	0.73	Q				V
21+35	2.2497	0.73	Q				V
21+40	2.2547	0.72	Q				V
21+45	2.2596	0.71	Q				V
21+50	2.2645	0.71	Q				V
21+55	2.2693	0.70	Q				V
22+ 0	2.2741	0.70	Q				V
22+ 5	2.2789	0.69	Q				V
22+10	2.2837	0.69	Q				V
22+15	2.2884	0.68	Q				V
22+20	2.2931	0.68	Q				V
22+25	2.2977	0.67	Q				V
22+30	2.3023	0.67	Q				V
22+35	2.3069	0.67	Q				V
22+40	2.3115	0.66	Q				V
22+45	2.3160	0.66	Q				V
22+50	2.3205	0.65	Q				V
22+55	2.3250	0.65	Q				V
23+ 0	2.3294	0.65	Q				V
23+ 5	2.3338	0.64	Q				V
23+10	2.3382	0.64	Q				V
23+15	2.3426	0.63	Q				V
23+20	2.3469	0.63	Q				V
23+25	2.3512	0.63	Q				V
23+30	2.3555	0.62	Q				V
23+35	2.3598	0.62	Q				V
23+40	2.3640	0.62	Q				V
23+45	2.3682	0.61	Q				V
23+50	2.3724	0.61	Q				V
23+55	2.3766	0.61	Q				V
24+ 0	2.3808	0.60	Q				V
24+ 5	2.3846	0.55	Q				V
24+10	2.3866	0.30	Q				V
24+15	2.3871	0.08	Q				V
24+20	2.3873	0.02	Q				V
24+25	2.3873	0.00	Q				V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA B4
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
3.16	1	1.20
Rainfall data for year 100		
3.16	6	3.00
Rainfall data for year 100		
3.16	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	3.16	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.32   0.100          56.0      56.0       7.86     0.266
     2.84   0.900          98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.120 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       3.16(Ac.)
Catchment Lag time =   0.096 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 86.8056
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       3.16(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
----------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
----------------------------------------------------------------------
            (K =        38.22 (CFS))

  1               13.176                   5.035
  2               69.924                  21.687
  3               95.818                   9.896
  4               99.265                   1.317
  5              100.000                   0.281
----------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number             (In)                  (In)
  1              0.4441                0.4441
  2              0.5859                0.1419
  3              0.6891                0.1032
  4              0.7732                0.0840
  5              0.8453                0.0722
```

6	0.9093	0.0640
7	0.9671	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1154	0.0460
11	1.1588	0.0433
12	1.1998	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3449	0.0466
16	1.3900	0.0451
17	1.4338	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6359	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227

65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160

124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131

183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114

242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094

8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114

67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156

126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0403	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430

185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0640	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4441	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128

244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
---------------------------------------------------------------------
---------------------------------------------------------------------
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =     11.38(CFS)
----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

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

0+ 5	0.0003	0.05	Q
0+10	0.0020	0.25	Q
0+15	0.0044	0.34	Q
0+20	0.0068	0.35	Q
0+25	0.0093	0.36	Q
0+30	0.0117	0.36	Q
0+35	0.0142	0.36	Q
0+40	0.0167	0.36	Q
0+45	0.0192	0.36	Q
0+50	0.0217	0.36	Q
0+55	0.0242	0.36	Q
1+ 0	0.0267	0.36	Q
1+ 5	0.0292	0.37	Q
1+10	0.0317	0.37	Q
1+15	0.0343	0.37	Q
1+20	0.0368	0.37	QV
1+25	0.0393	0.37	QV
1+30	0.0419	0.37	QV
1+35	0.0444	0.37	QV
1+40	0.0470	0.37	QV
1+45	0.0496	0.37	QV
1+50	0.0522	0.37	QV
1+55	0.0548	0.38	QV
2+ 0	0.0574	0.38	QV
2+ 5	0.0600	0.38	QV
2+10	0.0626	0.38	QV
2+15	0.0652	0.38	QV
2+20	0.0678	0.38	QV
2+25	0.0704	0.38	QV
2+30	0.0731	0.38	Q V
2+35	0.0757	0.38	Q V
2+40	0.0784	0.39	Q V
2+45	0.0811	0.39	Q V
2+50	0.0837	0.39	Q V
2+55	0.0864	0.39	Q V
3+ 0	0.0891	0.39	Q V
3+ 5	0.0918	0.39	Q V
3+10	0.0945	0.39	Q V
3+15	0.0972	0.39	Q V
3+20	0.1000	0.40	Q V
3+25	0.1027	0.40	Q V
3+30	0.1054	0.40	Q V
3+35	0.1082	0.40	Q V
3+40	0.1110	0.40	Q V
3+45	0.1137	0.40	Q V
3+50	0.1165	0.40	Q V
3+55	0.1193	0.41	Q V
4+ 0	0.1221	0.41	Q V
4+ 5	0.1249	0.41	Q V
4+10	0.1277	0.41	Q V
4+15	0.1306	0.41	Q V
4+20	0.1334	0.41	Q V
4+25	0.1363	0.41	Q V
4+30	0.1391	0.42	Q V
4+35	0.1420	0.42	Q V
4+40	0.1449	0.42	Q V
4+45	0.1478	0.42	Q V
4+50	0.1507	0.42	Q V

4+55	0.1536	0.42	Q V
5+ 0	0.1565	0.42	Q V
5+ 5	0.1594	0.43	Q V
5+10	0.1624	0.43	Q V
5+15	0.1653	0.43	Q V
5+20	0.1683	0.43	Q V
5+25	0.1713	0.43	Q V
5+30	0.1743	0.43	Q V
5+35	0.1773	0.44	Q V
5+40	0.1803	0.44	Q V
5+45	0.1833	0.44	Q V
5+50	0.1864	0.44	Q V
5+55	0.1894	0.44	Q V
6+ 0	0.1925	0.44	Q V
6+ 5	0.1955	0.45	Q V
6+10	0.1986	0.45	Q V
6+15	0.2017	0.45	Q V
6+20	0.2049	0.45	Q V
6+25	0.2080	0.45	Q V
6+30	0.2111	0.46	Q V
6+35	0.2143	0.46	Q V
6+40	0.2174	0.46	Q V
6+45	0.2206	0.46	Q V
6+50	0.2238	0.46	Q V
6+55	0.2270	0.47	Q V
7+ 0	0.2303	0.47	Q V
7+ 5	0.2335	0.47	Q V
7+10	0.2368	0.47	Q V
7+15	0.2400	0.47	Q V
7+20	0.2433	0.48	Q V
7+25	0.2466	0.48	Q V
7+30	0.2499	0.48	Q V
7+35	0.2533	0.48	Q V
7+40	0.2566	0.49	Q V
7+45	0.2600	0.49	Q V
7+50	0.2634	0.49	Q V
7+55	0.2668	0.49	Q V
8+ 0	0.2702	0.50	Q V
8+ 5	0.2736	0.50	Q V
8+10	0.2771	0.50	|Q V
8+15	0.2806	0.50	|Q V
8+20	0.2840	0.51	|Q V
8+25	0.2875	0.51	|Q V
8+30	0.2911	0.51	|Q V
8+35	0.2946	0.51	|Q V
8+40	0.2982	0.52	|Q V
8+45	0.3018	0.52	|Q V
8+50	0.3054	0.52	|Q V
8+55	0.3090	0.53	|Q V
9+ 0	0.3127	0.53	|Q V
9+ 5	0.3163	0.53	|Q V
9+10	0.3200	0.54	|Q V
9+15	0.3237	0.54	|Q V
9+20	0.3275	0.54	|Q V
9+25	0.3312	0.55	|Q V
9+30	0.3350	0.55	|Q V
9+35	0.3388	0.55	|Q V
9+40	0.3427	0.56	|Q V
9+45	0.3465	0.56	|Q V

9+50	0.3504	0.56	Q V			
9+55	0.3543	0.57	Q V			
10+ 0	0.3582	0.57	Q V			
10+ 5	0.3622	0.57	Q V			
10+10	0.3662	0.58	Q V			
10+15	0.3702	0.58	Q V			
10+20	0.3742	0.59	Q V			
10+25	0.3783	0.59	Q V			
10+30	0.3824	0.60	Q V			
10+35	0.3865	0.60	Q V			
10+40	0.3907	0.60	Q V			
10+45	0.3949	0.61	Q	V		
10+50	0.3991	0.61	Q	V		
10+55	0.4034	0.62	Q	V		
11+ 0	0.4077	0.62	Q	V		
11+ 5	0.4120	0.63	Q	V		
11+10	0.4164	0.63	Q	V		
11+15	0.4208	0.64	Q	V		
11+20	0.4252	0.65	Q	V		
11+25	0.4297	0.65	Q	V		
11+30	0.4342	0.66	Q	V		
11+35	0.4388	0.66	Q	V		
11+40	0.4434	0.67	Q	V		
11+45	0.4481	0.67	Q	V		
11+50	0.4527	0.68	Q	V		
11+55	0.4575	0.69	Q	V		
12+ 0	0.4623	0.69	Q	V		
12+ 5	0.4671	0.70	Q	V		
12+10	0.4721	0.72	Q	V		
12+15	0.4771	0.73	Q	V		
12+20	0.4822	0.74	Q	V		
12+25	0.4874	0.75	Q	V		
12+30	0.4926	0.76	Q	V		
12+35	0.4978	0.76	Q	V		
12+40	0.5032	0.77	Q	V		
12+45	0.5086	0.78	Q	V		
12+50	0.5140	0.79	Q	V		
12+55	0.5196	0.80	Q	V		
13+ 0	0.5252	0.81	Q	V		
13+ 5	0.5308	0.82	Q	V		
13+10	0.5366	0.83	Q	V		
13+15	0.5424	0.85	Q	V		
13+20	0.5483	0.86	Q	V		
13+25	0.5543	0.87	Q	V		
13+30	0.5604	0.88	Q	V		
13+35	0.5666	0.90	Q	V		
13+40	0.5729	0.91	Q	V		
13+45	0.5792	0.93	Q	V		
13+50	0.5857	0.94	Q	V		
13+55	0.5924	0.96	Q	V		
14+ 0	0.5991	0.98	Q	V		
14+ 5	0.6060	1.00	Q	V		
14+10	0.6130	1.02	Q	V		
14+15	0.6201	1.04	Q	V		
14+20	0.6274	1.06	Q	V		
14+25	0.6349	1.09	Q	V		
14+30	0.6426	1.11	Q	V		
14+35	0.6504	1.14	Q	V		
14+40	0.6585	1.17	Q	V		

14+45	0.6668	1.20	Q	V		
14+50	0.6753	1.24	Q	V		
14+55	0.6841	1.28	Q	V		
15+ 0	0.6933	1.33	Q	V		
15+ 5	0.7027	1.37	Q	V		
15+10	0.7126	1.43	Q		V	
15+15	0.7228	1.49	Q		V	
15+20	0.7336	1.56	Q		V	
15+25	0.7445	1.59	Q		V	
15+30	0.7547	1.48	Q		V	
15+35	0.7650	1.49	Q		V	
15+40	0.7762	1.63	Q		V	
15+45	0.7887	1.81	Q		V	
15+50	0.8033	2.12	Q		V	
15+55	0.8210	2.57	Q		V	
16+ 0	0.8453	3.53	Q		V	
16+ 5	0.8881	6.21		Q	V	
16+10	0.9665	11.38			Q V	
16+15	1.0112	6.49		Q	V	
16+20	1.0299	2.71	Q		V	
16+25	1.0426	1.85	Q		V	
16+30	1.0541	1.67	Q		V	
16+35	1.0649	1.57	Q		V	
16+40	1.0748	1.44	Q			V
16+45	1.0840	1.34	Q			V
16+50	1.0926	1.25	Q			V
16+55	1.1007	1.18	Q			V
17+ 0	1.1084	1.12	Q			V
17+ 5	1.1158	1.07	Q			V
17+10	1.1228	1.02	Q			V
17+15	1.1296	0.98	Q			V
17+20	1.1361	0.95	Q			V
17+25	1.1424	0.92	Q			V
17+30	1.1485	0.89	Q			V
17+35	1.1544	0.86	Q			V
17+40	1.1602	0.84	Q			V
17+45	1.1658	0.81	Q			V
17+50	1.1713	0.79	Q			V
17+55	1.1766	0.78	Q			V
18+ 0	1.1818	0.76	Q			V
18+ 5	1.1869	0.74	Q			V
18+10	1.1919	0.72	Q			V
18+15	1.1967	0.70	Q			V
18+20	1.2014	0.68	Q			V
18+25	1.2060	0.67	Q			V
18+30	1.2105	0.66	Q			V
18+35	1.2149	0.65	Q			V
18+40	1.2193	0.64	Q			V
18+45	1.2236	0.62	Q			V
18+50	1.2279	0.61	Q			V
18+55	1.2320	0.61	Q			V
19+ 0	1.2361	0.60	Q			V
19+ 5	1.2402	0.59	Q			V
19+10	1.2442	0.58	Q			V
19+15	1.2481	0.57	Q			V
19+20	1.2520	0.56	Q			V
19+25	1.2558	0.56	Q			V
19+30	1.2596	0.55	Q			V
19+35	1.2634	0.54	Q			V

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  19+40       1.2671      0.54  |Q         |          |          |    V    |
  19+45       1.2707      0.53  |Q         |          |          |    V    |
  19+50       1.2743      0.52  |Q         |          |          |    V    |
  19+55       1.2779      0.52  |Q         |          |          |    V    |
  20+ 0       1.2814      0.51  |Q         |          |          |     V   |
  20+ 5       1.2849      0.51  |Q         |          |          |     V   |
  20+10       1.2884      0.50  |Q         |          |          |     V   |
  20+15       1.2918      0.50  Q          |          |          |     V   |
  20+20       1.2952      0.49  Q          |          |          |     V   |
  20+25       1.2985      0.49  Q          |          |          |     V   |
  20+30       1.3018      0.48  Q          |          |          |     V   |
  20+35       1.3051      0.48  Q          |          |          |     V   |
  20+40       1.3084      0.47  Q          |          |          |     V   |
  20+45       1.3116      0.47  Q          |          |          |     V   |
  20+50       1.3148      0.46  Q          |          |          |     V   |
  20+55       1.3180      0.46  Q          |          |          |      V  |
  21+ 0       1.3211      0.46  Q          |          |          |      V  |
  21+ 5       1.3243      0.45  Q          |          |          |      V  |
  21+10       1.3273      0.45  Q          |          |          |      V  |
  21+15       1.3304      0.45  Q          |          |          |      V  |
  21+20       1.3335      0.44  Q          |          |          |      V  |
  21+25       1.3365      0.44  Q          |          |          |      V  |
  21+30       1.3395      0.43  Q          |          |          |      V  |
  21+35       1.3424      0.43  Q          |          |          |      V  |
  21+40       1.3454      0.43  Q          |          |          |      V  |
  21+45       1.3483      0.42  Q          |          |          |      V  |
  21+50       1.3512      0.42  Q          |          |          |      V  |
  21+55       1.3541      0.42  Q          |          |          |       V |
  22+ 0       1.3570      0.42  Q          |          |          |       V |
  22+ 5       1.3598      0.41  Q          |          |          |       V |
  22+10       1.3626      0.41  Q          |          |          |       V |
  22+15       1.3654      0.41  Q          |          |          |       V |
  22+20       1.3682      0.40  Q          |          |          |       V |
  22+25       1.3710      0.40  Q          |          |          |       V |
  22+30       1.3737      0.40  Q          |          |          |       V |
  22+35       1.3764      0.40  Q          |          |          |       V |
  22+40       1.3792      0.39  Q          |          |          |       V |
  22+45       1.3818      0.39  Q          |          |          |       V |
  22+50       1.3845      0.39  Q          |          |          |       V |
  22+55       1.3872      0.39  Q          |          |          |       V |
  23+ 0       1.3898      0.38  Q          |          |          |        V|
  23+ 5       1.3925      0.38  Q          |          |          |        V|
  23+10       1.3951      0.38  Q          |          |          |        V|
  23+15       1.3977      0.38  Q          |          |          |        V|
  23+20       1.4002      0.37  Q          |          |          |        V|
  23+25       1.4028      0.37  Q          |          |          |        V|
  23+30       1.4054      0.37  Q          |          |          |        V|
  23+35       1.4079      0.37  Q          |          |          |        V|
  23+40       1.4104      0.37  Q          |          |          |        V|
  23+45       1.4129      0.36  Q          |          |          |        V|
  23+50       1.4154      0.36  Q          |          |          |        V|
  23+55       1.4179      0.36  Q          |          |          |        V|
  24+ 0       1.4204      0.36  Q          |          |          |        V|
  24+ 5       1.4225      0.31  Q          |          |          |        V|
  24+10       1.4233      0.11  Q          |          |          |        V|
  24+15       1.4234      0.01  Q          |          |          |        V|
  24+20       1.4234      0.00  Q          |          |          |         V
----------------------------------------------------------------------
```

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 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA B5
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
1.86	1	1.20
Rainfall data for year 100		
1.86	6	3.00
Rainfall data for year 100		
1.86	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	1.86	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.19	0.100	56.0	56.0	7.86	0.266
1.67	0.900	98.0	98.0	0.20	0.960

Area-averaged catchment yield fraction, Y = 0.891
Area-averaged low loss fraction, Yb = 0.109
User entry of time of concentration = 0.093 (hours)
++
Watershed area = 1.86(Ac.)
Catchment Lag time = 0.074 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 112.0072
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 1.86(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000	Adjusted rainfall = 0.444(In)
30-minute factor = 1.000	Adjusted rainfall = 0.909(In)
1-hour factor = 1.000	Adjusted rainfall = 1.200(In)
3-hour factor = 1.000	Adjusted rainfall = 2.105(In)
6-hour factor = 1.000	Adjusted rainfall = 3.000(In)
24-hour factor = 1.000	Adjusted rainfall = 6.000(In)

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

+++

(K = 22.49 (CFS))

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
1	21.220	4.773
2	85.584	14.478
3	98.795	2.972
4	100.000	0.271

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4441	0.4441
2	0.5860	0.1419
3	0.6892	0.1032
4	0.7732	0.0840
5	0.8454	0.0722
6	0.9094	0.0640

7	0.9672	0.0578
8	1.0203	0.0531
9	1.0695	0.0492
10	1.1155	0.0460
11	1.1589	0.0433
12	1.1999	0.0410
13	1.2500	0.0501
14	1.2983	0.0483
15	1.3450	0.0466
16	1.3901	0.0451
17	1.4339	0.0438
18	1.4764	0.0425
19	1.5178	0.0414
20	1.5582	0.0403
21	1.5975	0.0394
22	1.6360	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8508	0.0341
29	1.8843	0.0335
30	1.9172	0.0330
31	1.9497	0.0324
32	1.9816	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1926	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3321	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5150	0.0253
52	2.5401	0.0251
53	2.5649	0.0249
54	2.5896	0.0246
55	2.6140	0.0244
56	2.6382	0.0242
57	2.6622	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8020	0.0228
64	2.8246	0.0227
65	2.8471	0.0225

66	2.8694	0.0223
67	2.8916	0.0222
68	2.9136	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0414	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1623	0.0198
81	3.1820	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2404	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5882	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8406	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161
122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159

125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0774	0.0154
134	4.0927	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2131	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3157	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4159	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5139	0.0139
164	4.5277	0.0138
165	4.5415	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5826	0.0137
169	4.5962	0.0136
170	4.6098	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6503	0.0135
174	4.6637	0.0134
175	4.6771	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7566	0.0132
182	4.7697	0.0131
183	4.7828	0.0131

184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8348	0.0129
188	4.8477	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8990	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1235	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2082	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2797	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3151	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4199	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114

243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5453	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5902	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7009	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7337	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8095	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8737	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9372	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9687	0.0105
286	5.9791	0.0105
287	5.9896	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095

9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115

68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157

127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0403	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366

186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0640	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4441	0.0061	0.4380
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0321
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127

245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =       0.59(In)
Total effective rainfall =       5.41(In)
Peak flow rate in flood hydrograph =       7.14(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
                 R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
```

0+ 5	0.0003	0.04	Q
0+10	0.0015	0.18	Q
0+15	0.0030	0.21	Q
0+20	0.0044	0.21	Q
0+25	0.0059	0.21	Q
0+30	0.0073	0.21	Q
0+35	0.0088	0.21	Q
0+40	0.0102	0.21	Q
0+45	0.0117	0.21	Q
0+50	0.0132	0.21	Q
0+55	0.0146	0.21	Q
1+ 0	0.0161	0.21	Q
1+ 5	0.0176	0.22	Q
1+10	0.0191	0.22	Q
1+15	0.0206	0.22	Q
1+20	0.0221	0.22	QV
1+25	0.0236	0.22	QV
1+30	0.0251	0.22	QV
1+35	0.0266	0.22	QV
1+40	0.0281	0.22	QV
1+45	0.0296	0.22	QV
1+50	0.0311	0.22	QV
1+55	0.0326	0.22	QV
2+ 0	0.0342	0.22	QV
2+ 5	0.0357	0.22	QV
2+10	0.0372	0.22	QV
2+15	0.0388	0.22	QV
2+20	0.0403	0.22	QV
2+25	0.0419	0.23	QV
2+30	0.0434	0.23	Q V
2+35	0.0450	0.23	Q V
2+40	0.0466	0.23	Q V
2+45	0.0481	0.23	Q V
2+50	0.0497	0.23	Q V
2+55	0.0513	0.23	Q V
3+ 0	0.0529	0.23	Q V
3+ 5	0.0545	0.23	Q V
3+10	0.0561	0.23	Q V
3+15	0.0577	0.23	Q V
3+20	0.0593	0.23	Q V
3+25	0.0609	0.23	Q V
3+30	0.0625	0.23	Q V
3+35	0.0641	0.24	Q V
3+40	0.0658	0.24	Q V
3+45	0.0674	0.24	Q V
3+50	0.0690	0.24	Q V
3+55	0.0707	0.24	Q V
4+ 0	0.0723	0.24	Q V
4+ 5	0.0740	0.24	Q V
4+10	0.0756	0.24	Q V
4+15	0.0773	0.24	Q V
4+20	0.0790	0.24	Q V
4+25	0.0807	0.24	Q V
4+30	0.0823	0.24	Q V
4+35	0.0840	0.25	Q V
4+40	0.0857	0.25	Q V
4+45	0.0874	0.25	Q V
4+50	0.0891	0.25	Q V
4+55	0.0909	0.25	Q V

5+ 0	0.0926	0.25	Q V				
5+ 5	0.0943	0.25	Q V				
5+10	0.0961	0.25	Q V				
5+15	0.0978	0.25	Q V				
5+20	0.0995	0.25	Q V				
5+25	0.1013	0.25	Q V				
5+30	0.1031	0.26	Q V				
5+35	0.1048	0.26	Q V				
5+40	0.1066	0.26	Q V				
5+45	0.1084	0.26	Q V				
5+50	0.1102	0.26	Q V				
5+55	0.1120	0.26	Q V				
6+ 0	0.1138	0.26	Q V				
6+ 5	0.1156	0.26	Q V				
6+10	0.1174	0.26	Q V				
6+15	0.1192	0.27	Q V				
6+20	0.1211	0.27	Q V				
6+25	0.1229	0.27	Q V				
6+30	0.1248	0.27	Q V				
6+35	0.1266	0.27	Q V				
6+40	0.1285	0.27	Q V				
6+45	0.1304	0.27	Q V				
6+50	0.1323	0.27	Q V				
6+55	0.1342	0.27	Q V				
7+ 0	0.1361	0.28	Q V				
7+ 5	0.1380	0.28	Q V				
7+10	0.1399	0.28	Q V				
7+15	0.1418	0.28	Q V				
7+20	0.1437	0.28	Q V				
7+25	0.1457	0.28	Q V				
7+30	0.1477	0.28	Q V				
7+35	0.1496	0.29	Q V				
7+40	0.1516	0.29	Q V				
7+45	0.1536	0.29	Q V				
7+50	0.1556	0.29	Q V				
7+55	0.1576	0.29	Q V				
8+ 0	0.1596	0.29	Q V				
8+ 5	0.1616	0.29	Q V				
8+10	0.1636	0.30	Q V				
8+15	0.1657	0.30	Q V				
8+20	0.1678	0.30	Q V				
8+25	0.1698	0.30	Q V				
8+30	0.1719	0.30	Q V				
8+35	0.1740	0.30	Q V				
8+40	0.1761	0.31	Q V				
8+45	0.1782	0.31	Q V				
8+50	0.1803	0.31	Q V				
8+55	0.1825	0.31	Q V				
9+ 0	0.1846	0.31	Q V				
9+ 5	0.1868	0.31	Q V				
9+10	0.1890	0.32	Q V				
9+15	0.1912	0.32	Q V				
9+20	0.1934	0.32	Q V				
9+25	0.1956	0.32	Q V				
9+30	0.1978	0.32	Q V				
9+35	0.2000	0.33	Q V				
9+40	0.2023	0.33	Q V				
9+45	0.2046	0.33	Q V				
9+50	0.2069	0.33	Q V				

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  9+55       0.2092      0.33  |Q       V|         |         |         |
 10+ 0       0.2115      0.34  |Q        V         |         |         |
 10+ 5       0.2138      0.34  |Q        V         |         |         |
 10+10       0.2162      0.34  |Q        V         |         |         |
 10+15       0.2185      0.34  |Q        V         |         |         |
 10+20       0.2209      0.35  |Q        V         |         |         |
 10+25       0.2233      0.35  |Q        V         |         |         |
 10+30       0.2258      0.35  |Q        V         |         |         |
 10+35       0.2282      0.35  |Q        V         |         |         |
 10+40       0.2306      0.36  |Q        |V        |         |         |
 10+45       0.2331      0.36  |Q        |V        |         |         |
 10+50       0.2356      0.36  |Q        |V        |         |         |
 10+55       0.2381      0.36  |Q        |V        |         |         |
 11+ 0       0.2407      0.37  |Q        |V        |         |         |
 11+ 5       0.2432      0.37  |Q        |V        |         |         |
 11+10       0.2458      0.37  |Q        |V        |         |         |
 11+15       0.2484      0.38  |Q        |V        |         |         |
 11+20       0.2510      0.38  |Q        |V        |         |         |
 11+25       0.2537      0.38  |Q        | V       |         |         |
 11+30       0.2563      0.39  |Q        | V       |         |         |
 11+35       0.2590      0.39  |Q        | V       |         |         |
 11+40       0.2617      0.39  |Q        | V       |         |         |
 11+45       0.2645      0.40  |Q        | V       |         |         |
 11+50       0.2672      0.40  |Q        | V       |         |         |
 11+55       0.2700      0.41  |Q        | V       |         |         |
 12+ 0       0.2729      0.41  |Q        |  V      |         |         |
 12+ 5       0.2757      0.42  |Q        |  V      |         |         |
 12+10       0.2787      0.43  |Q        |  V      |         |         |
 12+15       0.2816      0.43  |Q        |  V      |         |         |
 12+20       0.2847      0.44  |Q        |  V      |         |         |
 12+25       0.2877      0.44  |Q        |  V      |         |         |
 12+30       0.2908      0.45  |Q        |  V      |         |         |
 12+35       0.2939      0.45  |Q        |   V     |         |         |
 12+40       0.2970      0.46  |Q        |   V     |         |         |
 12+45       0.3002      0.46  |Q        |   V     |         |         |
 12+50       0.3034      0.47  |Q        |   V     |         |         |
 12+55       0.3067      0.47  |Q        |   V     |         |         |
 13+ 0       0.3100      0.48  |Q        |   V     |         |         |
 13+ 5       0.3134      0.49  |Q        |   V     |         |         |
 13+10       0.3168      0.49  |Q        |    V    |         |         |
 13+15       0.3202      0.50  |Q        |    V    |         |         |
 13+20       0.3237      0.51  | Q       |    V    |         |         |
 13+25       0.3272      0.51  | Q       |    V    |         |         |
 13+30       0.3308      0.52  | Q       |    V    |         |         |
 13+35       0.3345      0.53  | Q       |    V    |         |         |
 13+40       0.3382      0.54  | Q       |     V   |         |         |
 13+45       0.3420      0.55  | Q       |     V   |         |         |
 13+50       0.3458      0.56  | Q       |     V   |         |         |
 13+55       0.3497      0.57  | Q       |     V   |         |         |
 14+ 0       0.3537      0.58  | Q       |     V   |         |         |
 14+ 5       0.3578      0.59  | Q       |      V  |         |         |
 14+10       0.3619      0.60  | Q       |      V  |         |         |
 14+15       0.3662      0.61  | Q       |      V  |         |         |
 14+20       0.3705      0.63  | Q       |      V  |         |         |
 14+25       0.3749      0.64  | Q       |      V  |         |         |
 14+30       0.3795      0.66  | Q       |       V |         |         |
 14+35       0.3841      0.67  | Q       |       V |         |         |
 14+40       0.3889      0.70  | Q       |       V |         |         |
 14+45       0.3938      0.71  | Q       |       V |         |         |
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14+50       0.3989      0.74  | Q       |        V|         |         |
14+55       0.4041      0.76  |  Q      |        V|         |         |
15+ 0       0.4095      0.79  |  Q      |        V|         |         |
15+ 5       0.4152      0.81  |  Q      |        V|         |         |
15+10       0.4210      0.85  |  Q      |         V         |         |
15+15       0.4271      0.89  |  Q      |         V         |         |
15+20       0.4335      0.93  |  Q      |         V         |         |
15+25       0.4400      0.93  |  Q      |         |V        |         |
15+30       0.4458      0.85  |  Q      |         |V        |         |
15+35       0.4520      0.89  |  Q      |         |V        |         |
15+40       0.4587      0.99  |  Q      |         |V        |         |
15+45       0.4663      1.10  |   Q     |         | V       |         |
15+50       0.4753      1.31  |    Q    |         | V       |         |
15+55       0.4864      1.60  |     Q   |         |  V      |         |
16+ 0       0.5020      2.27  |        Q|         |  V      |         |
16+ 5       0.5320      4.36  |         |      Q  |    V    |         |
16+10       0.5812      7.14  |         |         |      VQ |         |
16+15       0.5999      2.71  |         Q         |       V |         |
16+20       0.6088      1.29  |    Q    |         |        V|         |
16+25       0.6156      0.98  |  Q      |         |        V|         |
16+30       0.6223      0.97  |  Q      |         |        V|         |
16+35       0.6285      0.90  |  Q      |         |         V         |
16+40       0.6342      0.83  |  Q      |         |         V         |
16+45       0.6395      0.77  |  Q      |         |         V         |
16+50       0.6445      0.72  | Q       |         |         V         |
16+55       0.6492      0.68  | Q       |         |         V         |
17+ 0       0.6537      0.65  | Q       |         |         |V        |
17+ 5       0.6579      0.62  | Q       |         |         |V        |
17+10       0.6620      0.59  | Q       |         |         |V        |
17+15       0.6660      0.57  | Q       |         |         |V        |
17+20       0.6698      0.55  | Q       |         |         |V        |
17+25       0.6734      0.53  | Q       |         |         | V       |
17+30       0.6770      0.52  | Q       |         |         | V       |
17+35       0.6805      0.50  | Q       |         |         | V       |
17+40       0.6838      0.49  |Q        |         |         | V       |
17+45       0.6871      0.48  |Q        |         |         | V       |
17+50       0.6903      0.46  |Q        |         |         | V       |
17+55       0.6934      0.45  |Q        |         |         |  V      |
18+ 0       0.6965      0.44  |Q        |         |         |  V      |
18+ 5       0.6995      0.43  |Q        |         |         |  V      |
18+10       0.7023      0.42  |Q        |         |         |  V      |
18+15       0.7051      0.41  |Q        |         |         |  V      |
18+20       0.7079      0.40  |Q        |         |         |  V      |
18+25       0.7106      0.39  |Q        |         |         |  V      |
18+30       0.7132      0.39  |Q        |         |         |   V     |
18+35       0.7158      0.38  |Q        |         |         |   V     |
18+40       0.7184      0.37  |Q        |         |         |   V     |
18+45       0.7209      0.37  |Q        |         |         |   V     |
18+50       0.7234      0.36  |Q        |         |         |   V     |
18+55       0.7259      0.35  |Q        |         |         |   V     |
19+ 0       0.7283      0.35  |Q        |         |         |   V     |
19+ 5       0.7306      0.34  |Q        |         |         |   V     |
19+10       0.7330      0.34  |Q        |         |         |   V     |
19+15       0.7353      0.34  |Q        |         |         |    V    |
19+20       0.7376      0.33  |Q        |         |         |    V    |
19+25       0.7398      0.33  |Q        |         |         |    V    |
19+30       0.7420      0.32  |Q        |         |         |    V    |
19+35       0.7442      0.32  |Q        |         |         |    V    |
19+40       0.7464      0.31  |Q        |         |         |    V    |
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  19+45       0.7485      0.31  |Q         |         |         |   V     |
  19+50       0.7507      0.31  |Q         |         |         |   V     |
  19+55       0.7528      0.30  |Q         |         |         |   V     |
  20+ 0       0.7548      0.30  |Q         |         |         |    V    |
  20+ 5       0.7569      0.30  |Q         |         |         |    V    |
  20+10       0.7589      0.29  |Q         |         |         |    V    |
  20+15       0.7609      0.29  |Q         |         |         |    V    |
  20+20       0.7629      0.29  |Q         |         |         |    V    |
  20+25       0.7649      0.29  |Q         |         |         |    V    |
  20+30       0.7668      0.28  |Q         |         |         |    V    |
  20+35       0.7687      0.28  |Q         |         |         |    V    |
  20+40       0.7707      0.28  |Q         |         |         |    V    |
  20+45       0.7726      0.28  |Q         |         |         |    V    |
  20+50       0.7744      0.27  |Q         |         |         |    V    |
  20+55       0.7763      0.27  |Q         |         |         |     V   |
  21+ 0       0.7781      0.27  |Q         |         |         |     V   |
  21+ 5       0.7800      0.27  |Q         |         |         |     V   |
  21+10       0.7818      0.26  |Q         |         |         |     V   |
  21+15       0.7836      0.26  |Q         |         |         |     V   |
  21+20       0.7854      0.26  |Q         |         |         |     V   |
  21+25       0.7871      0.26  |Q         |         |         |     V   |
  21+30       0.7889      0.26  |Q         |         |         |     V   |
  21+35       0.7906      0.25  |Q         |         |         |     V   |
  21+40       0.7924      0.25  |Q         |         |         |     V   |
  21+45       0.7941      0.25  Q          |         |         |     V   |
  21+50       0.7958      0.25  Q          |         |         |     V   |
  21+55       0.7975      0.25  Q          |         |         |      V  |
  22+ 0       0.7992      0.24  Q          |         |         |      V  |
  22+ 5       0.8008      0.24  Q          |         |         |      V  |
  22+10       0.8025      0.24  Q          |         |         |      V  |
  22+15       0.8041      0.24  Q          |         |         |      V  |
  22+20       0.8058      0.24  Q          |         |         |      V  |
  22+25       0.8074      0.24  Q          |         |         |      V  |
  22+30       0.8090      0.23  Q          |         |         |      V  |
  22+35       0.8106      0.23  Q          |         |         |      V  |
  22+40       0.8122      0.23  Q          |         |         |      V  |
  22+45       0.8138      0.23  Q          |         |         |      V  |
  22+50       0.8154      0.23  Q          |         |         |      V  |
  22+55       0.8169      0.23  Q          |         |         |        V|
  23+ 0       0.8185      0.23  Q          |         |         |        V|
  23+ 5       0.8200      0.22  Q          |         |         |        V|
  23+10       0.8216      0.22  Q          |         |         |        V|
  23+15       0.8231      0.22  Q          |         |         |        V|
  23+20       0.8246      0.22  Q          |         |         |        V|
  23+25       0.8261      0.22  Q          |         |         |        V|
  23+30       0.8276      0.22  Q          |         |         |        V|
  23+35       0.8291      0.22  Q          |         |         |        V|
  23+40       0.8306      0.22  Q          |         |         |        V|
  23+45       0.8321      0.21  Q          |         |         |        V|
  23+50       0.8335      0.21  Q          |         |         |        V|
  23+55       0.8350      0.21  Q          |         |         |        V|
  24+ 0       0.8364      0.21  Q          |         |         |        V|
  24+ 5       0.8376      0.17  Q          |         |         |        V|
  24+10       0.8378      0.03  Q          |         |         |        V|
  24+15       0.8378      0.00  Q          |         |         |        V|
-----------------------------------------------------------------------
```

APPENDIX C.4: UNIT HYDROGRAPH ANALYSIS, AREAS "C"

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

Study date 03/13/23

++

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA C1
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
4.98	1	1.20
Rainfall data for year 100		
4.98	6	3.00
Rainfall data for year 100		
4.98	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	4.98	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.50   0.100          56.0      56.0       7.86     0.266
     4.48   0.900          98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.140 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       4.98(Ac.)
Catchment Lag time =   0.112 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 74.4048
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       4.98(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph         Unit Hydrograph
Number            Mean values           ((CFS))
---------------------------------------------------------------------
            (K =        60.23 (CFS))

  1                9.857                 5.937
  2               58.164                29.094
  3               91.715                20.207
  4               98.412                 4.033
  5              100.000                 0.956
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number             (In)                 (In)
  1             0.4440               0.4440
  2             0.5859               0.1419
  3             0.6891               0.1032
  4             0.7731               0.0840
  5             0.8453               0.0722
```

6	0.9092	0.0639
7	0.9670	0.0578
8	1.0201	0.0531
9	1.0693	0.0492
10	1.1153	0.0460
11	1.1587	0.0433
12	1.1997	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3448	0.0466
16	1.3899	0.0451
17	1.4337	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5580	0.0404
21	1.5974	0.0394
22	1.6359	0.0385
23	1.6735	0.0376
24	1.7103	0.0368
25	1.7464	0.0361
26	1.7818	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0129	0.0314
34	2.0439	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3856	0.0267
47	2.4120	0.0264
48	2.4381	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6139	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230
63	2.8019	0.0228
64	2.8246	0.0227

65	2.8471	0.0225
66	2.8694	0.0223
67	2.8915	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9570	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3726	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4820	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6571	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8078	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8729	0.0162
121	3.8890	0.0161
122	3.9051	0.0160
123	3.9210	0.0160

124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0155	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2278	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3874	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4860	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5276	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5961	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6636	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7169	0.0133
179	4.7302	0.0132
180	4.7434	0.0132
181	4.7565	0.0132
182	4.7697	0.0131

183	4.7827	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9874	0.0125
200	5.0000	0.0125
201	5.0124	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4313	0.0115
237	5.4428	0.0115
238	5.4543	0.0115
239	5.4658	0.0114
240	5.4772	0.0114
241	5.4886	0.0114

242	5.5000	0.0114
243	5.5113	0.0114
244	5.5226	0.0113
245	5.5339	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5789	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6124	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7662	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9160	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9581	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094
6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094

8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113
65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114

67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154
124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156

126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0404	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390
183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430

185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0639	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0970
192	0.1419	0.0061	0.1358
193	0.4440	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131
242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128

244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
-------------------------------------------------------------------
-------------------------------------------------------------------
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =     16.40(CFS)
--------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

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

```
------------------------------------------------------------------------
  0+ 5        0.0004      0.06  Q         |         |         |         |
  0+10        0.0026      0.33  Q         |         |         |         |
  0+15        0.0062      0.51  VQ        |         |         |         |
  0+20        0.0100      0.55  VQ        |         |         |         |
  0+25        0.0138      0.56  VQ        |         |         |         |
  0+30        0.0177      0.56  VQ        |         |         |         |
  0+35        0.0216      0.57  VQ        |         |         |         |
  0+40        0.0255      0.57  VQ        |         |         |         |
  0+45        0.0295      0.57  VQ        |         |         |         |
  0+50        0.0334      0.57  VQ        |         |         |         |
  0+55        0.0373      0.57  VQ        |         |         |         |
  1+ 0        0.0413      0.57  VQ        |         |         |         |
  1+ 5        0.0452      0.58  VQ        |         |         |         |
  1+10        0.0492      0.58  VQ        |         |         |         |
  1+15        0.0532      0.58  VQ        |         |         |         |
  1+20        0.0572      0.58  |Q        |         |         |         |
  1+25        0.0612      0.58  |Q        |         |         |         |
  1+30        0.0652      0.58  |Q        |         |         |         |
  1+35        0.0692      0.58  |Q        |         |         |         |
  1+40        0.0733      0.59  |Q        |         |         |         |
  1+45        0.0773      0.59  |Q        |         |         |         |
  1+50        0.0814      0.59  |Q        |         |         |         |
  1+55        0.0855      0.59  |Q        |         |         |         |
  2+ 0        0.0896      0.59  |Q        |         |         |         |
  2+ 5        0.0937      0.60  |Q        |         |         |         |
  2+10        0.0978      0.60  |Q        |         |         |         |
  2+15        0.1019      0.60  |Q        |         |         |         |
  2+20        0.1060      0.60  |Q        |         |         |         |
  2+25        0.1102      0.60  |Q        |         |         |         |
  2+30        0.1143      0.60  |QV       |         |         |         |
  2+35        0.1185      0.61  |QV       |         |         |         |
  2+40        0.1227      0.61  |QV       |         |         |         |
  2+45        0.1269      0.61  |QV       |         |         |         |
  2+50        0.1311      0.61  |QV       |         |         |         |
  2+55        0.1353      0.61  |QV       |         |         |         |
  3+ 0        0.1396      0.62  |QV       |         |         |         |
  3+ 5        0.1438      0.62  |QV       |         |         |         |
  3+10        0.1481      0.62  |QV       |         |         |         |
  3+15        0.1524      0.62  |QV       |         |         |         |
  3+20        0.1567      0.62  |QV       |         |         |         |
  3+25        0.1610      0.63  |QV       |         |         |         |
  3+30        0.1653      0.63  |QV       |         |         |         |
  3+35        0.1697      0.63  |Q V      |         |         |         |
  3+40        0.1740      0.63  |Q V      |         |         |         |
  3+45        0.1784      0.63  |Q V      |         |         |         |
  3+50        0.1827      0.64  |Q V      |         |         |         |
  3+55        0.1871      0.64  |Q V      |         |         |         |
  4+ 0        0.1916      0.64  |Q V      |         |         |         |
  4+ 5        0.1960      0.64  |Q V      |         |         |         |
  4+10        0.2004      0.64  |Q V      |         |         |         |
  4+15        0.2049      0.65  |Q V      |         |         |         |
  4+20        0.2094      0.65  |Q V      |         |         |         |
  4+25        0.2138      0.65  |Q V      |         |         |         |
  4+30        0.2183      0.65  |Q V      |         |         |         |
  4+35        0.2229      0.66  |Q V      |         |         |         |
  4+40        0.2274      0.66  |Q  V     |         |         |         |
  4+45        0.2320      0.66  |Q  V     |         |         |         |
  4+50        0.2365      0.66  |Q  V     |         |         |         |
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4+55	0.2411	0.67	Q V			
5+ 0	0.2457	0.67	Q V			
5+ 5	0.2503	0.67	Q V			
5+10	0.2550	0.67	Q V			
5+15	0.2596	0.68	Q V			
5+20	0.2643	0.68	Q V			
5+25	0.2690	0.68	Q V			
5+30	0.2737	0.68	Q V			
5+35	0.2784	0.69	Q V			
5+40	0.2832	0.69	Q V			
5+45	0.2879	0.69	Q V			
5+50	0.2927	0.69	Q V			
5+55	0.2975	0.70	Q V			
6+ 0	0.3024	0.70	Q V			
6+ 5	0.3072	0.70	Q V			
6+10	0.3121	0.71	Q V			
6+15	0.3169	0.71	Q V			
6+20	0.3219	0.71	Q V			
6+25	0.3268	0.72	Q V			
6+30	0.3317	0.72	Q V			
6+35	0.3367	0.72	Q V			
6+40	0.3417	0.72	Q V			
6+45	0.3467	0.73	Q V			
6+50	0.3517	0.73	Q V			
6+55	0.3568	0.73	Q V			
7+ 0	0.3619	0.74	Q V			
7+ 5	0.3670	0.74	Q V			
7+10	0.3721	0.74	Q V			
7+15	0.3772	0.75	Q V			
7+20	0.3824	0.75	Q V			
7+25	0.3876	0.75	Q V			
7+30	0.3928	0.76	Q V			
7+35	0.3981	0.76	Q V			
7+40	0.4034	0.77	Q V			
7+45	0.4087	0.77	Q V			
7+50	0.4140	0.77	Q V			
7+55	0.4193	0.78	Q V			
8+ 0	0.4247	0.78	Q V			
8+ 5	0.4301	0.79	Q V			
8+10	0.4356	0.79	Q V			
8+15	0.4410	0.79	Q V			
8+20	0.4465	0.80	Q V			
8+25	0.4521	0.80	Q V			
8+30	0.4576	0.81	Q V			
8+35	0.4632	0.81	Q V			
8+40	0.4688	0.82	Q V			
8+45	0.4745	0.82	Q V			
8+50	0.4801	0.82	Q V			
8+55	0.4858	0.83	Q V			
9+ 0	0.4916	0.83	Q V			
9+ 5	0.4974	0.84	Q V			
9+10	0.5032	0.84	Q V			
9+15	0.5090	0.85	Q V			
9+20	0.5149	0.85	Q V			
9+25	0.5208	0.86	Q V			
9+30	0.5268	0.86	Q V			
9+35	0.5328	0.87	Q V			
9+40	0.5388	0.88	Q V			
9+45	0.5449	0.88	Q V			

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 9+50       0.5510      0.89  |Q       V|         |         |         |
 9+55       0.5571      0.89  |Q       V|         |         |         |
10+ 0       0.5633      0.90  |Q        V         |         |         |
10+ 5       0.5695      0.90  |Q        V         |         |         |
10+10       0.5758      0.91  |Q        V         |         |         |
10+15       0.5821      0.92  |Q        V         |         |         |
10+20       0.5885      0.92  |Q        V         |         |         |
10+25       0.5949      0.93  |Q        V         |         |         |
10+30       0.6014      0.94  |Q        V         |         |         |
10+35       0.6079      0.94  |Q        V         |         |         |
10+40       0.6144      0.95  |Q        V         |         |         |
10+45       0.6210      0.96  |Q        |V        |         |         |
10+50       0.6277      0.97  |Q        |V        |         |         |
10+55       0.6344      0.97  |Q        |V        |         |         |
11+ 0       0.6411      0.98  |Q        |V        |         |         |
11+ 5       0.6480      0.99  |Q        |V        |         |         |
11+10       0.6548      1.00  |Q        |V        |         |         |
11+15       0.6618      1.01  | Q       |V        |         |         |
11+20       0.6688      1.01  | Q       |V        |         |         |
11+25       0.6758      1.02  | Q       | V       |         |         |
11+30       0.6829      1.03  | Q       | V       |         |         |
11+35       0.6901      1.04  | Q       | V       |         |         |
11+40       0.6973      1.05  | Q       | V       |         |         |
11+45       0.7046      1.06  | Q       | V       |         |         |
11+50       0.7120      1.07  | Q       | V       |         |         |
11+55       0.7195      1.08  | Q       | V       |         |         |
12+ 0       0.7270      1.09  | Q       | V       |         |         |
12+ 5       0.7346      1.11  | Q       |  V      |         |         |
12+10       0.7424      1.13  | Q       |  V      |         |         |
12+15       0.7503      1.15  | Q       |  V      |         |         |
12+20       0.7583      1.16  | Q       |  V      |         |         |
12+25       0.7664      1.18  | Q       |  V      |         |         |
12+30       0.7746      1.19  | Q       |  V      |         |         |
12+35       0.7829      1.20  | Q       |  V      |         |         |
12+40       0.7913      1.22  | Q       |   V     |         |         |
12+45       0.7998      1.23  | Q       |   V     |         |         |
12+50       0.8084      1.25  | Q       |   V     |         |         |
12+55       0.8171      1.26  | Q       |   V     |         |         |
13+ 0       0.8259      1.28  | Q       |   V     |         |         |
13+ 5       0.8348      1.29  | Q       |   V     |         |         |
13+10       0.8438      1.31  | Q       |    V    |         |         |
13+15       0.8530      1.33  | Q       |    V    |         |         |
13+20       0.8622      1.35  | Q       |    V    |         |         |
13+25       0.8717      1.37  | Q       |    V    |         |         |
13+30       0.8812      1.39  | Q       |    V    |         |         |
13+35       0.8909      1.41  | Q       |    V    |         |         |
13+40       0.9008      1.43  | Q       |     V   |         |         |
13+45       0.9108      1.46  | Q       |     V   |         |         |
13+50       0.9211      1.48  | Q       |     V   |         |         |
13+55       0.9314      1.51  |  Q      |     V   |         |         |
14+ 0       0.9420      1.54  |  Q      |     V   |         |         |
14+ 5       0.9528      1.56  |  Q      |     V   |         |         |
14+10       0.9638      1.60  |  Q      |      V  |         |         |
14+15       0.9750      1.63  |  Q      |      V  |         |         |
14+20       0.9865      1.67  |  Q      |      V  |         |         |
14+25       0.9982      1.70  |  Q      |      V  |         |         |
14+30       1.0103      1.75  |  Q      |       V |         |         |
14+35       1.0226      1.79  |  Q      |       V |         |         |
14+40       1.0352      1.84  |  Q      |       V |         |         |
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14+45        1.0482       1.89  |  Q      |       V |         |         |
14+50        1.0616       1.94  |  Q      |       V |         |         |
14+55        1.0754       2.00  |   Q     |        V|         |         |
15+ 0        1.0897       2.07  |   Q     |        V|         |         |
15+ 5        1.1045       2.15  |   Q     |        V|         |         |
15+10        1.1198       2.23  |   Q     |        V|         |         |
15+15        1.1359       2.33  |   Q     |         V         |         |
15+20        1.1527       2.44  |   Q     |         V         |         |
15+25        1.1699       2.50  |    Q    |         V         |         |
15+30        1.1862       2.37  |   Q     |         |V        |         |
15+35        1.2023       2.34  |   Q     |         |V        |         |
15+40        1.2197       2.52  |    Q    |         |V        |         |
15+45        1.2389       2.80  |    Q    |         | V       |         |
15+50        1.2613       3.24  |     Q   |         | V       |         |
15+55        1.2881       3.90  |      Q  |         | V       |         |
16+ 0        1.3242       5.24  |         Q         |  V      |         |
16+ 5        1.3850       8.83  |         |      Q  |   V     |         |
16+10        1.4980      16.40  |         |         |     V   | Q       |
16+15        1.5811      12.06  |         |         |   Q   V |         |
16+20        1.6170       5.22  |         Q         |       V |         |
16+25        1.6393       3.24  |     Q   |         |        V|         |
16+30        1.6576       2.65  |    Q    |         |        V|         |
16+35        1.6748       2.51  |    Q    |         |        V|         |
16+40        1.6907       2.31  |   Q     |         |         V         |
16+45        1.7054       2.14  |   Q     |         |         V         |
16+50        1.7192       2.00  |  Q      |         |         V         |
16+55        1.7321       1.88  |  Q      |         |         V         |
17+ 0        1.7444       1.78  |  Q      |         |         |V        |
17+ 5        1.7561       1.70  |  Q      |         |         |V        |
17+10        1.7673       1.62  |  Q      |         |         |V        |
17+15        1.7780       1.56  |  Q      |         |         |V        |
17+20        1.7884       1.50  |  Q      |         |         |V        |
17+25        1.7984       1.45  | Q       |         |         | V       |
17+30        1.8081       1.41  | Q       |         |         | V       |
17+35        1.8174       1.36  | Q       |         |         | V       |
17+40        1.8266       1.33  | Q       |         |         | V       |
17+45        1.8355       1.29  | Q       |         |         | V       |
17+50        1.8441       1.26  | Q       |         |         | V       |
17+55        1.8526       1.23  | Q       |         |         |  V      |
18+ 0        1.8609       1.20  | Q       |         |         |  V      |
18+ 5        1.8689       1.17  | Q       |         |         |  V      |
18+10        1.8767       1.13  | Q       |         |         |  V      |
18+15        1.8843       1.10  | Q       |         |         |  V      |
18+20        1.8918       1.08  | Q       |         |         |  V      |
18+25        1.8991       1.06  | Q       |         |         |  V      |
18+30        1.9062       1.04  | Q       |         |         |  V      |
18+35        1.9133       1.02  | Q       |         |         |   V     |
18+40        1.9202       1.00  | Q       |         |         |   V     |
18+45        1.9270       0.99  |Q        |         |         |   V     |
18+50        1.9337       0.97  |Q        |         |         |   V     |
18+55        1.9403       0.96  |Q        |         |         |   V     |
19+ 0        1.9468       0.94  |Q        |         |         |   V     |
19+ 5        1.9532       0.93  |Q        |         |         |   V     |
19+10        1.9595       0.92  |Q        |         |         |   V     |
19+15        1.9657       0.90  |Q        |         |         |    V    |
19+20        1.9719       0.89  |Q        |         |         |    V    |
19+25        1.9779       0.88  |Q        |         |         |    V    |
19+30        1.9839       0.87  |Q        |         |         |    V    |
19+35        1.9898       0.86  |Q        |         |         |    V    |
```

19+40	1.9956	0.85	Q			V
19+45	2.0014	0.84	Q			V
19+50	2.0071	0.83	Q			V
19+55	2.0128	0.82	Q			V
20+ 0	2.0183	0.81	Q			V
20+ 5	2.0238	0.80	Q			V
20+10	2.0293	0.79	Q			V
20+15	2.0347	0.78	Q			V
20+20	2.0401	0.78	Q			V
20+25	2.0453	0.77	Q			V
20+30	2.0506	0.76	Q			V
20+35	2.0558	0.75	Q			V
20+40	2.0609	0.75	Q			V
20+45	2.0660	0.74	Q			V
20+50	2.0711	0.73	Q			V
20+55	2.0761	0.73	Q			V
21+ 0	2.0810	0.72	Q			V
21+ 5	2.0860	0.71	Q			V
21+10	2.0909	0.71	Q			V
21+15	2.0957	0.70	Q			V
21+20	2.1005	0.70	Q			V
21+25	2.1053	0.69	Q			V
21+30	2.1100	0.69	Q			V
21+35	2.1147	0.68	Q			V
21+40	2.1193	0.68	Q			V
21+45	2.1239	0.67	Q			V
21+50	2.1285	0.67	Q			V
21+55	2.1331	0.66	Q			V
22+ 0	2.1376	0.66	Q			V
22+ 5	2.1421	0.65	Q			V
22+10	2.1465	0.65	Q			V
22+15	2.1509	0.64	Q			V
22+20	2.1553	0.64	Q			V
22+25	2.1597	0.63	Q			V
22+30	2.1640	0.63	Q			V
22+35	2.1683	0.63	Q			V
22+40	2.1726	0.62	Q			V
22+45	2.1769	0.62	Q			V
22+50	2.1811	0.61	Q			V
22+55	2.1853	0.61	Q			V
23+ 0	2.1894	0.61	Q			V
23+ 5	2.1936	0.60	Q			V
23+10	2.1977	0.60	Q			V
23+15	2.2018	0.59	Q			V
23+20	2.2059	0.59	Q			V
23+25	2.2099	0.59	Q			V
23+30	2.2140	0.58	Q			V
23+35	2.2180	0.58	Q			V
23+40	2.2219	0.58	Q			V
23+45	2.2259	0.57	Q			V
23+50	2.2298	0.57	Q			V
23+55	2.2338	0.57	Q			V
24+ 0	2.2377	0.57	Q			V
24+ 5	2.2412	0.51	Q			V
24+10	2.2428	0.24	Q			V
24+15	2.2431	0.05	Q			V
24+20	2.2432	0.01	Q			V

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

Study date 03/13/23

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

Program License Serial Number 6279

265.24 EUCLID AVE
POST-PROJECT - AREA C2
100-YEAR 24-HOUR UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
3.47	1	1.20
Rainfall data for year 100		
3.47	6	3.00
Rainfall data for year 100		
3.47	24	6.00

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
56.0	56.0	3.47	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
     0.35   0.100         56.0      56.0       7.86     0.266
     3.12   0.900         98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.891
Area-averaged low loss fraction, Yb =  0.109
User entry of time of concentration  =   0.188 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       3.47(Ac.)
Catchment Lag time =   0.150 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 55.4078
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.073(In/Hr)
Average low loss rate fraction (Yb) = 0.109 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.444(In)
Computed peak 30-minute rainfall =  0.909(In)
Specified peak 1-hour rainfall =  1.200(In)
Computed peak 3-hour rainfall =  2.105(In)
Specified peak 6-hour rainfall =  3.000(In)
Specified peak 24-hour rainfall =  6.000(In)


Rainfall depth area reduction factors:
Using a total area of       3.47(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.444(In)
30-minute factor = 1.000    Adjusted rainfall =  0.909(In)
1-hour factor = 1.000       Adjusted rainfall =  1.200(In)
3-hour factor = 1.000       Adjusted rainfall =  2.105(In)
6-hour factor = 1.000       Adjusted rainfall =  3.000(In)
24-hour factor = 1.000      Adjusted rainfall =  6.000(In)
---------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
            (K =        41.97 (CFS))

  1                5.583                  2.343
  2               36.027                 12.776
  3               76.684                 17.062
  4               93.437                  7.030
  5               98.164                  1.984
  6               99.285                  0.471
  7              100.000                  0.300
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                 (In)
  1              0.4441               0.4441
  2              0.5859               0.1419
  3              0.6891               0.1032
```

4	0.7731	0.0840
5	0.8453	0.0722
6	0.9093	0.0640
7	0.9671	0.0578
8	1.0202	0.0531
9	1.0694	0.0492
10	1.1154	0.0460
11	1.1588	0.0433
12	1.1998	0.0410
13	1.2499	0.0501
14	1.2982	0.0483
15	1.3449	0.0466
16	1.3900	0.0451
17	1.4338	0.0438
18	1.4763	0.0425
19	1.5177	0.0414
20	1.5581	0.0403
21	1.5975	0.0394
22	1.6359	0.0385
23	1.6736	0.0376
24	1.7104	0.0368
25	1.7465	0.0361
26	1.7819	0.0354
27	1.8166	0.0347
28	1.8507	0.0341
29	1.8842	0.0335
30	1.9172	0.0330
31	1.9496	0.0324
32	1.9815	0.0319
33	2.0130	0.0314
34	2.0440	0.0310
35	2.0745	0.0305
36	2.1046	0.0301
37	2.1343	0.0297
38	2.1636	0.0293
39	2.1925	0.0289
40	2.2211	0.0286
41	2.2493	0.0282
42	2.2772	0.0279
43	2.3048	0.0276
44	2.3320	0.0273
45	2.3590	0.0270
46	2.3857	0.0267
47	2.4121	0.0264
48	2.4382	0.0261
49	2.4640	0.0258
50	2.4896	0.0256
51	2.5149	0.0253
52	2.5400	0.0251
53	2.5649	0.0249
54	2.5895	0.0246
55	2.6140	0.0244
56	2.6381	0.0242
57	2.6621	0.0240
58	2.6859	0.0238
59	2.7095	0.0236
60	2.7329	0.0234
61	2.7561	0.0232
62	2.7791	0.0230

63	2.8019	0.0228
64	2.8246	0.0227
65	2.8471	0.0225
66	2.8694	0.0223
67	2.8916	0.0222
68	2.9135	0.0220
69	2.9354	0.0218
70	2.9571	0.0217
71	2.9786	0.0215
72	3.0000	0.0214
73	3.0207	0.0208
74	3.0413	0.0206
75	3.0618	0.0205
76	3.0822	0.0203
77	3.1024	0.0202
78	3.1225	0.0201
79	3.1424	0.0200
80	3.1622	0.0198
81	3.1819	0.0197
82	3.2015	0.0196
83	3.2210	0.0195
84	3.2403	0.0193
85	3.2596	0.0192
86	3.2787	0.0191
87	3.2977	0.0190
88	3.3166	0.0189
89	3.3354	0.0188
90	3.3541	0.0187
91	3.3727	0.0186
92	3.3911	0.0185
93	3.4095	0.0184
94	3.4278	0.0183
95	3.4460	0.0182
96	3.4641	0.0181
97	3.4821	0.0180
98	3.5000	0.0179
99	3.5178	0.0178
100	3.5355	0.0177
101	3.5531	0.0176
102	3.5707	0.0175
103	3.5881	0.0175
104	3.6055	0.0174
105	3.6228	0.0173
106	3.6400	0.0172
107	3.6572	0.0171
108	3.6742	0.0170
109	3.6912	0.0170
110	3.7081	0.0169
111	3.7249	0.0168
112	3.7416	0.0167
113	3.7583	0.0167
114	3.7749	0.0166
115	3.7914	0.0165
116	3.8079	0.0164
117	3.8242	0.0164
118	3.8405	0.0163
119	3.8568	0.0162
120	3.8730	0.0162
121	3.8891	0.0161

122	3.9051	0.0160
123	3.9211	0.0160
124	3.9370	0.0159
125	3.9528	0.0158
126	3.9686	0.0158
127	3.9843	0.0157
128	4.0000	0.0157
129	4.0156	0.0156
130	4.0311	0.0155
131	4.0466	0.0155
132	4.0620	0.0154
133	4.0773	0.0154
134	4.0926	0.0153
135	4.1079	0.0152
136	4.1231	0.0152
137	4.1382	0.0151
138	4.1533	0.0151
139	4.1683	0.0150
140	4.1833	0.0150
141	4.1982	0.0149
142	4.2130	0.0149
143	4.2279	0.0148
144	4.2426	0.0148
145	4.2573	0.0147
146	4.2720	0.0147
147	4.2866	0.0146
148	4.3011	0.0146
149	4.3156	0.0145
150	4.3301	0.0145
151	4.3445	0.0144
152	4.3589	0.0144
153	4.3732	0.0143
154	4.3875	0.0143
155	4.4017	0.0142
156	4.4158	0.0142
157	4.4300	0.0141
158	4.4441	0.0141
159	4.4581	0.0140
160	4.4721	0.0140
161	4.4861	0.0140
162	4.5000	0.0139
163	4.5138	0.0139
164	4.5277	0.0138
165	4.5414	0.0138
166	4.5552	0.0137
167	4.5689	0.0137
168	4.5825	0.0137
169	4.5962	0.0136
170	4.6097	0.0136
171	4.6233	0.0135
172	4.6368	0.0135
173	4.6502	0.0135
174	4.6637	0.0134
175	4.6770	0.0134
176	4.6904	0.0133
177	4.7037	0.0133
178	4.7170	0.0133
179	4.7302	0.0132
180	4.7434	0.0132

181	4.7565	0.0132
182	4.7697	0.0131
183	4.7828	0.0131
184	4.7958	0.0130
185	4.8088	0.0130
186	4.8218	0.0130
187	4.8347	0.0129
188	4.8476	0.0129
189	4.8605	0.0129
190	4.8734	0.0128
191	4.8862	0.0128
192	4.8989	0.0128
193	4.9117	0.0127
194	4.9244	0.0127
195	4.9371	0.0127
196	4.9497	0.0126
197	4.9623	0.0126
198	4.9749	0.0126
199	4.9875	0.0125
200	5.0000	0.0125
201	5.0125	0.0125
202	5.0249	0.0125
203	5.0373	0.0124
204	5.0497	0.0124
205	5.0621	0.0124
206	5.0744	0.0123
207	5.0867	0.0123
208	5.0990	0.0123
209	5.1112	0.0122
210	5.1234	0.0122
211	5.1356	0.0122
212	5.1478	0.0122
213	5.1599	0.0121
214	5.1720	0.0121
215	5.1841	0.0121
216	5.1961	0.0120
217	5.2081	0.0120
218	5.2201	0.0120
219	5.2321	0.0120
220	5.2440	0.0119
221	5.2559	0.0119
222	5.2678	0.0119
223	5.2796	0.0119
224	5.2915	0.0118
225	5.3033	0.0118
226	5.3150	0.0118
227	5.3268	0.0117
228	5.3385	0.0117
229	5.3502	0.0117
230	5.3619	0.0117
231	5.3735	0.0116
232	5.3851	0.0116
233	5.3967	0.0116
234	5.4083	0.0116
235	5.4198	0.0115
236	5.4314	0.0115
237	5.4429	0.0115
238	5.4543	0.0115
239	5.4658	0.0114

240	5.4772	0.0114
241	5.4886	0.0114
242	5.5000	0.0114
243	5.5113	0.0114
244	5.5227	0.0113
245	5.5340	0.0113
246	5.5452	0.0113
247	5.5565	0.0113
248	5.5677	0.0112
249	5.5790	0.0112
250	5.5901	0.0112
251	5.6013	0.0112
252	5.6125	0.0111
253	5.6236	0.0111
254	5.6347	0.0111
255	5.6458	0.0111
256	5.6568	0.0111
257	5.6679	0.0110
258	5.6789	0.0110
259	5.6899	0.0110
260	5.7008	0.0110
261	5.7118	0.0110
262	5.7227	0.0109
263	5.7336	0.0109
264	5.7445	0.0109
265	5.7554	0.0109
266	5.7663	0.0108
267	5.7771	0.0108
268	5.7879	0.0108
269	5.7987	0.0108
270	5.8094	0.0108
271	5.8202	0.0107
272	5.8309	0.0107
273	5.8416	0.0107
274	5.8523	0.0107
275	5.8630	0.0107
276	5.8736	0.0107
277	5.8843	0.0106
278	5.8949	0.0106
279	5.9055	0.0106
280	5.9161	0.0106
281	5.9266	0.0106
282	5.9371	0.0105
283	5.9477	0.0105
284	5.9582	0.0105
285	5.9686	0.0105
286	5.9791	0.0105
287	5.9895	0.0104
288	6.0000	0.0104

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0104	0.0011	0.0093
2	0.0104	0.0011	0.0093
3	0.0105	0.0011	0.0093
4	0.0105	0.0011	0.0094
5	0.0105	0.0011	0.0094

6	0.0106	0.0012	0.0094
7	0.0106	0.0012	0.0094
8	0.0106	0.0012	0.0095
9	0.0107	0.0012	0.0095
10	0.0107	0.0012	0.0095
11	0.0107	0.0012	0.0095
12	0.0107	0.0012	0.0096
13	0.0108	0.0012	0.0096
14	0.0108	0.0012	0.0096
15	0.0108	0.0012	0.0096
16	0.0108	0.0012	0.0097
17	0.0109	0.0012	0.0097
18	0.0109	0.0012	0.0097
19	0.0110	0.0012	0.0098
20	0.0110	0.0012	0.0098
21	0.0110	0.0012	0.0098
22	0.0110	0.0012	0.0098
23	0.0111	0.0012	0.0099
24	0.0111	0.0012	0.0099
25	0.0111	0.0012	0.0099
26	0.0112	0.0012	0.0100
27	0.0112	0.0012	0.0100
28	0.0112	0.0012	0.0100
29	0.0113	0.0012	0.0101
30	0.0113	0.0012	0.0101
31	0.0114	0.0012	0.0101
32	0.0114	0.0012	0.0101
33	0.0114	0.0012	0.0102
34	0.0114	0.0012	0.0102
35	0.0115	0.0013	0.0102
36	0.0115	0.0013	0.0103
37	0.0116	0.0013	0.0103
38	0.0116	0.0013	0.0103
39	0.0116	0.0013	0.0104
40	0.0117	0.0013	0.0104
41	0.0117	0.0013	0.0104
42	0.0117	0.0013	0.0105
43	0.0118	0.0013	0.0105
44	0.0118	0.0013	0.0105
45	0.0119	0.0013	0.0106
46	0.0119	0.0013	0.0106
47	0.0120	0.0013	0.0107
48	0.0120	0.0013	0.0107
49	0.0120	0.0013	0.0107
50	0.0121	0.0013	0.0108
51	0.0121	0.0013	0.0108
52	0.0122	0.0013	0.0108
53	0.0122	0.0013	0.0109
54	0.0122	0.0013	0.0109
55	0.0123	0.0013	0.0110
56	0.0123	0.0013	0.0110
57	0.0124	0.0014	0.0110
58	0.0124	0.0014	0.0111
59	0.0125	0.0014	0.0111
60	0.0125	0.0014	0.0112
61	0.0126	0.0014	0.0112
62	0.0126	0.0014	0.0112
63	0.0127	0.0014	0.0113
64	0.0127	0.0014	0.0113

65	0.0128	0.0014	0.0114
66	0.0128	0.0014	0.0114
67	0.0129	0.0014	0.0115
68	0.0129	0.0014	0.0115
69	0.0130	0.0014	0.0116
70	0.0130	0.0014	0.0116
71	0.0131	0.0014	0.0117
72	0.0131	0.0014	0.0117
73	0.0132	0.0014	0.0118
74	0.0132	0.0014	0.0118
75	0.0133	0.0015	0.0119
76	0.0133	0.0015	0.0119
77	0.0134	0.0015	0.0120
78	0.0135	0.0015	0.0120
79	0.0135	0.0015	0.0121
80	0.0136	0.0015	0.0121
81	0.0137	0.0015	0.0122
82	0.0137	0.0015	0.0122
83	0.0138	0.0015	0.0123
84	0.0138	0.0015	0.0123
85	0.0139	0.0015	0.0124
86	0.0140	0.0015	0.0124
87	0.0140	0.0015	0.0125
88	0.0141	0.0015	0.0125
89	0.0142	0.0015	0.0126
90	0.0142	0.0016	0.0127
91	0.0143	0.0016	0.0128
92	0.0144	0.0016	0.0128
93	0.0145	0.0016	0.0129
94	0.0145	0.0016	0.0129
95	0.0146	0.0016	0.0130
96	0.0147	0.0016	0.0131
97	0.0148	0.0016	0.0131
98	0.0148	0.0016	0.0132
99	0.0149	0.0016	0.0133
100	0.0150	0.0016	0.0133
101	0.0151	0.0016	0.0134
102	0.0151	0.0017	0.0135
103	0.0152	0.0017	0.0136
104	0.0153	0.0017	0.0136
105	0.0154	0.0017	0.0137
106	0.0155	0.0017	0.0138
107	0.0156	0.0017	0.0139
108	0.0157	0.0017	0.0139
109	0.0158	0.0017	0.0141
110	0.0158	0.0017	0.0141
111	0.0160	0.0017	0.0142
112	0.0160	0.0017	0.0143
113	0.0162	0.0018	0.0144
114	0.0162	0.0018	0.0145
115	0.0164	0.0018	0.0146
116	0.0164	0.0018	0.0147
117	0.0166	0.0018	0.0148
118	0.0167	0.0018	0.0148
119	0.0168	0.0018	0.0150
120	0.0169	0.0018	0.0151
121	0.0170	0.0019	0.0152
122	0.0171	0.0019	0.0153
123	0.0173	0.0019	0.0154

124	0.0174	0.0019	0.0155
125	0.0175	0.0019	0.0156
126	0.0176	0.0019	0.0157
127	0.0178	0.0019	0.0159
128	0.0179	0.0020	0.0159
129	0.0181	0.0020	0.0161
130	0.0182	0.0020	0.0162
131	0.0184	0.0020	0.0164
132	0.0185	0.0020	0.0165
133	0.0187	0.0020	0.0166
134	0.0188	0.0021	0.0167
135	0.0190	0.0021	0.0169
136	0.0191	0.0021	0.0170
137	0.0193	0.0021	0.0172
138	0.0195	0.0021	0.0173
139	0.0197	0.0021	0.0176
140	0.0198	0.0022	0.0177
141	0.0201	0.0022	0.0179
142	0.0202	0.0022	0.0180
143	0.0205	0.0022	0.0182
144	0.0206	0.0022	0.0184
145	0.0214	0.0023	0.0190
146	0.0215	0.0023	0.0192
147	0.0218	0.0024	0.0195
148	0.0220	0.0024	0.0196
149	0.0223	0.0024	0.0199
150	0.0225	0.0025	0.0200
151	0.0228	0.0025	0.0203
152	0.0230	0.0025	0.0205
153	0.0234	0.0026	0.0208
154	0.0236	0.0026	0.0210
155	0.0240	0.0026	0.0214
156	0.0242	0.0026	0.0216
157	0.0246	0.0027	0.0219
158	0.0249	0.0027	0.0222
159	0.0253	0.0028	0.0226
160	0.0256	0.0028	0.0228
161	0.0261	0.0028	0.0233
162	0.0264	0.0029	0.0235
163	0.0270	0.0029	0.0240
164	0.0273	0.0030	0.0243
165	0.0279	0.0030	0.0248
166	0.0282	0.0031	0.0251
167	0.0289	0.0032	0.0258
168	0.0293	0.0032	0.0261
169	0.0301	0.0033	0.0268
170	0.0305	0.0033	0.0272
171	0.0314	0.0034	0.0280
172	0.0319	0.0035	0.0284
173	0.0330	0.0036	0.0294
174	0.0335	0.0037	0.0299
175	0.0347	0.0038	0.0309
176	0.0354	0.0039	0.0315
177	0.0368	0.0040	0.0328
178	0.0376	0.0041	0.0335
179	0.0394	0.0043	0.0351
180	0.0403	0.0044	0.0359
181	0.0425	0.0046	0.0379
182	0.0438	0.0048	0.0390

183	0.0466	0.0051	0.0415
184	0.0483	0.0053	0.0430
185	0.0410	0.0045	0.0366
186	0.0433	0.0047	0.0386
187	0.0492	0.0054	0.0438
188	0.0531	0.0058	0.0473
189	0.0640	0.0061	0.0578
190	0.0722	0.0061	0.0661
191	0.1032	0.0061	0.0971
192	0.1419	0.0061	0.1358
193	0.4441	0.0061	0.4379
194	0.0840	0.0061	0.0779
195	0.0578	0.0061	0.0517
196	0.0460	0.0050	0.0410
197	0.0501	0.0055	0.0447
198	0.0451	0.0049	0.0402
199	0.0414	0.0045	0.0369
200	0.0385	0.0042	0.0343
201	0.0361	0.0039	0.0322
202	0.0341	0.0037	0.0304
203	0.0324	0.0035	0.0289
204	0.0310	0.0034	0.0276
205	0.0297	0.0032	0.0265
206	0.0286	0.0031	0.0255
207	0.0276	0.0030	0.0246
208	0.0267	0.0029	0.0238
209	0.0258	0.0028	0.0230
210	0.0251	0.0027	0.0224
211	0.0244	0.0027	0.0218
212	0.0238	0.0026	0.0212
213	0.0232	0.0025	0.0207
214	0.0227	0.0025	0.0202
215	0.0222	0.0024	0.0197
216	0.0217	0.0024	0.0193
217	0.0208	0.0023	0.0185
218	0.0203	0.0022	0.0181
219	0.0200	0.0022	0.0178
220	0.0196	0.0021	0.0174
221	0.0192	0.0021	0.0171
222	0.0189	0.0021	0.0168
223	0.0186	0.0020	0.0166
224	0.0183	0.0020	0.0163
225	0.0180	0.0020	0.0160
226	0.0177	0.0019	0.0158
227	0.0175	0.0019	0.0156
228	0.0172	0.0019	0.0153
229	0.0170	0.0019	0.0151
230	0.0167	0.0018	0.0149
231	0.0165	0.0018	0.0147
232	0.0163	0.0018	0.0145
233	0.0161	0.0018	0.0143
234	0.0159	0.0017	0.0142
235	0.0157	0.0017	0.0140
236	0.0155	0.0017	0.0138
237	0.0154	0.0017	0.0137
238	0.0152	0.0017	0.0135
239	0.0150	0.0016	0.0134
240	0.0149	0.0016	0.0132
241	0.0147	0.0016	0.0131

242	0.0146	0.0016	0.0130
243	0.0144	0.0016	0.0128
244	0.0143	0.0016	0.0127
245	0.0141	0.0015	0.0126
246	0.0140	0.0015	0.0125
247	0.0139	0.0015	0.0124
248	0.0137	0.0015	0.0122
249	0.0136	0.0015	0.0121
250	0.0135	0.0015	0.0120
251	0.0134	0.0015	0.0119
252	0.0133	0.0014	0.0118
253	0.0132	0.0014	0.0117
254	0.0130	0.0014	0.0116
255	0.0129	0.0014	0.0115
256	0.0128	0.0014	0.0114
257	0.0127	0.0014	0.0114
258	0.0126	0.0014	0.0113
259	0.0125	0.0014	0.0112
260	0.0125	0.0014	0.0111
261	0.0124	0.0013	0.0110
262	0.0123	0.0013	0.0109
263	0.0122	0.0013	0.0109
264	0.0121	0.0013	0.0108
265	0.0120	0.0013	0.0107
266	0.0119	0.0013	0.0106
267	0.0119	0.0013	0.0106
268	0.0118	0.0013	0.0105
269	0.0117	0.0013	0.0104
270	0.0116	0.0013	0.0104
271	0.0115	0.0013	0.0103
272	0.0115	0.0013	0.0102
273	0.0114	0.0012	0.0102
274	0.0113	0.0012	0.0101
275	0.0113	0.0012	0.0100
276	0.0112	0.0012	0.0100
277	0.0111	0.0012	0.0099
278	0.0111	0.0012	0.0099
279	0.0110	0.0012	0.0098
280	0.0109	0.0012	0.0097
281	0.0109	0.0012	0.0097
282	0.0108	0.0012	0.0096
283	0.0107	0.0012	0.0096
284	0.0107	0.0012	0.0095
285	0.0106	0.0012	0.0095
286	0.0106	0.0012	0.0094
287	0.0105	0.0011	0.0094
288	0.0105	0.0011	0.0093

```
--------------------------------------------------------------------
--------------------------------------------------------------------
Total soil rain loss =      0.59(In)
Total effective rainfall =      5.41(In)
Peak flow rate in flood hydrograph =      9.78(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R   S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))
```

```
    -----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0         2.5        5.0        7.5       10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.02  Q         |          |          |          |
  0+10       0.0011      0.14  Q         |          |          |          |
  0+15       0.0032      0.30  VQ        |          |          |          |
  0+20       0.0057      0.37  VQ        |          |          |          |
  0+25       0.0083      0.38  VQ        |          |          |          |
  0+30       0.0110      0.39  VQ        |          |          |          |
  0+35       0.0137      0.39  VQ        |          |          |          |
  0+40       0.0165      0.39  VQ        |          |          |          |
  0+45       0.0192      0.40  VQ        |          |          |          |
  0+50       0.0219      0.40  VQ        |          |          |          |
  0+55       0.0247      0.40  VQ        |          |          |          |
  1+ 0       0.0274      0.40  VQ        |          |          |          |
  1+ 5       0.0302      0.40  VQ        |          |          |          |
  1+10       0.0329      0.40  VQ        |          |          |          |
  1+15       0.0357      0.40  VQ        |          |          |          |
  1+20       0.0385      0.40  VQ        |          |          |          |
  1+25       0.0413      0.40  |Q        |          |          |          |
  1+30       0.0441      0.41  |Q        |          |          |          |
  1+35       0.0469      0.41  |Q        |          |          |          |
  1+40       0.0497      0.41  |Q        |          |          |          |
  1+45       0.0525      0.41  |Q        |          |          |          |
  1+50       0.0553      0.41  |Q        |          |          |          |
  1+55       0.0582      0.41  |Q        |          |          |          |
  2+ 0       0.0610      0.41  |Q        |          |          |          |
  2+ 5       0.0639      0.41  |Q        |          |          |          |
  2+10       0.0667      0.42  |Q        |          |          |          |
  2+15       0.0696      0.42  |Q        |          |          |          |
  2+20       0.0725      0.42  |Q        |          |          |          |
  2+25       0.0754      0.42  |Q        |          |          |          |
  2+30       0.0783      0.42  |QV       |          |          |          |
  2+35       0.0812      0.42  |QV       |          |          |          |
  2+40       0.0841      0.42  |QV       |          |          |          |
  2+45       0.0870      0.42  |QV       |          |          |          |
  2+50       0.0899      0.43  |QV       |          |          |          |
  2+55       0.0929      0.43  |QV       |          |          |          |
  3+ 0       0.0958      0.43  |QV       |          |          |          |
  3+ 5       0.0988      0.43  |QV       |          |          |          |
  3+10       0.1017      0.43  |QV       |          |          |          |
  3+15       0.1047      0.43  |QV       |          |          |          |
  3+20       0.1077      0.43  |QV       |          |          |          |
  3+25       0.1107      0.44  |QV       |          |          |          |
  3+30       0.1137      0.44  |QV       |          |          |          |
  3+35       0.1167      0.44  |QV       |          |          |          |
  3+40       0.1198      0.44  |Q V      |          |          |          |
  3+45       0.1228      0.44  |Q V      |          |          |          |
  3+50       0.1258      0.44  |Q V      |          |          |          |
  3+55       0.1289      0.44  |Q V      |          |          |          |
  4+ 0       0.1320      0.45  |Q V      |          |          |          |
  4+ 5       0.1350      0.45  |Q V      |          |          |          |
  4+10       0.1381      0.45  |Q V      |          |          |          |
  4+15       0.1412      0.45  |Q V      |          |          |          |
  4+20       0.1443      0.45  |Q V      |          |          |          |
  4+25       0.1475      0.45  |Q V      |          |          |          |
  4+30       0.1506      0.45  |Q V      |          |          |          |
  4+35       0.1537      0.46  |Q V      |          |          |          |
  4+40       0.1569      0.46  |Q  V     |          |          |          |
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4+45	0.1601	0.46	Q V				
4+50	0.1632	0.46	Q V				
4+55	0.1664	0.46	Q V				
5+ 0	0.1696	0.46	Q V				
5+ 5	0.1729	0.47	Q V				
5+10	0.1761	0.47	Q V				
5+15	0.1793	0.47	Q V				
5+20	0.1826	0.47	Q V				
5+25	0.1858	0.47	Q V				
5+30	0.1891	0.48	Q V				
5+35	0.1924	0.48	Q V				
5+40	0.1957	0.48	Q V				
5+45	0.1990	0.48	Q V				
5+50	0.2023	0.48	Q V				
5+55	0.2057	0.49	Q V				
6+ 0	0.2090	0.49	Q V				
6+ 5	0.2124	0.49	Q V				
6+10	0.2158	0.49	Q V				
6+15	0.2192	0.49	Q V				
6+20	0.2226	0.50	Q V				
6+25	0.2260	0.50	Q V				
6+30	0.2295	0.50	Q V				
6+35	0.2329	0.50	Q V				
6+40	0.2364	0.50	Q V				
6+45	0.2399	0.51	Q V				
6+50	0.2434	0.51	Q V				
6+55	0.2469	0.51	Q V				
7+ 0	0.2504	0.51	Q V				
7+ 5	0.2540	0.52	Q V				
7+10	0.2575	0.52	Q V				
7+15	0.2611	0.52	Q V				
7+20	0.2647	0.52	Q V				
7+25	0.2683	0.52	Q V				
7+30	0.2719	0.53	Q V				
7+35	0.2756	0.53	Q V				
7+40	0.2793	0.53	Q V				
7+45	0.2829	0.54	Q V				
7+50	0.2866	0.54	Q V				
7+55	0.2904	0.54	Q V				
8+ 0	0.2941	0.54	Q V				
8+ 5	0.2979	0.55	Q V				
8+10	0.3016	0.55	Q V				
8+15	0.3054	0.55	Q V				
8+20	0.3093	0.55	Q V				
8+25	0.3131	0.56	Q V				
8+30	0.3170	0.56	Q V				
8+35	0.3208	0.56	Q V				
8+40	0.3247	0.57	Q V				
8+45	0.3287	0.57	Q V				
8+50	0.3326	0.57	Q V				
8+55	0.3366	0.58	Q V				
9+ 0	0.3406	0.58	Q V				
9+ 5	0.3446	0.58	Q V				
9+10	0.3486	0.59	Q V				
9+15	0.3527	0.59	Q V				
9+20	0.3568	0.59	Q V				
9+25	0.3609	0.60	Q V				
9+30	0.3650	0.60	Q V				
9+35	0.3692	0.60	Q V				

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 9+40      0.3734      0.61  | Q      V|         |         |         |
 9+45      0.3776      0.61  | Q      V|         |         |         |
 9+50      0.3818      0.62  | Q      V|         |         |         |
 9+55      0.3861      0.62  | Q      V|         |         |         |
10+ 0      0.3904      0.62  | Q      V|         |         |         |
10+ 5      0.3947      0.63  | Q       V         |         |         |
10+10      0.3991      0.63  | Q       V         |         |         |
10+15      0.4035      0.64  | Q       V         |         |         |
10+20      0.4079      0.64  | Q       V         |         |         |
10+25      0.4123      0.65  | Q       V         |         |         |
10+30      0.4168      0.65  | Q       V         |         |         |
10+35      0.4213      0.66  | Q       V         |         |         |
10+40      0.4259      0.66  | Q       V         |         |         |
10+45      0.4305      0.67  | Q       |V        |         |         |
10+50      0.4351      0.67  | Q       |V        |         |         |
10+55      0.4397      0.68  | Q       |V        |         |         |
11+ 0      0.4444      0.68  | Q       |V        |         |         |
11+ 5      0.4492      0.69  | Q       |V        |         |         |
11+10      0.4539      0.69  | Q       |V        |         |         |
11+15      0.4587      0.70  | Q       |V        |         |         |
11+20      0.4636      0.70  | Q       |V        |         |         |
11+25      0.4685      0.71  | Q       |V        |         |         |
11+30      0.4734      0.72  | Q       | V       |         |         |
11+35      0.4784      0.72  | Q       | V       |         |         |
11+40      0.4834      0.73  | Q       | V       |         |         |
11+45      0.4885      0.74  | Q       | V       |         |         |
11+50      0.4936      0.74  | Q       | V       |         |         |
11+55      0.4988      0.75  |  Q      | V       |         |         |
12+ 0      0.5040      0.76  |  Q      | V       |         |         |
12+ 5      0.5093      0.77  |  Q      |  V      |         |         |
12+10      0.5146      0.78  |  Q      |  V      |         |         |
12+15      0.5201      0.79  |  Q      |  V      |         |         |
12+20      0.5257      0.81  |  Q      |  V      |         |         |
12+25      0.5313      0.82  |  Q      |  V      |         |         |
12+30      0.5370      0.82  |  Q      |  V      |         |         |
12+35      0.5427      0.83  |  Q      |  V      |         |         |
12+40      0.5485      0.84  |  Q      |   V     |         |         |
12+45      0.5544      0.85  |  Q      |   V     |         |         |
12+50      0.5603      0.86  |  Q      |   V     |         |         |
12+55      0.5664      0.87  |  Q      |   V     |         |         |
13+ 0      0.5724      0.88  |  Q      |   V     |         |         |
13+ 5      0.5786      0.90  |  Q      |   V     |         |         |
13+10      0.5849      0.91  |  Q      |   V     |         |         |
13+15      0.5912      0.92  |  Q      |    V    |         |         |
13+20      0.5976      0.93  |  Q      |    V    |         |         |
13+25      0.6042      0.95  |  Q      |    V    |         |         |
13+30      0.6108      0.96  |  Q      |    V    |         |         |
13+35      0.6175      0.98  |  Q      |    V    |         |         |
13+40      0.6243      0.99  |  Q      |    V    |         |         |
13+45      0.6313      1.01  |   Q     |     V   |         |         |
13+50      0.6383      1.02  |   Q     |     V   |         |         |
13+55      0.6455      1.04  |   Q     |     V   |         |         |
14+ 0      0.6528      1.06  |   Q     |     V   |         |         |
14+ 5      0.6602      1.08  |   Q     |     V   |         |         |
14+10      0.6678      1.10  |   Q     |      V  |         |         |
14+15      0.6756      1.12  |   Q     |      V  |         |         |
14+20      0.6835      1.15  |   Q     |      V  |         |         |
14+25      0.6916      1.17  |   Q     |      V  |         |         |
14+30      0.6998      1.20  |   Q     |      V  |         |         |
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14+35       0.7083      1.23  |   Q     |       V |         |         |
14+40       0.7170      1.26  |    Q    |       V |         |         |
14+45       0.7260      1.30  |    Q    |       V |         |         |
14+50       0.7351      1.33  |    Q    |       V |         |         |
14+55       0.7446      1.38  |    Q    |        V|         |         |
15+ 0       0.7544      1.42  |    Q    |        V|         |         |
15+ 5       0.7645      1.47  |    Q    |        V|         |         |
15+10       0.7751      1.53  |     Q   |        V|         |         |
15+15       0.7860      1.59  |     Q   |         V         |         |
15+20       0.7975      1.66  |     Q   |         V         |         |
15+25       0.8093      1.72  |     Q   |         V         |         |
15+30       0.8209      1.69  |     Q   |         |V        |         |
15+35       0.8322      1.63  |     Q   |         |V        |         |
15+40       0.8439      1.70  |     Q   |         |V        |         |
15+45       0.8568      1.86  |      Q  |         |V        |         |
15+50       0.8713      2.12  |       Q |         | V       |         |
15+55       0.8886      2.51  |         Q         | V       |         |
16+ 0       0.9108      3.22  |         | Q       |  V      |         |
16+ 5       0.9454      5.03  |         |         Q   V     |         |
16+10       1.0070      8.95  |         |         |    V    |    Q    |
16+15       1.0744      9.78  |         |         |      V  |        Q|
16+20       1.1123      5.50  |         |         |Q      V |         |
16+25       1.1331      3.02  |         | Q       |       V |         |
16+30       1.1478      2.13  |       Q |         |        V|         |
16+35       1.1610      1.92  |      Q  |         |        V|         |
16+40       1.1726      1.68  |     Q   |         |         V         |
16+45       1.1833      1.55  |     Q   |         |         V         |
16+50       1.1932      1.44  |    Q    |         |         V         |
16+55       1.2025      1.35  |    Q    |         |         V         |
17+ 0       1.2113      1.28  |    Q    |         |         V         |
17+ 5       1.2196      1.21  |   Q     |         |         |V        |
17+10       1.2276      1.16  |   Q     |         |         |V        |
17+15       1.2352      1.11  |   Q     |         |         |V        |
17+20       1.2426      1.07  |   Q     |         |         |V        |
17+25       1.2497      1.03  |   Q     |         |         |V        |
17+30       1.2565      1.00  |  Q      |         |         | V       |
17+35       1.2632      0.97  |  Q      |         |         | V       |
17+40       1.2696      0.94  |  Q      |         |         | V       |
17+45       1.2759      0.91  |  Q      |         |         | V       |
17+50       1.2820      0.89  |  Q      |         |         | V       |
17+55       1.2880      0.87  |  Q      |         |         | V       |
18+ 0       1.2938      0.85  |  Q      |         |         |  V      |
18+ 5       1.2995      0.83  |  Q      |         |         |  V      |
18+10       1.3050      0.80  |  Q      |         |         |  V      |
18+15       1.3104      0.78  |  Q      |         |         |  V      |
18+20       1.3156      0.76  |  Q      |         |         |  V      |
18+25       1.3208      0.75  | Q       |         |         |  V      |
18+30       1.3258      0.73  | Q       |         |         |  V      |
18+35       1.3307      0.72  | Q       |         |         |   V     |
18+40       1.3356      0.71  | Q       |         |         |   V     |
18+45       1.3404      0.69  | Q       |         |         |   V     |
18+50       1.3451      0.68  | Q       |         |         |   V     |
18+55       1.3497      0.67  | Q       |         |         |   V     |
19+ 0       1.3543      0.66  | Q       |         |         |   V     |
19+ 5       1.3588      0.65  | Q       |         |         |   V     |
19+10       1.3632      0.64  | Q       |         |         |   V     |
19+15       1.3676      0.63  | Q       |         |         |   V     |
19+20       1.3719      0.63  | Q       |         |         |    V    |
19+25       1.3761      0.62  | Q       |         |         |    V    |
```

19+30	1.3803	0.61	Q			V
19+35	1.3845	0.60	Q			V
19+40	1.3885	0.59	Q			V
19+45	1.3926	0.59	Q			V
19+50	1.3966	0.58	Q			V
19+55	1.4005	0.57	Q			V
20+ 0	1.4044	0.57	Q			V
20+ 5	1.4083	0.56	Q			V
20+10	1.4121	0.56	Q			V
20+15	1.4159	0.55	Q			V
20+20	1.4197	0.54	Q			V
20+25	1.4234	0.54	Q			V
20+30	1.4270	0.53	Q			V
20+35	1.4307	0.53	Q			V
20+40	1.4343	0.52	Q			V
20+45	1.4378	0.52	Q			V
20+50	1.4414	0.51	Q			V
20+55	1.4449	0.51	Q			V
21+ 0	1.4484	0.50	Q			V
21+ 5	1.4518	0.50	Q			V
21+10	1.4552	0.50	Q			V
21+15	1.4586	0.49	Q			V
21+20	1.4620	0.49	Q			V
21+25	1.4653	0.48	Q			V
21+30	1.4686	0.48	Q			V
21+35	1.4719	0.48	Q			V
21+40	1.4751	0.47	Q			V
21+45	1.4784	0.47	Q			V
21+50	1.4816	0.47	Q			V
21+55	1.4847	0.46	Q			V
22+ 0	1.4879	0.46	Q			V
22+ 5	1.4910	0.46	Q			V
22+10	1.4941	0.45	Q			V
22+15	1.4972	0.45	Q			V
22+20	1.5003	0.45	Q			V
22+25	1.5034	0.44	Q			V
22+30	1.5064	0.44	Q			V
22+35	1.5094	0.44	Q			V
22+40	1.5124	0.43	Q			V
22+45	1.5154	0.43	Q			V
22+50	1.5183	0.43	Q			V
22+55	1.5212	0.43	Q			V
23+ 0	1.5242	0.42	Q			V
23+ 5	1.5271	0.42	Q			V
23+10	1.5299	0.42	Q			V
23+15	1.5328	0.42	Q			V
23+20	1.5356	0.41	Q			V
23+25	1.5385	0.41	Q			V
23+30	1.5413	0.41	Q			V
23+35	1.5441	0.41	Q			V
23+40	1.5469	0.40	Q			V
23+45	1.5496	0.40	Q			V
23+50	1.5524	0.40	Q			V
23+55	1.5551	0.40	Q			V
24+ 0	1.5578	0.40	Q			V
24+ 5	1.5604	0.37	Q			V
24+10	1.5621	0.25	Q			V
24+15	1.5628	0.09	Q			V
24+20	1.5629	0.03	Q			V

```
   24+25        1.5630       0.01  Q         |         |         |        V|
   24+30        1.5630       0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

APPENDIX D: OFFSITE RATIONAL METHOD CALCULATIONS

APPENDIX D.1: RATIONAL METHOD ANALYSIS, AREAS "A"

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              San Bernardino County Rational Hydrology Program

                  (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 03/16/23
------------------------------------------------------------------------
OFFSITE RATIONAL METHOD 100-YEAR HYDROLOGY, AREA A



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


Program License Serial Number 6279

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

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      103.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   729.000(Ft.)
Top (of initial area) elevation =   788.000(Ft.)
Bottom (of initial area) elevation =   778.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01372  s(%)=       1.37
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.012 min.
Rainfall intensity =      3.514(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =     30.067(CFS)
Total initial stream area =        9.780(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
```

```
In Main Stream number: 1
Stream flow area =      9.780(Ac.)
Runoff from this stream =     30.067(CFS)
Time of concentration =   10.01 min.
Rainfall intensity =     3.514(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   656.000(Ft.)
Top (of initial area) elevation =   786.000(Ft.)
Bottom (of initial area) elevation =   778.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.01220  s(%)=       1.22
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.826 min.
Rainfall intensity =      3.553(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =     28.270(CFS)
Total initial stream area =        9.090(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      9.090(Ac.)
Runoff from this stream =     28.270(CFS)
Time of concentration =    9.83 min.
Rainfall intensity =     3.553(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     30.07     9.780     10.01    0.098      3.514
2     28.27     9.090      9.83    0.098      3.553
Qmax(1) =
         1.000 *    1.000 *    30.067) +
```

```
         0.989 *    1.000 *    28.270) + =      58.013
Qmax(2) =
         1.012 *    0.981 *    30.067) +
         1.000 *    1.000 *    28.270) + =      58.122

Total of 2 main streams to confluence:
Flow rates before confluence point:
      31.067      29.270
Maximum flow rates at confluence using above data:
       58.013       58.122
Area of streams before confluence:
        9.780        9.090
Effective area values after confluence:
       18.870       18.689


Results of confluence:
Total flow rate =     58.122(CFS)
Time of concentration =     9.826 min.
Effective stream area after confluence  =     18.689(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total =      18.87(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =   778.000(Ft.)
Downstream point elevation =   772.000(Ft.)
Channel length thru subarea  =   631.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  50.000
Slope or 'Z' of right channel bank =  50.000
Estimated mean flow rate at midpoint of channel =     72.855(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =     72.855(CFS)
Depth of flow =   0.538(Ft.), Average velocity =   4.249(Ft/s)
Channel flow top width =   58.774(Ft.)
Flow Velocity =    4.25(Ft/s)
Travel time  =    2.48 min.
Time of concentration =   12.30 min.
Critical depth =      0.617(Ft.)
 Adding area flow to channel
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 44.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.877(In/Hr)
Rainfall intensity =      3.105(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.760
Subarea runoff =     29.401(CFS) for   18.420(Ac.)
Total runoff =     87.524(CFS)
Effective area this stream =       37.11(Ac.)
Total Study Area (Main Stream No. 1) =       37.29(Ac.)
Area averaged Fm value =    0.485(In/Hr)
Depth of flow =   0.579(Ft.), Average velocity =   4.449(Ft/s)
```

```
Critical depth =      0.672(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =   772.000(Ft.)
Downstream point elevation =   752.000(Ft.)
Channel length thru subarea  =  1439.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  50.000
Slope or 'Z' of right channel bank =  50.000
Estimated mean flow rate at midpoint of channel =    108.633(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =    108.633(CFS)
Depth of flow =   0.585(Ft.), Average velocity =   5.415(Ft/s)
Channel flow top width =   63.541(Ft.)
Flow Velocity =    5.41(Ft/s)
Travel time  =    4.43 min.
Time of concentration =   16.73 min.
Critical depth =      0.734(Ft.)
 Adding area flow to channel
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 44.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.877(In/Hr)
Rainfall intensity =      2.582(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.661
Subarea runoff =     42.154(CFS) for   38.860(Ac.)
Total runoff =    129.678(CFS)
Effective area this stream =       75.97(Ac.)
Total Study Area (Main Stream No. 1) =       76.15(Ac.)
Area averaged Fm value =    0.685(In/Hr)
Depth of flow =   0.629(Ft.), Average velocity =   5.661(Ft/s)
Critical depth =      0.789(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =   752.000(Ft.)
Downstream point elevation =   736.000(Ft.)
Channel length thru subarea  =  1300.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  50.000
Slope or 'Z' of right channel bank =  50.000
Estimated mean flow rate at midpoint of channel =    151.764(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =    151.764(CFS)
Depth of flow =   0.686(Ft.), Average velocity =   5.627(Ft/s)
Channel flow top width =   73.617(Ft.)
Flow Velocity =    5.63(Ft/s)
Travel time  =    3.85 min.
Time of concentration =   20.58 min.
```

```
Critical depth =      0.844(Ft.)
 Adding area flow to channel
AGRICULTURE ROW CROPS subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Rainfall intensity =      2.280(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.667
Subarea runoff =     44.076(CFS) for   38.310(Ac.)
Total runoff =    173.754(CFS)
Effective area this stream =      114.28(Ac.)
Total Study Area (Main Stream No. 1) =      114.46(Ac.)
Area averaged Fm value =    0.591(In/Hr)
Depth of flow =   0.724(Ft.), Average velocity =   5.821(Ft/s)
Critical depth =      0.898(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      107.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =   736.000(Ft.)
Downstream point elevation =   724.000(Ft.)
Channel length thru subarea  =  1430.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =  50.000
Slope or 'Z' of right channel bank =  50.000
Estimated mean flow rate at midpoint of channel =    185.241(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =    185.241(CFS)
Depth of flow =   0.802(Ft.), Average velocity =   5.124(Ft/s)
Channel flow top width =   85.174(Ft.)
Flow Velocity =    5.12(Ft/s)
Travel time  =    4.65 min.
Time of concentration =   25.23 min.
Critical depth =      0.922(Ft.)
 Adding area flow to channel
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 64.63
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.614(In/Hr)
Rainfall intensity =      2.018(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.634
Subarea runoff =     22.887(CFS) for   39.460(Ac.)
Total runoff =    196.642(CFS)
Effective area this stream =      153.74(Ac.)
Total Study Area (Main Stream No. 1) =      153.92(Ac.)
Area averaged Fm value =    0.597(In/Hr)
Depth of flow =   0.821(Ft.), Average velocity =   5.202(Ft/s)
Critical depth =      0.945(Ft.)
End of computations, Total Study Area =          153.92 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

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

Area averaged pervious area fraction(Ap) = 0.890
Area averaged SCS curve number = 56.3

APPENDIX D.2 RATIONAL METHOD ANALYSIS, AREAS "B"

```
              San Bernardino County Rational Hydrology Program

                  (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 03/16/23
------------------------------------------------------------------------
RATIONAL METHOD ANALYSIS FOR AREA B
EXISTSING CONDITION, 100 YEAR STORM EVENT
FN: ARB100

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


Program License Serial Number 6279

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

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Initial subarea data:
Initial area flow distance =   989.500(Ft.)
Top (of initial area) elevation =   806.000(Ft.)
Bottom (of initial area) elevation =   797.000(Ft.)
Difference in elevation =     9.000(Ft.)
Slope =    0.00910  s(%)=       0.91
TC = k(0.398)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.072 min.
Rainfall intensity =      2.645(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.734
Subarea runoff =      9.547(CFS)
Total initial stream area =        4.920(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.489(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   797.000(Ft.)
End of street segment elevation =   796.000(Ft.)
Length of street segment  =   355.500(Ft.)
```

```
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     14.569(CFS)
Depth of flow =   0.529(Ft.), Average velocity =   1.741(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    1.43(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.000(Ft.)
Flow velocity =   1.74(Ft/s)
Travel time =    3.40 min.     TC =   19.48  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Rainfall intensity =      2.357(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.713
Subarea runoff =      9.940(CFS) for    6.670(Ac.)
Total runoff =     19.487(CFS)
Effective area this stream =       11.59(Ac.)
Total Study Area (Main Stream No. 1) =       11.59(Ac.)
Area averaged Fm value =    0.489(In/Hr)
Street flow at end of street =     19.487(CFS)
Half street flow at end of street =      9.744(CFS)
Depth of flow =   0.573(Ft.), Average velocity =   1.882(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    3.63(Ft.)
Flow width (from curb towards crown)=  20.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   796.000(Ft.)
End of street segment elevation =   793.000(Ft.)
Length of street segment  =   416.600(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
```

```
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     27.673(CFS)
Depth of flow =   0.554(Ft.), Average velocity =   2.917(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    2.69(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.000(Ft.)
Flow velocity =   2.92(Ft/s)
Travel time =    2.38 min.     TC =   21.86  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Rainfall intensity =      2.200(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.700
Subarea runoff =     16.262(CFS) for   11.630(Ac.)
Total runoff =     35.749(CFS)
Effective area this stream =       23.22(Ac.)
Total Study Area (Main Stream No. 1) =       23.22(Ac.)
Area averaged Fm value =    0.489(In/Hr)
Street flow at end of street =     35.749(CFS)
Half street flow at end of street =     17.875(CFS)
Depth of flow =   0.595(Ft.), Average velocity =   3.123(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    4.76(Ft.)
Flow width (from curb towards crown)=  20.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      205.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   793.000(Ft.)
End of street segment elevation =   790.000(Ft.)
Length of street segment  =   286.900(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     42.380(CFS)
Depth of flow =   0.592(Ft.), Average velocity =   3.748(Ft/s)
Warning: depth of flow exceeds top of curb
```

```
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    4.62(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.000(Ft.)
Flow velocity =   3.75(Ft/s)
Travel time =    1.28 min.     TC =   23.13  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Rainfall intensity =      2.126(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.693
Subarea runoff =     13.121(CFS) for    9.950(Ac.)
Total runoff =     48.871(CFS)
Effective area this stream =       33.17(Ac.)
Total Study Area (Main Stream No. 1) =       33.17(Ac.)
Area averaged Fm value =    0.489(In/Hr)
Street flow at end of street =     48.871(CFS)
Half street flow at end of street =     24.435(CFS)
Depth of flow =   0.617(Ft.), Average velocity =   3.892(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    5.86(Ft.)
Flow width (from curb towards crown)=  20.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   790.000(Ft.)
End of street segment elevation =   784.000(Ft.)
Length of street segment  =   729.100(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  = 100.000(Ft.)
Distance from crown to crossfall grade break  =  98.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  20.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     55.709(CFS)
Depth of flow =   0.843(Ft.), Average velocity =   4.055(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    8.82(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  35.824(Ft.)
Flow velocity =   4.05(Ft/s)
Travel time =    3.00 min.     TC =   26.13  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
```

```
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1100     Max loss rate(Fm)=     0.108(In/Hr)
Rainfall intensity =      1.976(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.720
Subarea runoff =     13.605(CFS) for   10.750(Ac.)
Total runoff =     62.475(CFS)
Effective area this stream =       43.92(Ac.)
Total Study Area (Main Stream No. 1) =       43.92(Ac.)
Area averaged Fm value =    0.396(In/Hr)
Street flow at end of street =     62.475(CFS)
Half street flow at end of street =     62.475(CFS)
Depth of flow =   0.872(Ft.), Average velocity =   4.140(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   10.29(Ft.)
Flow width (from curb towards crown)=  37.289(Ft.)


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Process from Point/Station      205.000 to Point/Station      206.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Time of concentration =    26.13 min.
Rainfall intensity =      1.976(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.733
Subarea runoff =     11.570(CFS) for    7.220(Ac.)
Total runoff =     74.045(CFS)
Effective area this stream =       51.14(Ac.)
Total Study Area (Main Stream No. 1) =       51.14(Ac.)
Area averaged Fm value =    0.367(In/Hr)


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Process from Point/Station      206.000 to Point/Station      207.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   784.000(Ft.)
End of street segment elevation =   766.000(Ft.)
Length of street segment  =  1313.900(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  = 100.000(Ft.)
Distance from crown to crossfall grade break  =  98.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  20.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     91.380(CFS)
Depth of flow =   0.905(Ft.), Average velocity =   5.471(Ft/s)
```

```
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   11.93(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  38.928(Ft.)
Flow velocity =   5.47(Ft/s)
Travel time =    4.00 min.     TC =   30.13  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 48.70
Pervious ratio(Ap) = 0.9800     Max loss rate(Fm)=     0.808(In/Hr)
Rainfall intensity =      1.814(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.614
Subarea runoff =     34.598(CFS) for   46.460(Ac.)
Total runoff =    108.643(CFS)
Effective area this stream =       97.60(Ac.)
Total Study Area (Main Stream No. 1) =       97.60(Ac.)
Area averaged Fm value =    0.577(In/Hr)
Street flow at end of street =    108.643(CFS)
Half street flow at end of street =    108.643(CFS)
Depth of flow =   0.952(Ft.), Average velocity =   5.663(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   14.26(Ft.)
Flow width (from curb towards crown)=  41.260(Ft.)


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Process from Point/Station      207.000 to Point/Station      208.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   766.000(Ft.)
End of street segment elevation =   751.000(Ft.)
Length of street segment  =  1332.700(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  = 100.000(Ft.)
Distance from crown to crossfall grade break  =  98.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  20.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =    127.493(CFS)
Depth of flow =   1.025(Ft.), Average velocity =   5.419(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   17.93(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  44.928(Ft.)
Flow velocity =   5.42(Ft/s)
Travel time =    4.10 min.     TC =   34.23  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 70.70
```

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Pervious ratio(Ap) = 0.9400     Max loss rate(Fm)=     0.490(In/Hr)
Rainfall intensity =      1.680(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.606
Subarea runoff =     37.642(CFS) for   46.100(Ac.)
Total runoff =    146.285(CFS)
Effective area this stream =      143.70(Ac.)
Total Study Area (Main Stream No. 1) =      143.70(Ac.)
Area averaged Fm value =    0.549(In/Hr)
Street flow at end of street =    146.285(CFS)
Half street flow at end of street =    146.285(CFS)
Depth of flow =   1.066(Ft.), Average velocity =   5.584(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   19.99(Ft.)
Flow width (from curb towards crown)=  46.987(Ft.)


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Process from Point/Station      208.000 to Point/Station      209.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   751.000(Ft.)
End of street segment elevation =   723.000(Ft.)
Length of street segment  =  2599.100(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  = 100.000(Ft.)
Distance from crown to crossfall grade break  =  98.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  20.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =    179.262(CFS)
Depth of flow =   1.130(Ft.), Average velocity =   5.869(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   23.16(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  50.157(Ft.)
Flow velocity =   5.87(Ft/s)
Travel time =    7.38 min.     TC =   41.61  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 75.60
Pervious ratio(Ap) = 0.9500     Max loss rate(Fm)=     0.421(In/Hr)
Rainfall intensity =      1.495(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.600
Subarea runoff =     65.883(CFS) for   93.050(Ac.)
Total runoff =    212.168(CFS)
Effective area this stream =      236.75(Ac.)
Total Study Area (Main Stream No. 1) =      236.75(Ac.)
Area averaged Fm value =    0.499(In/Hr)
Street flow at end of street =    212.168(CFS)
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Half street flow at end of street =    212.168(CFS)
Depth of flow =   1.182(Ft.), Average velocity =   6.187(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =   25.78(Ft.)
Flow width (from curb towards crown)=  52.777(Ft.)
End of computations, Total Study Area =          236.75 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.830
Area averaged SCS curve number =  59.9
```

APPENDIX E: PIPE SIZING CALCULATIONS

APPENDIX E.1: PIPE SIZING CALCULATIONS FOR LINE A SYSTEM

Worksheet for LINE A1 - R1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	4.00	ft
Discharge	89.30	ft³/s

Results

Normal Depth	2.91	ft
Flow Area	9.79	ft²
Wetted Perimeter	8.17	ft
Hydraulic Radius	1.20	ft
Top Width	3.56	ft
Critical Depth	2.87	ft
Percent Full	72.8	%
Critical Slope	0.00520	ft/ft
Velocity	9.12	ft/s
Velocity Head	1.29	ft
Specific Energy	4.20	ft
Froude Number	0.97	
Maximum Discharge	109.25	ft³/s
Discharge Full	101.57	ft³/s
Slope Full	0.00387	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	72.75	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A1 - R1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	2.91	ft
Critical Depth	2.87	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00520	ft/ft

Worksheet for LINE A1 - R2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	4.00	ft
Discharge	82.50	ft³/s

Results

Normal Depth	2.74	ft
Flow Area	9.16	ft²
Wetted Perimeter	7.79	ft
Hydraulic Radius	1.18	ft
Top Width	3.72	ft
Critical Depth	2.75	ft
Percent Full	68.4	%
Critical Slope	0.00492	ft/ft
Velocity	9.00	ft/s
Velocity Head	1.26	ft
Specific Energy	4.00	ft
Froude Number	1.01	
Maximum Discharge	109.25	ft³/s
Discharge Full	101.57	ft³/s
Slope Full	0.00330	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	68.42	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A1 - R2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	2.74	ft
Critical Depth	2.75	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00492	ft/ft

Worksheet for LINE A1 - R3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	3.00	ft
Discharge	32.50	ft³/s

Results

Normal Depth	1.83	ft
Flow Area	4.52	ft²
Wetted Perimeter	5.38	ft
Hydraulic Radius	0.84	ft
Top Width	2.93	ft
Critical Depth	1.85	ft
Percent Full	61.0	%
Critical Slope	0.00484	ft/ft
Velocity	7.19	ft/s
Velocity Head	0.80	ft
Specific Energy	2.63	ft
Froude Number	1.02	
Maximum Discharge	50.73	ft³/s
Discharge Full	47.16	ft³/s
Slope Full	0.00237	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	61.01	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A1 - R3

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.83	ft
Critical Depth	1.85	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00484	ft/ft

Worksheet for LINE A2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	16.20	ft³/s

Results

Normal Depth	1.34	ft
Flow Area	2.67	ft²
Wetted Perimeter	4.10	ft
Hydraulic Radius	0.65	ft
Top Width	2.49	ft
Critical Depth	1.36	ft
Percent Full	53.4	%
Critical Slope	0.00471	ft/ft
Velocity	6.07	ft/s
Velocity Head	0.57	ft
Specific Energy	1.91	ft
Froude Number	1.04	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00156	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	53.42	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.34	ft
Critical Depth	1.36	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00471	ft/ft

Worksheet for LINE A3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	19.70	ft³/s

Results

Normal Depth	1.51	ft
Flow Area	3.10	ft²
Wetted Perimeter	4.45	ft
Hydraulic Radius	0.70	ft
Top Width	2.44	ft
Critical Depth	1.51	ft
Percent Full	60.4	%
Critical Slope	0.00505	ft/ft
Velocity	6.35	ft/s
Velocity Head	0.63	ft
Specific Energy	2.14	ft
Froude Number	0.99	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00231	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	60.44	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A3

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.51	ft
Critical Depth	1.51	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00505	ft/ft

Worksheet for LINE A4 - R1

Project Description

Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	23.50	ft³/s

Results

Normal Depth	1.71	ft
Flow Area	3.57	ft²
Wetted Perimeter	4.86	ft
Hydraulic Radius	0.73	ft
Top Width	2.33	ft
Critical Depth	1.65	ft
Percent Full	68.3	%
Critical Slope	0.00549	ft/ft
Velocity	6.58	ft/s
Velocity Head	0.67	ft
Specific Energy	2.38	ft
Froude Number	0.94	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00328	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	68.30	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A4 - R1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.71	ft
Critical Depth	1.65	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00549	ft/ft

Worksheet for LINE A4 - R2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.00	ft
Discharge	9.00	ft³/s

Results

Normal Depth	1.07	ft
Flow Area	1.72	ft²
Wetted Perimeter	3.29	ft
Hydraulic Radius	0.52	ft
Top Width	1.99	ft
Critical Depth	1.07	ft
Percent Full	53.7	%
Critical Slope	0.00504	ft/ft
Velocity	5.24	ft/s
Velocity Head	0.43	ft
Specific Energy	1.50	ft
Froude Number	1.00	
Maximum Discharge	17.21	ft³/s
Discharge Full	16.00	ft³/s
Slope Full	0.00158	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	53.66	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A4 - R2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.07	ft
Critical Depth	1.07	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00504	ft/ft

Worksheet for LINE A5 - R1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	19.70	ft³/s

Results

Normal Depth	1.51	ft
Flow Area	3.10	ft²
Wetted Perimeter	4.45	ft
Hydraulic Radius	0.70	ft
Top Width	2.44	ft
Critical Depth	1.51	ft
Percent Full	60.4	%
Critical Slope	0.00505	ft/ft
Velocity	6.35	ft/s
Velocity Head	0.63	ft
Specific Energy	2.14	ft
Froude Number	0.99	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00231	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	60.44	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A5 - R1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.51	ft
Critical Depth	1.51	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00505	ft/ft

Worksheet for LINE A5 - R2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.00	ft
Discharge	12.80	ft³/s

Results

Normal Depth	1.35	ft
Flow Area	2.26	ft²
Wetted Perimeter	3.86	ft
Hydraulic Radius	0.59	ft
Top Width	1.87	ft
Critical Depth	1.29	ft
Percent Full	67.7	%
Critical Slope	0.00576	ft/ft
Velocity	5.66	ft/s
Velocity Head	0.50	ft
Specific Energy	1.85	ft
Froude Number	0.91	
Maximum Discharge	17.21	ft³/s
Discharge Full	16.00	ft³/s
Slope Full	0.00320	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	67.67	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE A5 - R2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.35	ft
Critical Depth	1.29	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00576	ft/ft

Worksheet for LAT A4-1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	15.40	ft³/s

Results

Normal Depth	1.30	ft
Flow Area	2.57	ft²
Wetted Perimeter	4.02	ft
Hydraulic Radius	0.64	ft
Top Width	2.50	ft
Critical Depth	1.32	ft
Percent Full	51.8	%
Critical Slope	0.00465	ft/ft
Velocity	6.00	ft/s
Velocity Head	0.56	ft
Specific Energy	1.85	ft
Froude Number	1.04	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00141	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	51.82	%
Downstream Velocity	Infinity	ft/s

Worksheet for LAT A4-1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.30	ft
Critical Depth	1.32	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00465	ft/ft

Worksheet for LAT A5-1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	20.70	ft³/s

Results

Normal Depth	1.56	ft
Flow Area	3.22	ft²
Wetted Perimeter	4.56	ft
Hydraulic Radius	0.71	ft
Top Width	2.42	ft
Critical Depth	1.55	ft
Percent Full	62.5	%
Critical Slope	0.00516	ft/ft
Velocity	6.42	ft/s
Velocity Head	0.64	ft
Specific Energy	2.20	ft
Froude Number	0.98	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00255	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	62.45	%
Downstream Velocity	Infinity	ft/s

Worksheet for LAT A5-1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.56	ft
Critical Depth	1.55	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00516	ft/ft

APPENDIX E.2 PIPE SIZING CALCULATIONS FOR LINE B SYSTEM

Worksheet for LINE B1 - R1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	3.50	ft
Discharge	52.80	ft³/s

Results

Normal Depth	2.25	ft
Flow Area	6.52	ft²
Wetted Perimeter	6.50	ft
Hydraulic Radius	1.00	ft
Top Width	3.36	ft
Critical Depth	2.27	ft
Percent Full	64.1	%
Critical Slope	0.00482	ft/ft
Velocity	8.10	ft/s
Velocity Head	1.02	ft
Specific Energy	3.26	ft
Froude Number	1.02	
Maximum Discharge	76.52	ft³/s
Discharge Full	71.14	ft³/s
Slope Full	0.00275	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	64.15	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE B1 - R1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	2.25	ft
Critical Depth	2.27	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00482	ft/ft

Worksheet for LINE B1 - R2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	3.00	ft
Discharge	27.50	ft³/s

Results

Normal Depth	1.65	ft
Flow Area	3.97	ft²
Wetted Perimeter	5.00	ft
Hydraulic Radius	0.79	ft
Top Width	2.99	ft
Critical Depth	1.70	ft
Percent Full	54.8	%
Critical Slope	0.00454	ft/ft
Velocity	6.93	ft/s
Velocity Head	0.75	ft
Specific Energy	2.39	ft
Froude Number	1.06	
Maximum Discharge	50.73	ft³/s
Discharge Full	47.16	ft³/s
Slope Full	0.00170	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	54.85	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE B1 - R2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.65	ft
Critical Depth	1.70	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00454	ft/ft

Worksheet for LINE B2 - R1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	20.40	ft³/s

Results

Normal Depth	1.55	ft
Flow Area	3.19	ft²
Wetted Perimeter	4.52	ft
Hydraulic Radius	0.70	ft
Top Width	2.43	ft
Critical Depth	1.53	ft
Percent Full	61.8	%
Critical Slope	0.00512	ft/ft
Velocity	6.40	ft/s
Velocity Head	0.64	ft
Specific Energy	2.18	ft
Froude Number	0.98	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00247	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	61.84	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE B2 - R1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.55	ft
Critical Depth	1.53	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00512	ft/ft

Worksheet for LINE B2 - R2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	15.30	ft³/s

Results

Normal Depth	1.29	ft
Flow Area	2.56	ft²
Wetted Perimeter	4.01	ft
Hydraulic Radius	0.64	ft
Top Width	2.50	ft
Critical Depth	1.32	ft
Percent Full	51.6	%
Critical Slope	0.00464	ft/ft
Velocity	5.99	ft/s
Velocity Head	0.56	ft
Specific Energy	1.85	ft
Froude Number	1.04	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00139	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	51.62	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE B2 - R2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.29	ft
Critical Depth	1.32	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00464	ft/ft

Worksheet for LAT B1-1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	17.10	ft³/s

Results

Normal Depth	1.38	ft
Flow Area	2.78	ft²
Wetted Perimeter	4.19	ft
Hydraulic Radius	0.66	ft
Top Width	2.49	ft
Critical Depth	1.40	ft
Percent Full	55.2	%
Critical Slope	0.00479	ft/ft
Velocity	6.15	ft/s
Velocity Head	0.59	ft
Specific Energy	1.97	ft
Froude Number	1.03	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00174	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	55.22	%
Downstream Velocity	Infinity	ft/s

Worksheet for LAT B1-1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.38	ft
Critical Depth	1.40	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00479	ft/ft

Worksheet for LAT B1-2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.00	ft
Discharge	12.00	ft³/s

Results

Normal Depth	1.29	ft
Flow Area	2.15	ft²
Wetted Perimeter	3.73	ft
Hydraulic Radius	0.57	ft
Top Width	1.91	ft
Critical Depth	1.24	ft
Percent Full	64.6	%
Critical Slope	0.00559	ft/ft
Velocity	5.59	ft/s
Velocity Head	0.49	ft
Specific Energy	1.78	ft
Froude Number	0.93	
Maximum Discharge	17.21	ft³/s
Discharge Full	16.00	ft³/s
Slope Full	0.00281	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	64.62	%
Downstream Velocity	Infinity	ft/s

Worksheet for LAT B1-2

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.29	ft
Critical Depth	1.24	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00559	ft/ft

Worksheet for LAT B2-1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.00	ft
Discharge	7.00	ft³/s

Results

Normal Depth	0.93	ft
Flow Area	1.42	ft²
Wetted Perimeter	2.99	ft
Hydraulic Radius	0.48	ft
Top Width	1.99	ft
Critical Depth	0.94	ft
Percent Full	46.3	%
Critical Slope	0.00476	ft/ft
Velocity	4.92	ft/s
Velocity Head	0.38	ft
Specific Energy	1.30	ft
Froude Number	1.03	
Maximum Discharge	17.21	ft³/s
Discharge Full	16.00	ft³/s
Slope Full	0.00096	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	46.27	%
Downstream Velocity	Infinity	ft/s

Worksheet for LAT B2-1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.93	ft
Critical Depth	0.94	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00476	ft/ft

APPENDIX E.3 PIPE SIZING CALCULATIONS FOR LINE C SYSTEM

Worksheet for LINE C1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00500	ft/ft
Diameter	2.50	ft
Discharge	25.90	ft³/s

Results

Normal Depth	1.84	ft
Flow Area	3.88	ft²
Wetted Perimeter	5.16	ft
Hydraulic Radius	0.75	ft
Top Width	2.20	ft
Critical Depth	1.73	ft
Percent Full	73.7	%
Critical Slope	0.00582	ft/ft
Velocity	6.68	ft/s
Velocity Head	0.69	ft
Specific Energy	2.54	ft
Froude Number	0.89	
Maximum Discharge	31.20	ft³/s
Discharge Full	29.00	ft³/s
Slope Full	0.00399	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	73.69	%
Downstream Velocity	Infinity	ft/s

Worksheet for LINE C1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.84	ft
Critical Depth	1.73	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00582	ft/ft

APPENDIX F: SUBSURFACE STORAGE SIZING CALCULATIONS

APPENDIX F.1: WATER QUALITY VOLUME CALCULATIONS

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A1 (DMA A1)

1 Project area DA 1 (ft^2): 200811.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.* 24-hrs ☐ 48-hrs ☑		
7 Compute design capture volume, DCV (ft^3) 20,247 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A2 (DMA A2)

1 Project area DA 1 (ft^2): 283575.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 28,592

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A3 (DMA A3)

1 Project area DA 1 (ft^2): 208216.8	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 20,994

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A4 (DMA A4)

1 Project area DA 1 (ft^2): 341074.8	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 34,389

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A5 (DMA A5)

1 Project area DA 1 (ft^2): 118047.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.* 24-hrs ☐ 48-hrs ☑		
7 Compute design capture volume, DCV (ft^3) 11,902 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A6 (DMA A6)

1 Project area DA 1 (ft^2): 227383.2	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.* 24-hrs ☐ 48-hrs ☑		
7 Compute design capture volume, DCV (ft^3) 22,926 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA A7 (DMA A7)

1 Project area DA 1 (ft^2): 98010	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☑
7 Compute design capture volume, DCV (ft^3) 9,882 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA B1 (DMA B1)

1 Project area DA 1 (ft^2): 185565.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Precipitation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 18,710

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA B2 (DMA B2)

1 Project area DA 1 (ft^2): 70131.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 7,071

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA B3 (DMA B3)

1 Project area DA 1 (ft^2): 230868	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.* 24-hrs ☐ 48-hrs ☑		
7 Compute design capture volume, DCV (ft^3) 23,277 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA B4 (DMA B4)

1 Project area DA 1 (ft^2): 137649.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 13,879

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA B5 (DMA B5)

1 Project area DA 1 (ft^2): 81021.6	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.* 24-hrs ☐ 48-hrs ☑		
7 Compute design capture volume, DCV (ft^3) 8,169 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA C1 (DMA C1)

1 Project area DA 1 (ft^2): 216928.8	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *R_c = 0.858(Imp%)^3 -0.78(Imp%)^2 +0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Preciptiation (inches) 0.8440 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.* 24-hrs ☐ 48-hrs ☑		
7 Compute design capture volume, DCV (ft^3) 21,872 *DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)* *Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume
AREA C2 (DMA C2)

1 Project area DA 1 (ft^2): 151153.2	**2** Impervious area after applying preventative site design practices (Imp%): 0.9	3 Runoff Coefficient (Rc): 0.7303 *$R_c = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.57 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Precipitation (inches) 0.8440

*P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate

Use 48 hours as the default condition. Selection and use of the 24 hour drawdonw time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.

24-hrs ☐

48-hrs ☑

7 Compute design capture volume, DCV (ft^3) 15,240

*DCV = 1/12 * [Item 1 * Item 3 * Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr =1.963)*

Compute separate DCV for each outlet from the project site per schematic drawdown in Form 3-1 Item 2

APPENDIX F.2 STORAGE VOLUME REQUIRED CALCULATIONS

265.24 EUCLID MIXED USE SPECIFIC PLAN
Subsurface Basin Sizing Volume Calculations

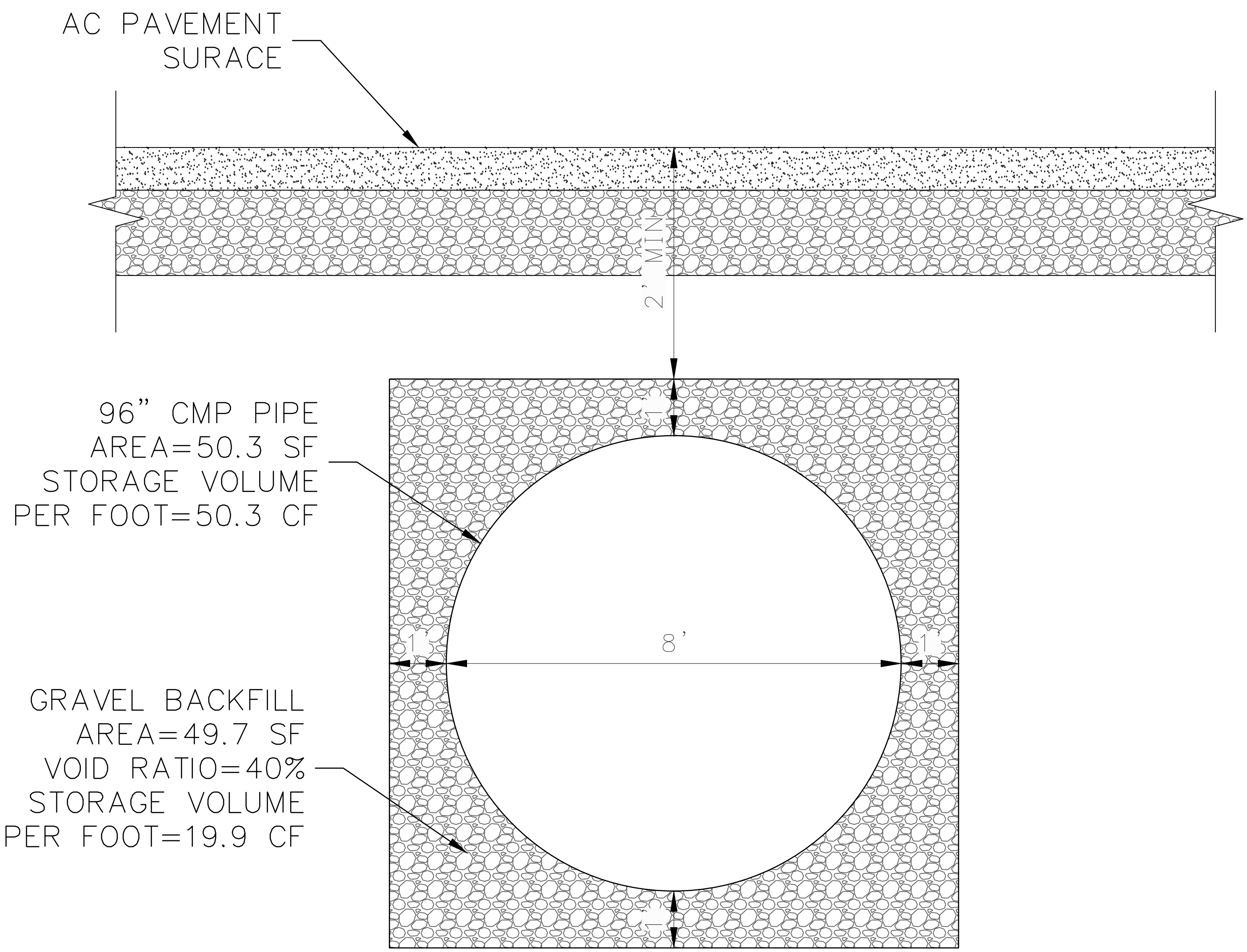
Area	Post-Project Peak Flow Rate (cfs)	Pre-Project Peak Flow Rate (cfs)	80% of Pre-Project Flow Rate (cfs)	Runoff Mitigation Volume (acres)	Runoff Mitigation Volume (cf)	Water Quality Volume (cf)	Total Volume (cf)
A1	12.93	5.32	4.26	0.296	12894	20247	33141
A2	19.41	8.69	6.95	0.415	18077	28592	46669
A3	16.12	6.96	5.57	0.281	12240	20994	33234
A4	20.73	8.14	6.51	0.583	25395	34389	59784
A5	8.54	3.80	3.04	0.172	7492	11902	19394
A6	14.62	6.34	5.07	0.334	14549	22926	37475
A7	7.59	3.28	2.62	0.132	5750	9882	15632
B1	14.63	6.26	5.01	0.250	10890	18710	29600
B2	6.18	2.96	2.37	0.093	4051	7071	11122
B3	16.13	7.20	5.76	0.337	14680	23277	37957
B4	11.38	4.97	3.98	0.185	8059	13879	21938
B5	7.14	3.45	2.76	0.107	4661	8169	12830
C1	16.40	7.17	5.74	0.293	12763	21872	34635
C2	9.78	4.15	3.32	0.222	9670	15240	24910

APPENDIX F.3 TYPICAL 96” SUBSURFACE SYSTEM CROSS-SECTION

TYPICAL 96" SUBSURFACE STORAGE CROSS SECTION AND STORAGE VOLUME PER FOOT

96" CMP SUBSURFACE STORAGE VOLUME CALCULATION

SUBSURFACE STORAGE PER FOOT=70.2 CF



AREA	REQUIRED VOLUME (CF)	MINIMUM SYSTEM LENGTH (FT)
A1	33,200	480
A2	46,700	670
A3	33,300	480
A4	59,800	860
A5	19,400	280
A6	37,500	540
A7	15,700	230
B1	29,700	430
B2	11,200	170
B3	38,000	550
B4	22,000	320
B5	12,900	190
C1	34,700	500
C2	25,000	360

EXCERPTS

EXCERPT A: CITY OF ONTARIO MASTER DRAINAGE PLAN HYDROLOGY MAP

LEGEND

- COUNTY LIMITS
- CITY LIMITS
- PLANNED STORM DRAIN, SIZE AND LINE ID
- DRAINAGE AREA BOUNDARY
- DRAINAGE SYSTEM BOUNDARY
- MINOR DRAINAGE BOUNDARY
- EXISTING CITY STORM DRAIN AND SIZE (IN INCHES)
- EXISTING COUNTY OPEN CHANNEL
- EXISTING COUNTY STORM DRAIN AND SIZE (IN INCHES)
- X — DRAINAGE AREA #

DRAINAGE SYSTEM NAME
WLKR - XII - 3 — SYSTEM IDENTIFICATION
DRAINAGE AREA NUMBER
LINE NUMBER

AREA DESIGNATION
AREA ACREAGE (IN ACRES)

Q_{10} =861.0cfs
Q_{25} =981.1cfs
Q_{100}=1213.7cfs — PEAK FLOW RATE
t=36.1 — TIME OF CONCENTRATION
A=942.7ac — AREA

SCALE: 1" = 800'

800 400 0 800 2400
GRAPHIC SCALE 1"=800'

DATE	REV.	DESCRIPTION
06-2017	1	REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016

REVISIONS
5-20-2017: REVISED TO MERGE DRAINAGE AREA XII AND XIII.

MARCH 2012

CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
HYDROLOGY MAP
NEW MODEL COLONY

HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 PH: (949) 583-1010 FX: (949) 583-0759

PLOTTED 12/12/2017 1:53 PM \\TUSFS1\HFIProject\140152\Eng\140152-0000\Hm\Hydrology Report\MPD Update\Civil 3D Files\New Model Hydrology Map Update.dwg

EXCERPT B: CITY OF ONTARIO MASTER DRAINAGE PLAN PLANED FACILITIES MAP


CITY OF ONTARIO
MONTCLAIR
UPLAND
RANCHO CUCAMONGA
S.B. COUNTY
FONTANA
CHINO
EASTVALE
JURUPA VALLEY
SAN BERNARDINO/ RIVERSIDE COUNTY LINE
PROJECT SITE
CHINO AIRPORT
CUCAMONGA-GUASTI REGIONAL PARK
WINEVILLE BASIN
RIVERSIDE BASIN
ELY BASINS
GROVE AVE BASIN
LOWER CUCAMONGA SPREADING GROUNDS
CHRIS BASIN
TURNER BASINS
PRINCETON BASIN
8th ST BASINS
LEGEND
PLANNED STORM DRAIN, SIZE AND LINE ID
COUNTY LIMIT
CITY LIMIT
DRAINAGE AREA BOUNDARY
DRAINAGE SYSTEM BOUNDARY
EXISTING COUNTY OPEN CHANNEL
EXISTING COUNTY STORM DRAIN AND SIZE (IN INCHES)
EXISTING CALTRANS STORM DRAIN
EXISTING GRASS LINED CHANNEL (MAINTAINED BY PROPERTY OWNER)
EXISTING CITY OPEN CHANNEL
EXISTING CITY STORM DRAIN AND SIZE (IN INCHES)
FUTURE NEIGHBORING CITIES STORM DRAIN AND SIZE (IN INCHES)
EXISTING NEIGHBORING CITIES STORM DRAIN AND SIZE (IN INCHES)
EXISTING DETENTION BASIN (MAINTAINED BY OTHER AGENCIES)
PARALLEL TO EXISTING STORM DRAIN
DRAINAGE AREA #
DRAINAGE SYSTEM NAME
WLKR - XII - 3
DRAINAGE AREA NUMBER
LINE NUMBER
SYSTEM IDENTIFICATION
1600 800 0 1600 4800
GRAPHIC SCALE 1"=1,600'
DATE
REV.
DESCRIPTION
06-2017
REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016
EXHIBIT 8
MARCH 2012
CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
PLANNED FACILITIES MAP
F:\0641\Engineering\SY_SD Master Plan\Rpt_SD Master Plan\Exh 8 – PLANNED FACILITIES.dwg

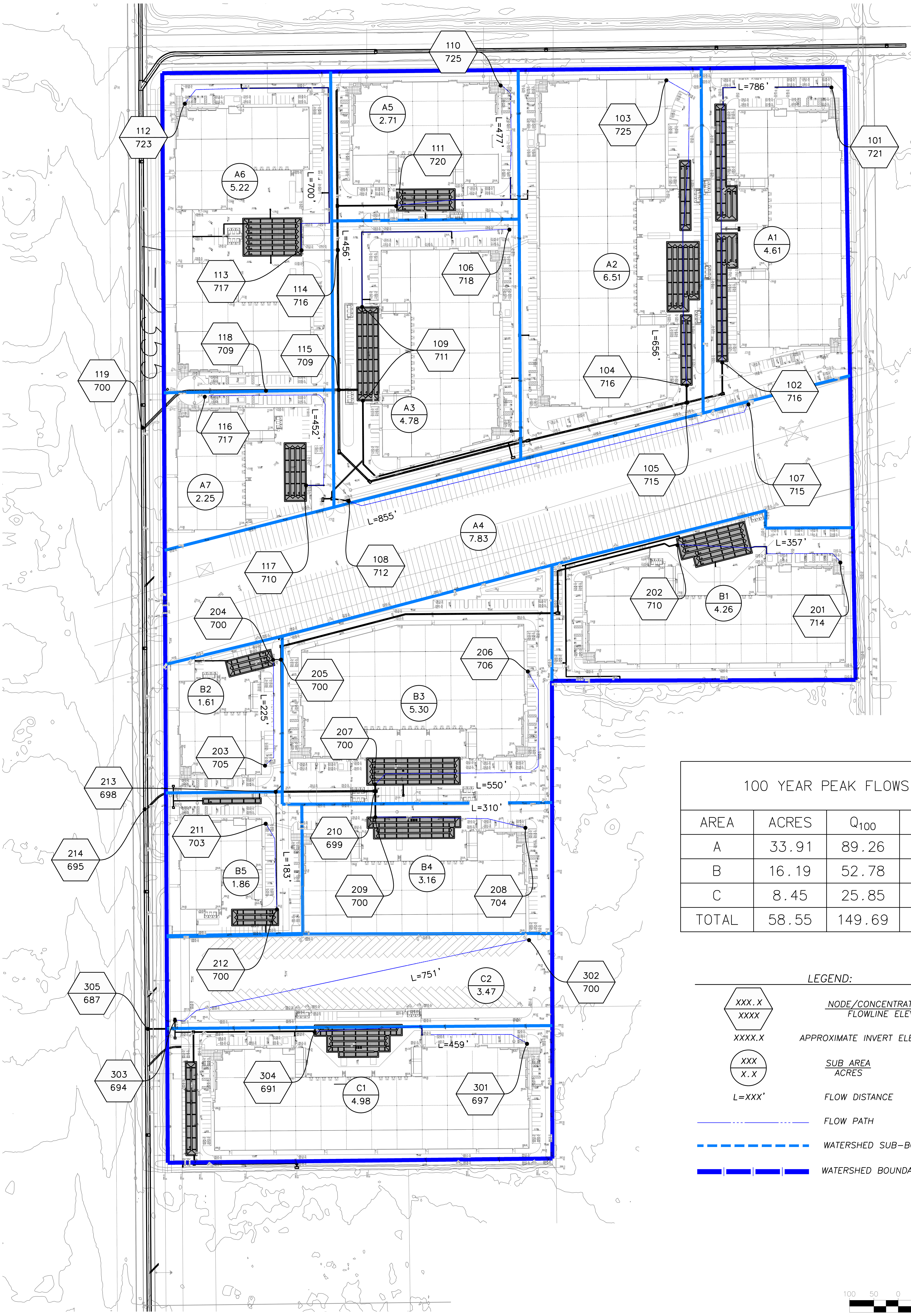
EXHIBITS

EXHIBIT A: ONSITE HYDROLOGY MAP

EUCLID MIXED USE SPECIFIC PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

ONSITE HYDROLOGY MAP



100 YEAR PEAK FLOWS			
AREA	ACRES	Q_{100}	T_C
A	33.91	89.26	12.89
B	16.19	52.78	8.24
C	8.45	25.85	9.02
TOTAL	58.55	149.69	13.36

LEGEND:

XXX.X / XXXX	NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
XXXX.X	APPROXIMATE INVERT ELEVATION
XXX / X.X	SUB AREA / ACRES
L=XXX'	FLOW DISTANCE
	FLOW PATH
	WATERSHED SUB-BOUNDARY
	WATERSHED BOUNDARY

EXHIBIT "A"

EUCLID MIXED USE SPECIFIC PLAN

ONSITE HYDROLOGY MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT B: OFFSITE HYDROLOGY MAP

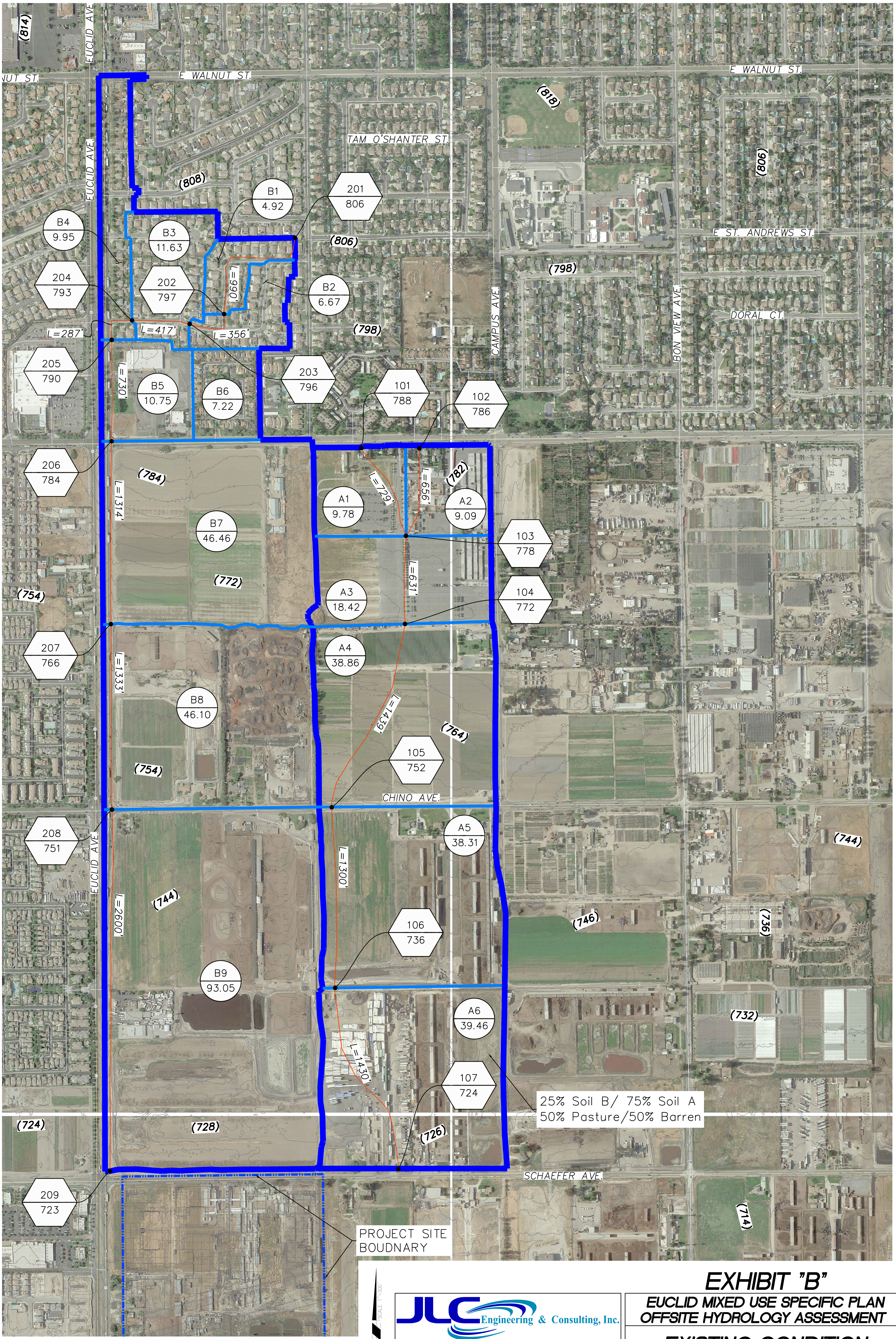


EXHIBIT "B"

EUCLID MIXED USE SPECIFIC PLAN
OFFSITE HYDROLOGY ASSESSMENT

EXISTING CONDITION
OFFSITE HYDROLOGY MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT C: ONSITE DRAINAGE FACILITIES MAP

EUCLID MIXED USE SPECIFIC PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

DRAINAGE FACILITIES MAP

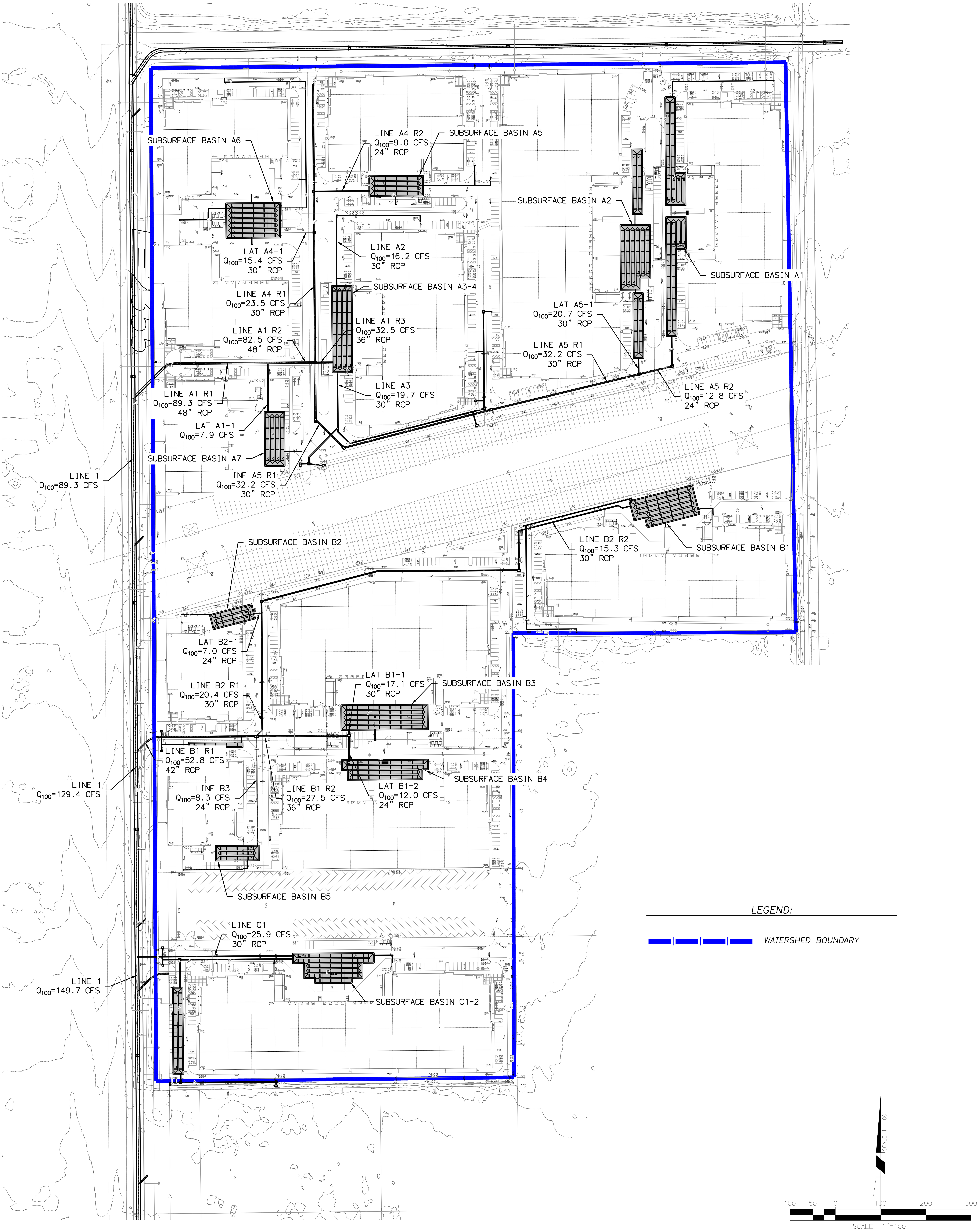


EXHIBIT C

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
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EUCLID MIXED USE SPECIFIC PLAN

DRAINAGE FACILITIES MAP

EXHIBIT D: SOILS MAP

EUCLID MIXED USE SPECIFIC PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

SOILS MAP

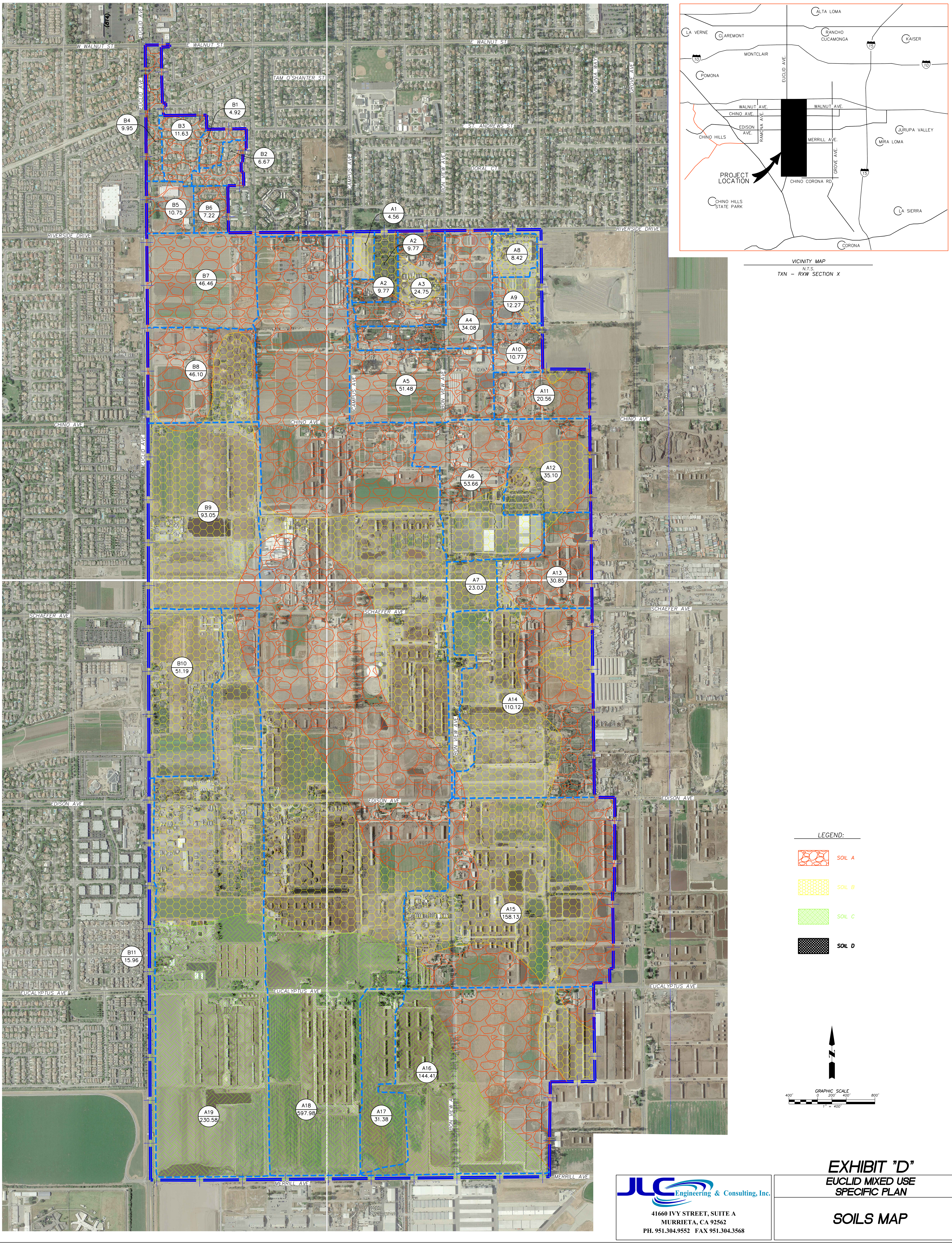

EXHIBIT "D"

EUCLID MIXED USE SPECIFIC PLAN

SOILS MAP

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A

MURRIETA, CA 92562

PH. 951.304.9552 FAX 951.304.3568

EXHIBIT E: LAND USE MAP

EUCLID MIXED USE SPECIFIC PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

LAND USE MAP

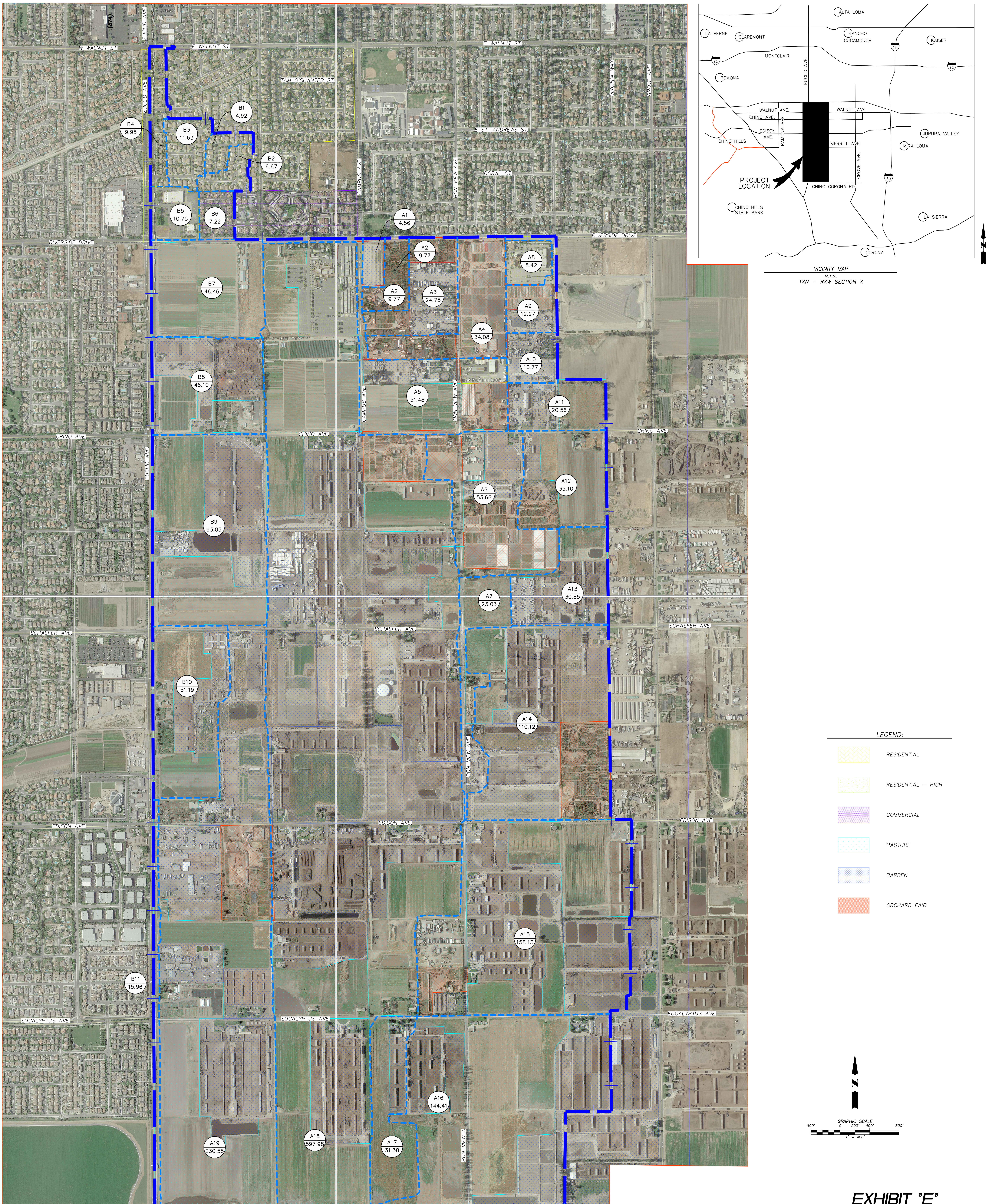

EXHIBIT "E"

EUCLID MIXED USE SPECIFIC PLAN

LAND USE MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EUCLID MIXED USE SPECIFIC PLAN

HYDRAULIC REPORT
IN SUPPORT OF
EUCLID AVENUE STORM DRAIN
(EULD-XIV-1)

CITY OF ONTARIO
CALIFORNIA

PREPARED FOR:

WESTLAND GROUP, INC.
4150 CONCOURS, ONTARIO CA

PREPARED BY:

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552
FAX 951.304.3568

MAY 10, 2023
REVISED:

EUCLID MIXED USE SPECIFIC PLAN
HYDRAULIC REPORT IN SUPPORT OF
EUCLID AVENUE STORM DRAIN (EULD-XIV-1)
ONTARIO, CA

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

05/10/2023

Joseph L. Castaneda RCE 59835 Registered Civil Engineer	Date	Seal

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FIGURES

APPENDICES

EXCERPTS

EXHIBITS

I. PURPOSE AND SCOPE

The purpose of this study is to evaluate the offsite storm drain systems located in Euclid Avenue and proposed as part of the Euclid Mixed Use Specific Plan (EMUSP) project. The EMUSP project site is located within the City of Ontario Master Drainage Plan Area XIV and plans to construct several City of Ontario Master Drainage Plan storm drain facilities.

The scope of the study includes the following:

1. Determination of the 100-year peak flow rates for the Euclid Avenue storm drain systems based on the City of Ontario Master Drainage Plan.
2. Hydraulically assess the proposed mainline storm drain systems located in Euclid Avenue.
3. Preparation of a drainage report, which consists of hydraulic and analytical results and exhibits.

II. PROJECT DESCRIPTION AND MASTER DRAINAGE PLAN OVERVIEW

Euclid Mixed Use Specific Plan (EMUSP) is a proposed industrial development within the City of Ontario. The project site is bounded by Schaefer Avenue to the north, Euclid Avenue to the west, Edison Avenue to the south, and Sultana Avenue to the east, as shown on Figure 1 Vicinity Map. The Euclid Avenue mainline storm drain systems which are the focus of this report are located on Euclid Avenue from Eucalyptus Avenue to Schaefer Avenue, as shown on Figure 1 Vicinity Map. The project site is located within the City of Ontario's Master Drainage Plan (MDP) Area XIV, see Excerpt A. The City of Ontario's Master Drainage Plan Planned Facilities Map has been included as Excerpt B.

The MDP Area XIV is approximately bounded by Riverside Drive to the north, between Bon View Avenue and Grove Avenue to the east, Merrill Avenue to the south, and Euclid Avenue to the west, see Figure 1 Vicinity Map. Runoff flows to the south and is collected in storm drain facilities which ultimately discharge into the City of Chino Line I system located south of the southwestern corner of Area XIV near the intersection of Merrill Avenue and Euclid Avenue.

As part of the PM 20016 Project (Ontario Ranch Business Park) storm drain infrastructure is being constructed along Euclid Avenue, Eucalyptus Avenue, Merrill Avenue, Sultana Avenue, Campus Avenue, and Bon View Avenue. The EMUSP project was assessed based on the downstream storm drain construction being completed and operational. The existing MDP facilities constructed per PM 20016 are shown on Figure 2.

The EMUSP project proposes the following Master Drainage Plan Facilities, as shown on Figure 3:

1. EULD-XIV-1 located on Euclid Avenue between Eucalyptus Avenue and Schaefer Avenue.

2. EULD-XIV-3 located on Edison Avenue east of Euclid Avenue
3. EULD-XIV-4 located on Schaefer Avenue east of Euclid Avenue

This report focuses on the mainline analysis for the proposed MDP systems located on Euclid Avenue:

MDP System	Location	Name used in this report and on the SD Improvement Plans	Flow Rate per MDP (see Excerpt A)
EULD-XIV-1	Euclid Ave, north of Schaefer Ave	Euclid Ave SD / Line A	338.5 ft^3/s
EULD-XIV-1	Euclid Ave, south of Schaefer Ave, north of Edison Ave	Euclid Ave SD / Line A	568.4 ft^3/s
EULD-XIV-1	Euclid Ave, south of Edison Ave	Euclid Ave SD / Line A	829.1 ft^3/s
EULD-XIV-3*	Edison Avenue	Line B	289.0 ft^3/s
EULD-XIV-4*	Schaefer Avenue	Line C	234.5 ft^3/s

*Only the portions of the EULD-XIV-3 and EULD-XIV-4 storm drain systems located within Euclid Avenue were included in the analysis for this report. Separate reports shall be prepared to assess the rest of the EULD-XIV-3 and EULD-XIV-4 systems proposed as part of the EMUSP project.

III. OFFSITE HYDRAULICS

A Drainage Facilities Map has been provided, see Exhibit A. The Euclid Avenue storm drain systems were hydraulically assessed using the WSPG program.

The flow rates used for the hydraulic analysis are per the flow rates established by the City of Ontario Master Drainage Plan. The flow rates used are listed on the table in the previous section and shown on the Drainage Facilities Map, Exhibit A.

The downstream control for the Euclid Ave/Line A system was 649.82 per the storm drain plans for the downstream storm drain system. The hydraulic grade line calculated for Euclid Ave/Line A was used as the downstream control for Line B and Line C. The improvement plans for the downstream storm drain system have been included as Excerpt C.

The WSPG calculations are included in Appendix A.

IV. CONCLUSION

The study evaluated the storm drain improvements located in Euclid Avenue associated with the Euclid Mixed Use Specific Plan project. It has been concluded that:

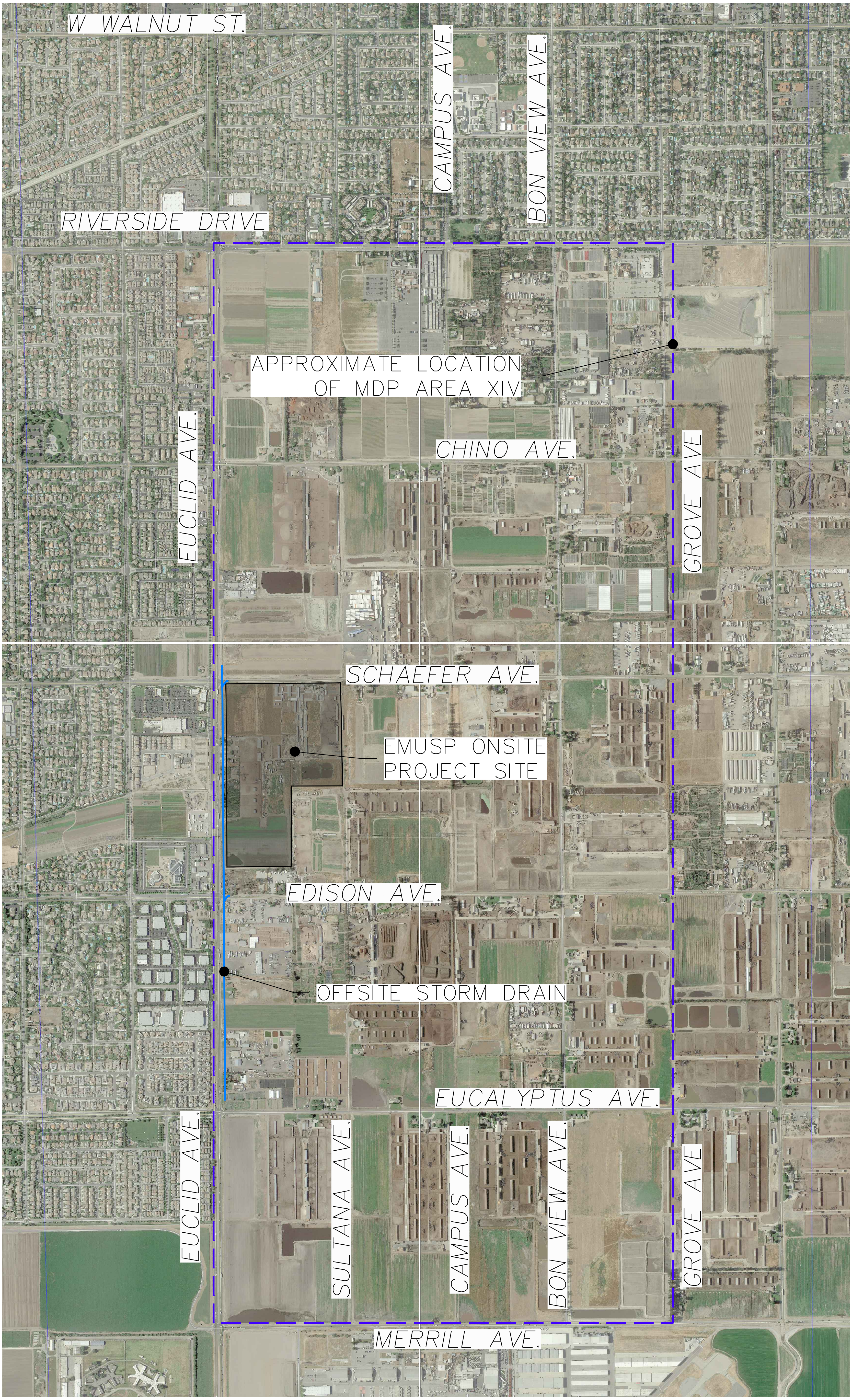
1. The proposed project is located within the City of Ontario Master Drainage Plan Area XIV which provides the regional storm drain system to flood protect the area.
2. The proposed Euclid Avenue storm drain systems are City of Ontario Master Drainage Plan planned facilities. The MDP has established flow rates for the proposed storm drain systems.
3. A hydraulic grade line has been established for the proposed storm drain systems.

V. REFERENCES

1. San Bernardino Flood Control Hydrology Manual, August 1986.
2. City of Ontario Master Plan of Drainage, Revised June 2017

FIGURES

FIGURE 1: VICINITY MAP



SCALE 1"=1200'

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits_Offsite_Hydraulics\FIGURE-1-VICINITY-MAP.dwg
Last Opened: May 10, 2023 - 10:48am by stanner

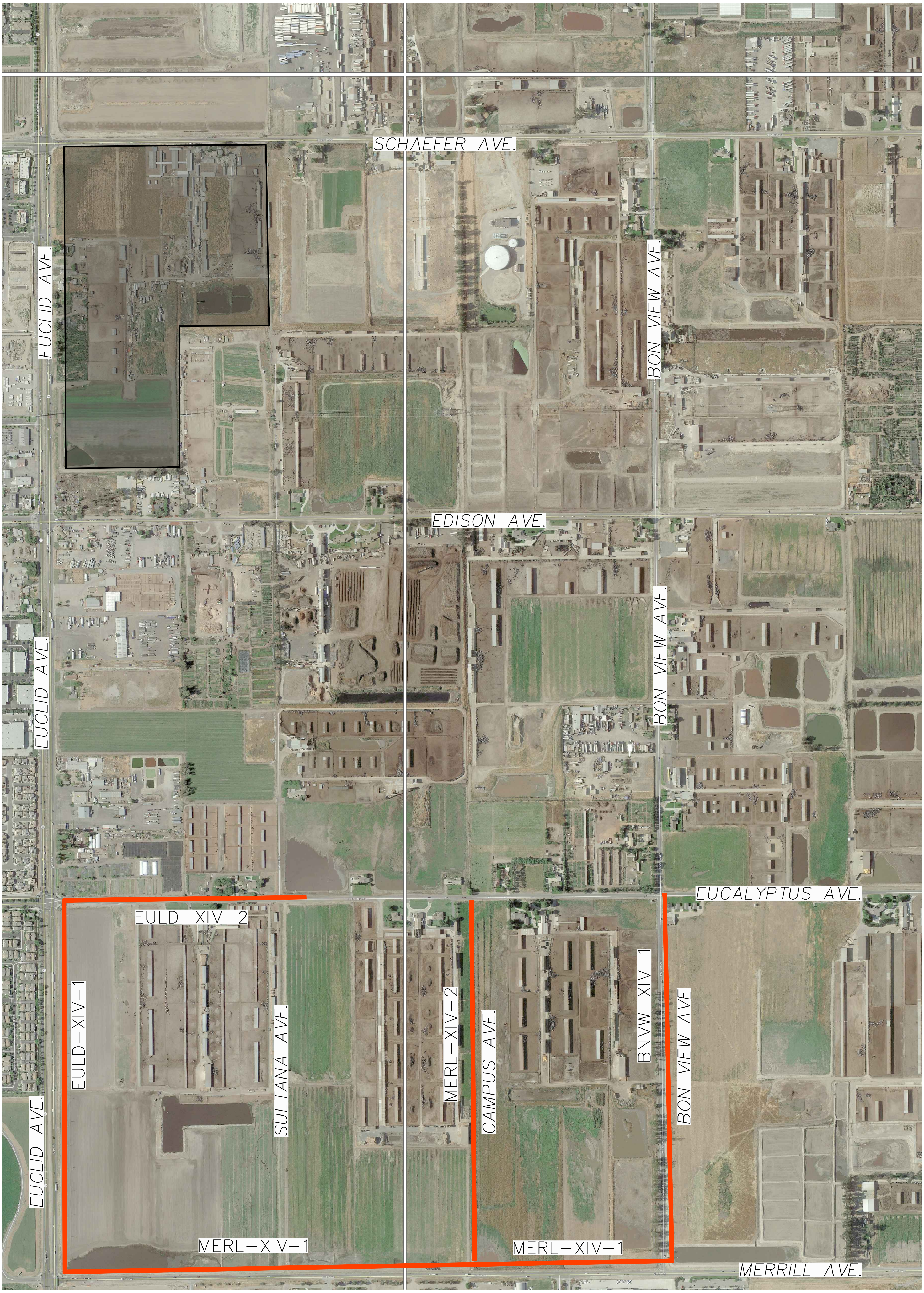
VICINITY MAP

FIGURE 1

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

FIGURE 2: EXISTING MDP DRAINAGE FACILITIES MAP

EXISTING MDP DRAINAGE FACILITIES MAP



SCALE 1"=700'

LEGEND:

EXISTING MDP SYSTEMS PER PM 20016

EMUSP ONSITE PROJECT SITE

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

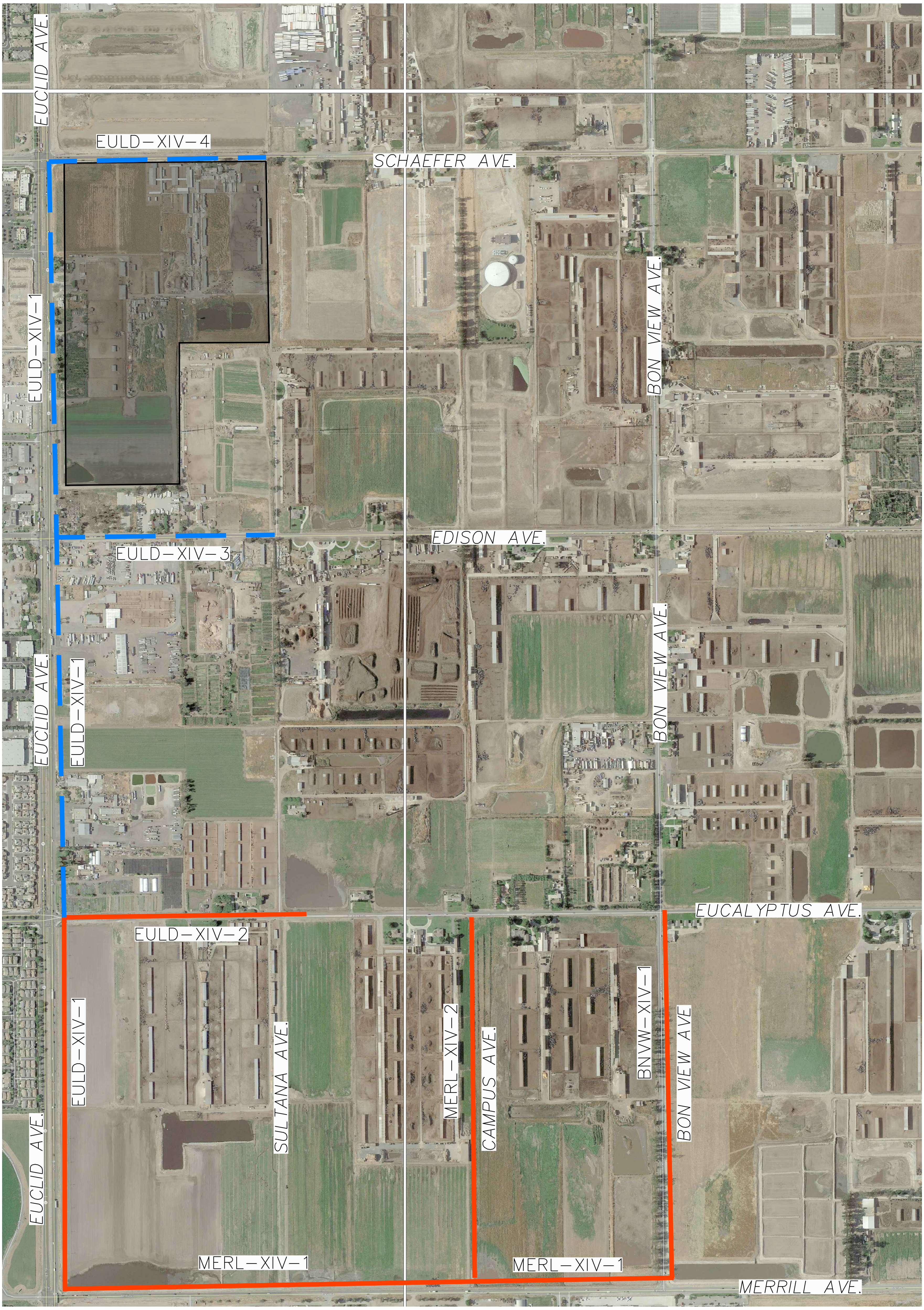
FIGURE 2

EXISTING MDP DRAINAGE FACILITIES MAP

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits_Offsite_Hydraulics\FIGURE-2-EXISTING-MDP.dwg
Last Opened: May 10, 2023 - 10:51am by stanner

FIGURE 3: PROPOSED MDP DRAINAGE FACILITIES MAP

PROPOSED MDP DRAINAGE FACILITIES MAP



SCALE 1"=700'

LEGEND:

EXISTING MDP SYSTEMS PER PM 20016

PROPOSED MDP SYSTEMS PER EMUSP

EMUSP ONSITE PROJECT SITE

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

FIGURE 3

PROPOSED MDP DRAINAGE FACILITIES MAP

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits_Offsite_Hydraulics\FIGURE-3-PROPOSED-MDP.dwg
Last Opened: May 10, 2023 - 2:02pm by stanner

APPENDICES

APPENDIX A: STORM DRAIN HYDRAULIC CALCULATIONS

APPENDIX A.1: EUCLID AVENUE WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR EUCLID AVENUE (SR83)
T3 FN: EUCLID.WSW
SO   3762.560 639.170  1                          649.820
R    3935.350 640.730  1      .013                                  .000    .000 0
R    6192.240 664.650  1      .013                                  .000    .000 0
JX   6212.400 665.150  3  2   .013  260.700         664.920          45.0         .000
R    8821.510 692.810  3      .013                                  .000    .000 0
JX   8841.670 693.310  5  4   .013  229.900         692.820          45.0         .000
R    9084.670 695.890  5      .013                                  .000    .000 0
SH   9084.670 695.890  5                          695.890
CD   1  4   1    .000   8.500     .000  .000  .000   .00
CD   2  4   1    .000   8.000     .000  .000  .000   .00
CD   3  4   1    .000   7.500     .000  .000  .000   .00
CD   4  4   1    .000   7.500     .000  .000  .000   .00
CD   5  4   1    .000   6.500     .000  .000  .000   .00
Q           338.500   .0
```

Program Package Serial Number: 7028
WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:53:48
265.24.22
WSPG RUN FOR EUCLID AVENUE (SR83)
FN: EUCLID.WSW

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
3762.560	639.170	10.650	649.820	829.10	14.61	3.31	653.13	.00	7.15	.00	8.500	.000	.00	1 .0
172.790	.0090					.0060	1.03	10.65	.00	5.82	.013	.00	.00	PIPE
3935.350	640.730	10.123	650.853	829.10	14.61	3.31	654.17	.00	7.15	.00	8.500	.000	.00	1 .0
253.820	.0106					.0060	1.52	10.12	.00	5.50	.013	.00	.00	PIPE
4189.170	643.420	8.950	652.370	829.10	14.61	3.31	655.68	.00	7.15	.00	8.500	.000	.00	1 .0
HYDRAULIC JUMP														
4189.170	643.420	5.498	648.918	829.10	21.35	7.08	656.00	.00	7.15	8.13	8.500	.000	.00	1 .0
824.484	.0106					.0106	8.74	5.50	1.72	5.50	.013	.00	.00	PIPE
5013.654	652.159	5.498	657.657	829.10	21.35	7.08	664.74	.00	7.15	8.13	8.500	.000	.00	1 .0
698.644	.0106					.0102	7.11	5.50	1.72	5.50	.013	.00	.00	PIPE
5712.297	659.563	5.664	665.227	829.10	20.64	6.62	671.84	.00	7.15	8.02	8.500	.000	.00	1 .0
255.673	.0106					.0092	2.36	5.66	1.63	5.50	.013	.00	.00	PIPE
5967.970	662.273	5.911	668.184	829.10	19.68	6.02	674.20	.00	7.15	7.82	8.500	.000	.00	1 .0
117.552	.0106					.0082	.97	5.91	1.49	5.50	.013	.00	.00	PIPE
6085.522	663.519	6.178	669.697	829.10	18.77	5.47	675.17	.00	7.15	7.58	8.500	.000	.00	1 .0
63.649	.0106					.0074	.47	6.18	1.37	5.50	.013	.00	.00	PIPE
6149.171	664.194	6.469	670.662	829.10	17.89	4.97	675.63	.00	7.15	7.25	8.500	.000	.00	1 .0
32.814	.0106					.0066	.22	6.47	1.25	5.50	.013	.00	.00	PIPE

Program Package Serial Number: 7028

WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:53:48

265.24.22

WSPG RUN FOR EUCLID AVENUE (SR83)

FN: EUCLID.WSW

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
6181.985	664.541	6.790	671.331	829.10	17.06	4.52	675.85	.00	7.15	6.82	8.500	.000	.00	1 .0
10.255	.0106					.0060	.06	6.79	1.13	5.50	.013	.00	.00	PIPE
6192.240	664.650	7.155	671.805	829.10	16.26	4.11	675.91	.00	7.15	6.21	8.500	.000	.00	1 .0
JUNCT STR	.0248					.0056	.11	7.15	1.00		.013	.00	.00	PIPE
6212.400	665.150	10.172	675.322	568.40	12.87	2.57	677.89	.00	6.14	.00	7.500	.000	.00	1 .0
474.593	.0106					.0055	2.60	10.17	.00	4.71	.013	.00	.00	PIPE
6686.993	670.181	7.741	677.922	568.40	12.87	2.57	680.49	.00	6.14	.00	7.500	.000	.00	1 .0
HYDRAULIC JUMP														
6686.993	670.181	4.707	674.889	568.40	19.47	5.89	680.78	.00	6.14	7.25	7.500	.000	.00	1 .0
1233.438	.0106					.0106	13.08	4.71	1.71	4.71	.013	.00	.00	PIPE
7920.431	683.257	4.707	687.965	568.40	19.47	5.89	693.85	.00	6.14	7.25	7.500	.000	.00	1 .0
566.900	.0106					.0101	5.70	4.71	1.71	4.71	.013	.00	.00	PIPE
8487.331	689.267	4.888	694.156	568.40	18.64	5.39	699.55	.00	6.14	7.15	7.500	.000	.00	1 .0
172.320	.0106					.0090	1.55	4.89	1.59	4.71	.013	.00	.00	PIPE
8659.651	691.094	5.099	696.193	568.40	17.77	4.90	701.10	.00	6.14	7.00	7.500	.000	.00	1 .0
84.289	.0106					.0080	.67	5.10	1.47	4.71	.013	.00	.00	PIPE
8743.940	691.988	5.325	697.313	568.40	16.94	4.46	701.77	.00	6.14	6.81	7.500	.000	.00	1 .0
46.346	.0106					.0071	.33	5.32	1.35	4.71	.013	.00	.00	PIPE

Program Package Serial Number: 7028
WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:53:48
265.24.22
WSPG RUN FOR EUCLID AVENUE (SR83)
FN: EUCLID.WSW

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
8790.286	692.479	5.570	698.049	568.40	16.16	4.05	702.10	.00	6.14	6.56	7.500	.000	.00	1 .0
23.871	.0106					.0064	.15	5.57	1.23	4.71	.013	.00	.00	PIPE
8814.157	692.732	5.838	698.570	568.40	15.40	3.68	702.25	.00	6.14	6.23	7.500	.000	.00	1 .0
7.353	.0106					.0058	.04	5.84	1.12	4.71	.013	.00	.00	PIPE
8821.510	692.810	6.139	698.949	568.40	14.69	3.35	702.30	.00	6.14	5.78	7.500	.000	.00	1 .0
JUNCT STR	.0248					.0048	.10	6.14	1.00		.013	.00	.00	PIPE
8841.670	693.310	9.234	702.544	338.50	10.20	1.62	704.16	.00	4.94	.00	6.500	.000	.00	1 .0
243.000	.0106					.0042	1.01	9.23	.00	3.73	.013	.00	.00	PIPE
9084.670	695.890	7.667	703.557	338.50	10.20	1.62	705.17	.00	4.94	.00	6.500	.000	.00	1 .0

APPENDIX A.2: LINE B WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR LINE B
T3 FN: LINEB.WSW
SO   1017.100 664.990  1                          675.322
R    1065.020 665.230  1      .013                                    .000    .000 0
R    1107.900 665.440  1      .013                                  54.597    .000 0
SH   1107.900 665.440  1                          665.440
CD   1  4   1    .000   8.000     .000  .000  .000   .00
Q           289.000   .0
```

```
FILE: LINEB.WSW                              W S P G W - CIVILDESIGN Version 14.07                                    PAGE    1
                                   Program Package Serial Number: 7028
                                                   WATER SURFACE PROFILE LISTING                      Date: 5-10-2023  Time: 2:53:54
                              265.24.22
                                WSPG RUN FOR LINE B
                                  FN: LINEB.WSW
************************************************************************************************************************************* ********
         | Invert  | Depth  | Water   |   Q     |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT)  |  Elev   | (CFS)   | (FPS)    Head  | Grd.El.  |  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-     -|-        -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|   HF     |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |               |          |        |        |        |       |       |       |
 1017.100  664.990   10.332   675.322    289.00     5.75     .51   675.84      .00     4.29      .00    8.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-        -|-      -|-      -|-      -|-     -|-     -|-     |-
   47.920    .0050                                          .0010       .05    10.33      .00     3.75    .013       .00    .00  PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
 1065.020  665.230   10.140   675.370    289.00     5.75     .51   675.88      .00     4.29      .00    8.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-        -|-      -|-      -|-      -|-     -|-     -|-     |-
   42.880    .0049                                          .0010       .04      .00      .00     3.78    .013       .00    .00  PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
 1107.900  665.440   10.053   675.493    289.00     5.75     .51   676.01      .00     4.29      .00    8.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-        -|-      -|-      -|-      -|-     -|-     -|-     |-
```

APPENDIX A.3: LINE C WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR LINE C
T3 FN: LINEC.WSW
SO   1016.150 692.890  1                           702.544
R    1079.620 693.210  1      .013                                 .000    .000 0
R    1122.560 693.420  1      .013                               54.597    .000 0
SH   1122.560 693.420  1                           693.420
CD   1  4   1    .000   7.500     .000  .000  .000   .00
Q           234.500   .0
```

FILE: LINEC.WSW W S P G W - CIVILDESIGN Version 14.07 PAGE 1

Program Package Serial Number: 7028

WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:54: 0

265.24.22

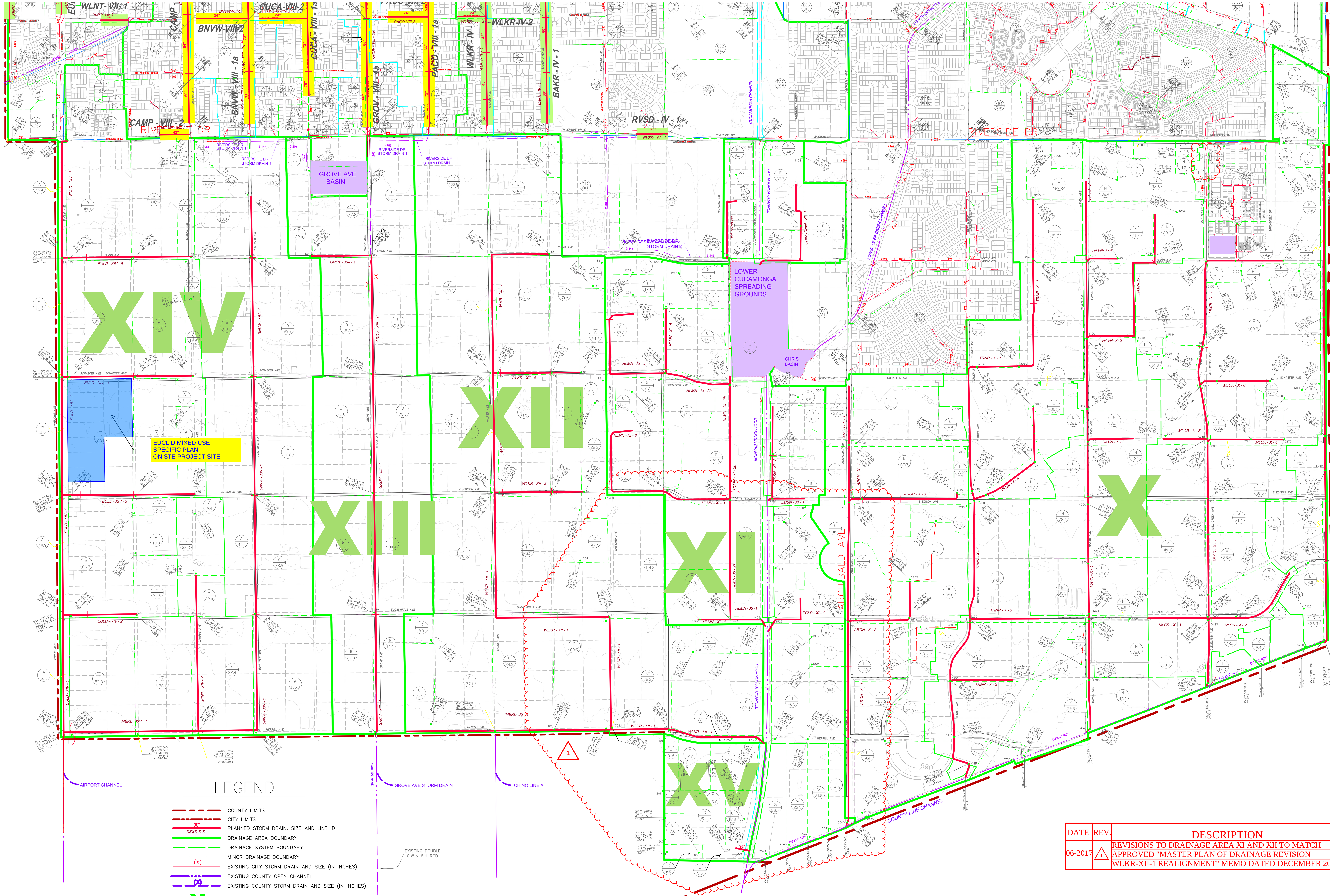
WSPG RUN FOR LINE C

FN: LINEC.WSW

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
1016.150	692.890	9.654	702.544	234.50	5.31	.44	702.98	.00	3.92	.00	7.500	.000	.00	1 .0
63.470	.0050					.0009	.06	9.65	.00	3.44	.013	.00	.00	PIPE
1079.620	693.210	9.393	702.603	234.50	5.31	.44	703.04	.00	3.92	.00	7.500	.000	.00	1 .0
42.940	.0049					.0009	.04	.00	.00	3.47	.013	.00	.00	PIPE
1122.560	693.420	9.291	702.711	234.50	5.31	.44	703.15	.00	3.92	.00	7.500	.000	.00	1 .0

EXCERPTS

EXCERPT A: CITY OF ONTARIO MASTER DRAINAGE PLAN HYDROLOGY MAP



LEGEND

- COUNTY LIMITS
- CITY LIMITS
- PLANNED STORM DRAIN, SIZE AND LINE ID
- DRAINAGE AREA BOUNDARY
- DRAINAGE SYSTEM BOUNDARY
- MINOR DRAINAGE BOUNDARY
- EXISTING CITY STORM DRAIN AND SIZE (IN INCHES)
- EXISTING COUNTY OPEN CHANNEL
- EXISTING COUNTY STORM DRAIN AND SIZE (IN INCHES)
- X DRAINAGE AREA #

DRAINAGE SYSTEM NAME
WLKR - XII - 3 SYSTEM IDENTIFICATION
DRAINAGE AREA NUMBER
LINE NUMBER

AREA DESIGNATION
AREA ACREAGE (IN ACRES)

Q_{10} =861.0cfs
Q_{25} =981.1cfs
Q_{100}=1213.7cfs
t=36.1
A=942.7ac

PEAK FLOW RATE
TIME OF CONCENTRATION
AREA

SCALE: 1" = 800'

800 400 0 800 2400
GRAPHIC SCALE 1"=800'

DATE	REV.	DESCRIPTION
06-2017	1	REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016

MARCH 2012

REVISIONS
5-20-2017: REVISED TO MERGE DRAINAGE AREA XII AND XIII.

CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
HYDROLOGY MAP
NEW MODEL COLONY

HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ■ ENGINEERING ■ SURVEYING
Three Hughes Irvine, CA 92618 PH: (949) 583-1010 FX: (949) 583-0759

PLOTTED 12/12/2017 1:53 PM \\TUSFS1\HFIProject\140152\Eng\140152-0000\Hm\Hydrology Report\MPD Update\Civil 3D Files\New Model Hydrology Map Update.dwg

EXCERPT B: CITY OF ONTARIO MASTER DRAINAGE PLAN PLANED FACILITIES MAP


CITY OF ONTARIO
MONTCLAIR
UPLAND
RANCHO CUCAMONGA
S.B. COUNTY
FONTANA
CHINO
EASTVALE
JURUPA VALLEY
SAN BERNARDINO/ RIVERSIDE COUNTY LINE
EUCLID MIXED USE SPECIFIC PLAN ONSITE PROJECT SITE
CUCAMONGA-GUASTI REGIONAL PARK
WINEVILLE BASIN
RIVERSIDE BASIN
ELY BASINS
GROVE AVE BASIN
LOWER CUCAMONGA SPREADING GROUNDS
CHRIS BASIN
TURNER BASINS
PRINCETON BASIN
8th ST BASINS
CHINO AIRPORT
LEGEND
PLANNED STORM DRAIN, SIZE AND LINE ID
COUNTY LIMIT
CITY LIMIT
DRAINAGE AREA BOUNDARY
DRAINAGE SYSTEM BOUNDARY
EXISTING COUNTY OPEN CHANNEL
EXISTING COUNTY STORM DRAIN AND SIZE (IN INCHES)
EXISTING CALTRANS STORM DRAIN
EXISTING GRASS LINED CHANNEL (MAINTAINED BY PROPERTY OWNER)
EXISTING CITY OPEN CHANNEL
EXISTING CITY STORM DRAIN AND SIZE (IN INCHES)
FUTURE NEIGHBORING CITIES STORM DRAIN AND SIZE (IN INCHES)
EXISTING NEIGHBORING CITIES STORM DRAIN AND SIZE (IN INCHES)
EXISTING DETENTION BASIN (MAINTAINED BY OTHER AGENCIES)
PARALLEL TO EXISTING STORM DRAIN
DRAINAGE AREA #
DRAINAGE SYSTEM NAME
WLKR - XII - 3
DRAINAGE AREA NUMBER
LINE NUMBER
SYSTEM IDENTIFICATION
GRAPHIC SCALE 1"=1,600'
DATE
REV.
DESCRIPTION
06-2017
REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016
EXHIBIT 8
MARCH 2012
CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
PLANNED FACILITIES MAP
F:\0641\Engineering\SY_SD Master Plan\Rpt_SD Master Plan\Exh 8 – PLANNED FACILITIES.dwg

EXCERPT C: STORM DRAIN IMPROVEMENT PLAN FOR PM-20016 EUCLID AVENUE (SR83) FROM 3350' SOUTH MERRILL AVENUE TO EUCALYPTUS AVENUE

STORM DRAIN IMPROVEMENT PLAN
FOR
PM-20016
EUCLID AVENUE (SR83)
FROM 3350' SOUTH MERRILL AVENUE TO EUCALYPTUS AVENUE
IN THE CITY OF ONTARIO

CITY OF ONTARIO GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AND CALTRANS PERMIT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS REFERRED TO SECTION 7-10.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION."

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

BASIS OF BEARING

BEARINGS ARE BASED UPON THE CENTERLINE OF EUCLID AVENUE BEING N89°26'19"E AS SHOWN ON RECORD OF SURVEY 92/97 RECORDED AS INSTRUMENT NO. 1991-447293 OF OFFICIAL RECORDS OF THE COUNTY OF SAN BERNARDINO.

811 Know what's below. Call 811 before you dig.

UTILITY PURVEYORS:

CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA EDISON
24-HOUR EMERGENCY: (800) 611-1911

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

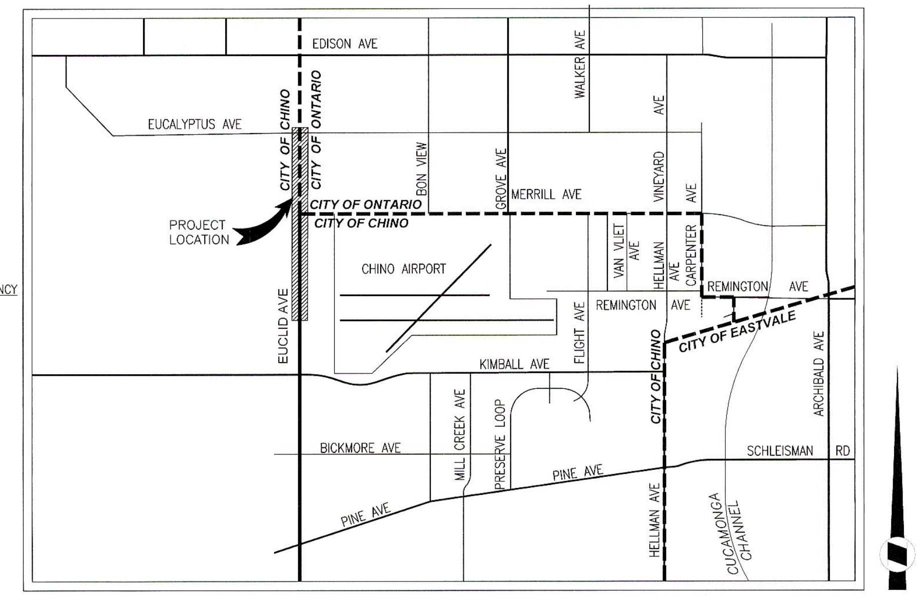
TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOTS 1, 2, 3, 16, 17, 18, 19, 20, 21, 34, 35 AND 36 IN SECTION 19, TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO MAP OF SUBDIVISION OF PART OF THE RANCHO SANTA ANA DEL CHINO, RECORDED IN BOOK 6, PAGE 15 OF MAPS, RECORDS OF SAID COUNTY.



VICINITY MAP

N.T.S.

INDEX OF DRAWINGS

INDEX NO.	DESCRIPTION
SHEET 1	TITLE SHEET
SHEET 2	SHEET INDEX AND TYPICAL SECTIONS
SHEET 3	EUCLID AVENUE – FROM MERRILL AVE TO 912' NORTH OF MERRILL AVE
SHEET 4	EUCLID AVENUE – FROM 912' TO 1812' NORTH OF MERRILL AVE
SHEET 5	EUCLID AVENUE – FROM 1812' NORTH OF MERRILL AVE TO EUCALYPTUS AVE
SHEET 6	EUCLID AVENUE – FROM 2171' TO 3071' NORTH OF KIMBALL AVE
SHEET 7	EUCLID AVENUE – FROM 3071' NORTH OF KIMBALL AVE TO 1310' SOUTH OF MERRILL AVE
SHEET 8	EUCLID AVENUE – FROM 1310' TO 590' SOUTH OF MERRILL AVE
SHEET 9	EUCLID AVENUE – FROM 590' SOUTH OF MERRILL AVE TO MERRILL AVE
SHEET 10	CDS & UTILITY CROSSING DETAILS
SHEET 11-21	DETAILS

OWNER/DEVELOPER:

REDA
4100 MACARTHUR, SUITE 120
NEWPORT BEACH, CA 92660

CONTACT: JEFF JOHNSTON
PHONE: (949) 945-6809
EMAIL: JJOHNSTON@REDALLC.COM

CIVIL ENGINEER

WESTLAND GROUP INC.
4150 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SIARA R. MACKINNEY, P.E.
PHONE: (909)-403-5647

GEOTECHNICAL ENGINEER:

SOUTHERN CALIFORNIA GEOTECHNICAL
22885 EAST SAVI RANCH PARKWAY, SUITE E
YORBA LINDA, CA 92887

CONTACT: GREGORY K. MITCHELL
PHONE: (714) 685-1115

REFERENCE DRAWINGS

DESCRIPTION	REFERENCE
PROPOSED 8" RECYCLED WATER AT EUCLID AVE	PM 20016 RECYCLED WATER IMPROVEMENT
PROPOSED 16" DOMESTIC WATER AT EUCLID AVE	PM 20016 DOMESTIC WATER IMPROVEMENT PLAN
PROPOSED 36" SEWER AT EUCLID AVE	M-1219 SEWER IMPROVEMENT PLANS
PROPOSED 20" SEWER AT EUCLID AVE	PM 20016 SEWER IMPROVEMENT PLAN

HYDROLOGY LEGEND

Q_{ULT-O} = PEAK FLOW RATE BASED ON THE CITY OF ONTARIO MPD
Q_{ULT-C} = PEAK FLOW RATE BASED ON THE CITY OF CHINO MASTER PLAN UPDATE.
NOTE:
THE CITY OF ONTARIO Q_{ULT-O}=2234.5 FT^3/S COMPARED TO THE CITY OF CHINO Q_{ULT-C}=2196.2 FT^3/S.

$Q_{INTERIM}$ = PEAK FLOW RATE BASED ON CURRENT LAND COVER.

NOTE:
THE CITY OF ONTARIO $Q_{INTERIM}$=900.1 FT^3/S COMPARED TO THE CITY OF CHINO $Q_{INTERIM}$=1142.7 FT^3/S.

H_{ULT-O} BASED ON CITY OF ONTARIO Q_{ULT}
H_{ULT-C} BASED ON CITY OF CHINO Q_{ULT}
$H_{INTERIM}$ BASED ON CITY OF CHINO $Q_{INTERIM}$= 1142.7 FT^3/S.

$V_{ULT-100}$ = FOUND USING $Q_{ULT-100}$.
$V_{INT-100}$ = FOUND USING $Q_{INT-100}$.

CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.
2. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY AND NOT BE LIMITED TO A NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER, OR ANY PUBLIC AGENCY.
3. THE ESTIMATES OF IMPROVEMENT QUANTITIES AS SHOWN HEREON ARE PROVIDED ONLY FOR THE PURPOSE OF SATISFYING DISTRICT PLAN INFORMATION REQUIREMENTS. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES AND SHALL USE SAME AS A BASIS FOR HIS BID(S) AND CONTRACT(S).
4. CONTRACTOR TO VERIFY CLEARANCE AT ALL UTILITY CROSSINGS. IF INTERFERENCE OCCURS, OTHER THAN NOTED ON PLAN, CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR POSSIBLE REDESIGN. IF REDESIGN IS NOT FEASIBLE, CONTRACTOR TO RELOCATE UTILITY AT NO EXPENSE TO ENGINEER.
5. CONTRACTOR SHALL TAKE EXTREME CARE DURING STORM DRAIN CONSTRUCTION AND IS RESPONSIBLE FOR TRENCHING AND SHORING. CONTRACTOR SHALL SUBMIT A DETAILED SHORING PLAN PER SECTION 7-10.4.2.2 OF SPPWC AND A PERMIT FROM STATE DIVISION OF INDUSTRIAL SAFETY PRIOR TO COMMENCING WORK.
6. CONTRACTOR SHALL VERIFY PAVEMENT ELEVATION AT RIM PRIOR TO SETTING CONE.

CONSTRUCTION NOTES

ITEM	DESCRIPTION	QUANTITY	
1	CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	2531	LF
2	CONSTRUCT 102" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	174	LF
3	CONSTRUCT 90" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	101	LF
4	CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20	5550	LF
5	CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20	5	EA
6	CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	38	LF
7	CONSTRUCT PRECAST DBL 10'x10' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 10'X10'- WITH SLOPED INVERT RCB PER CALTRANS STD. D81 & D82. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAILS ON SHEETS 13-18 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	600	LF
8	CONSTRUCT PRECAST 9.5'x9.5' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 9.5'X9.5' INCLUDE V INVERT RCB PER CALTRANS STD. D80. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAIL ON SHEETS 14, 15, 17 AND 19 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET 20	56	LF
9	CONSTRUCT TRANSITION STRUCTURE PIPE TO PIPE PER SPPWC STD. 340-2, DETAIL ON SHEET 14	1	EA
10	CONSTRUCT TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB PER SPPWC STD. 343-2, DETAIL ON SHEET 12	1	EA
11	CONSTRUCT 36" STORM DRAIN MANHOLE SHAFT WITHOUT REDUCER PER SPPWC STD. 326-2, DETAIL ON SHEET 11	5	EA
12	CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN	4	EA
13	CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.	4	EA
14	CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11	3	EA
15	CONSTRUCT RCB WINDOW PER SPPWC STD 382-2, DETAIL ON SHEET 21	1	EA
16	CONSTRUCT RCB STAND PIPE OUTLET RISER PER DETAIL16 ON SHEET 11	36	EA
17	CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	260	LF
18	INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11	4	EA
19	CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16	10	EA
20	CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11	4	EA
21	INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT	4	EA
22	CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15	6	EA
23	CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, DETAIL ON SHEET 13	1	EA
24	CONSTRUCT RIP-RAP PER SAN DIEGO REGIONAL STD. DWG. D-40 DETAIL ON SHEET 12	60	CY
25	CONSTRUCT ENDWALL PER DETAIL 25 ON SHEET 18	1	EA
26	CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19	9	EA
27	CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12	4	EA
28	CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17	10	EA
29	CONSTRUCT 24" TEMPORARY HDPE 45° BEND	4	EA
30	CONSTRUCT 12" RCP CONCRETE COLLAR PER SPPWC STD. 380-4, DETAIL ON SHEET 21	1	EA
31	CONSTRUCT CDS UNIT, SIZE PER PLAN PER DETAIL 31 ON SHEET 21	3	EA
32	CONSTRUCT 24" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	20	LF
33	INSTALL SURVEY MONITORING POINTS AND SETTLEMENT ROD PER CALTRANS TR-0151 AND TR-0152 ON SHEET 18	2	EA

LEGEND OF ABBREVIATIONS

BC	BEGIN CURVE	LT	LEFT
BCR	BEGIN CURB RETURN	LP	LOW POINT
BNDY	BOUNDARY	MIN	MINIMUM
C+G	CURB AND GUTTER	PCC	POINT OF COMPOUND CURVE
CB	CATCH BASIN	ℙ OR P/L OR PL	PROPERTY LINE
CFS	CUBIC FEET PER SECOND	PRC	POINT OF REVERSE CURVE
℄ OR C/L OR CL	CENTERLINE	PVC	POLYVINYL CHLORIDE
DBL	DOUBLE	RCB	REINFORCED CONCRETE BOX
DW	DOMESTIC WATER	RCP	REINFORCED CONCRETE PIPE
EC	END CURVE	RT	RIGHT
ECR	END CURB RETURN	RW	RECYCLED WATER
EP	EDGE OF PAVEMENT	R/W	RIGHT OF WAY
ESMT	EASEMENT	SD	STORM DRAIN
EX, EXIST.	EXISTING	SL	STREET LIGHT
FH	FIRE HYDRANT	SP	STAND PIPE (RCP)
FL	FLOW LINE	SS	SANITARY SEWER
FS	FINISHED SURFACE	SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
FT/S	FEET PER SECOND	STA	STATION
GB	GRADE BREAK	TC	TOP OF CURB
HDPE	HIGH DENSITY POLY ETHYLENE	TYP	TYPICAL
HP	HIGH POINT	ULT	ULTIMATE
INT	INTERIM		
INV	INVERT		

LEGEND OF SYMBOLS

(100) EXISTING CONTOURS
100 PROP. CONTOUR
EXIST. EASEMENT
2% FLOW RATE
CENTERLINE
FIRE HYDRANT
SIGN
PROPOSED STORM DRAIN MH
PROPOSED CATCH BASIN
PROPOSED STORM DRAIN
BOUNDARY LINE
FENCE LINE
STREET LIGHT

RECOMMENDED FOR ACCEPTANCE
TECK, C. LOH, P.E. 7/13/2022
HARRIS AND ASSOCIATES DATE

CITY OF CHINO
RECOMMENDED BY: 8/8/2022
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK
DATE: 04/26/2022
DRAWN BY: PK/BK
DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

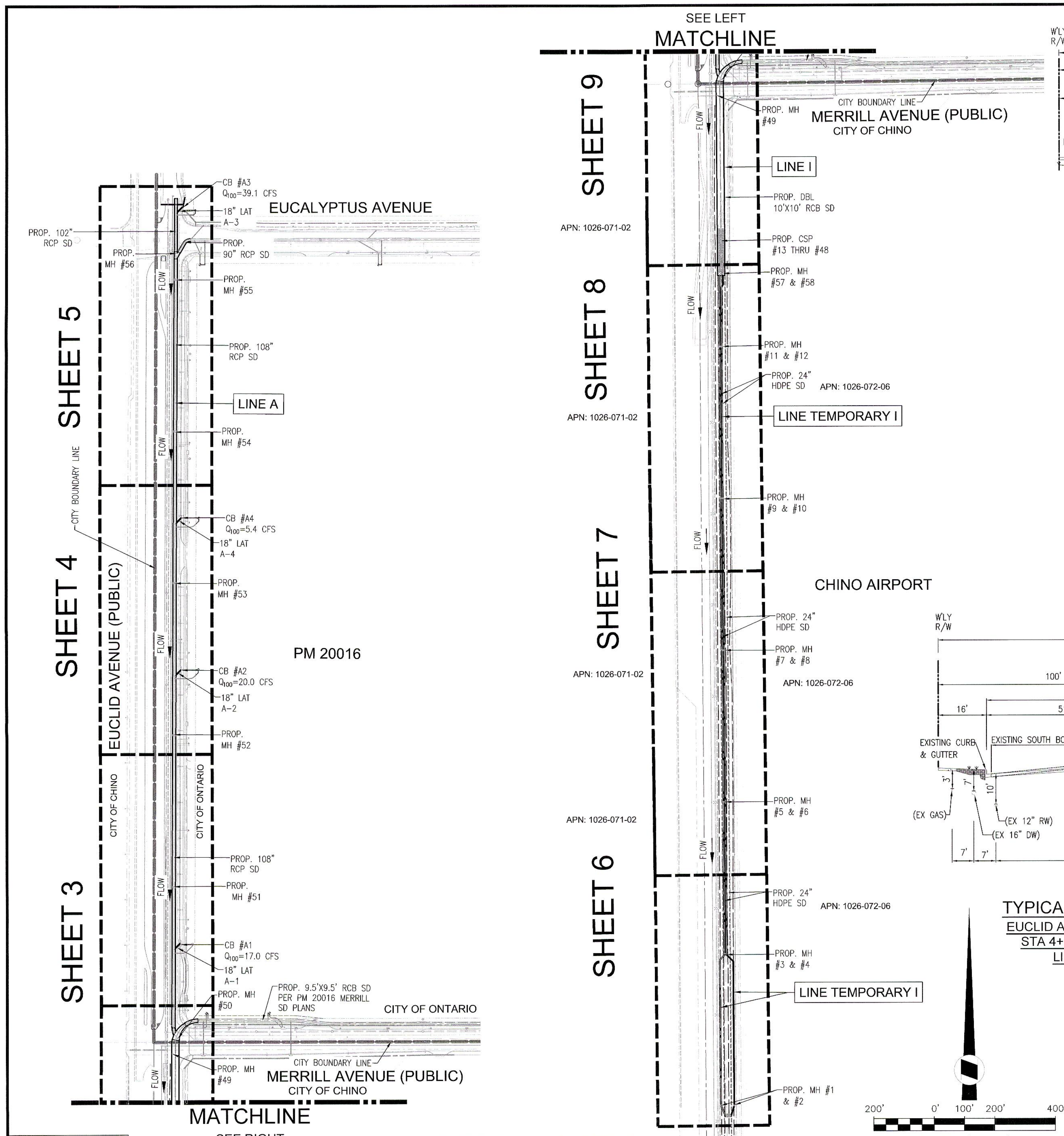
STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
TITLE SHEET

PM-20016

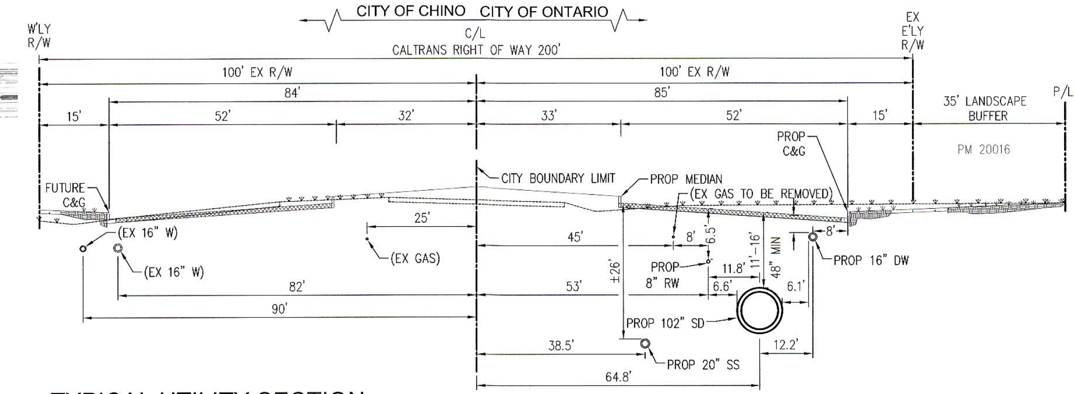
SHEET 1 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14485 AA 5949SD

06/16/2022

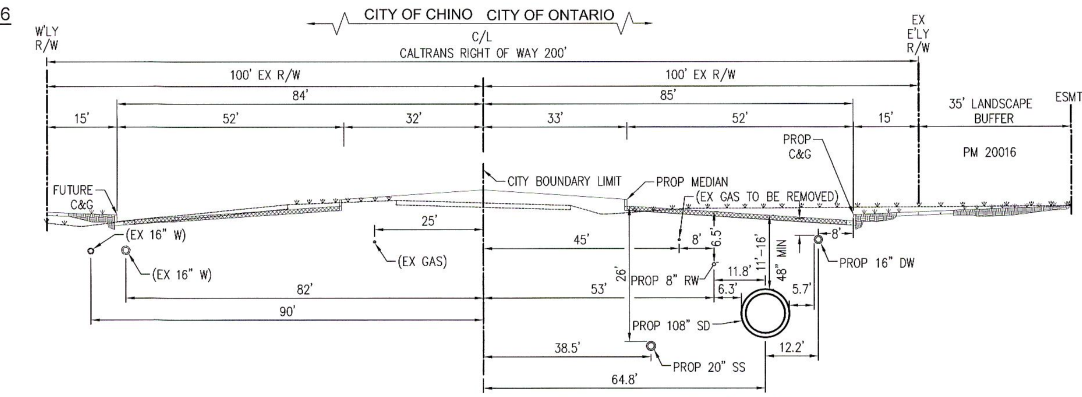
Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\01_2020-015_SD.dwg
Last Opened: Jun 16, 2022 - 3:14pm by: Brent.King



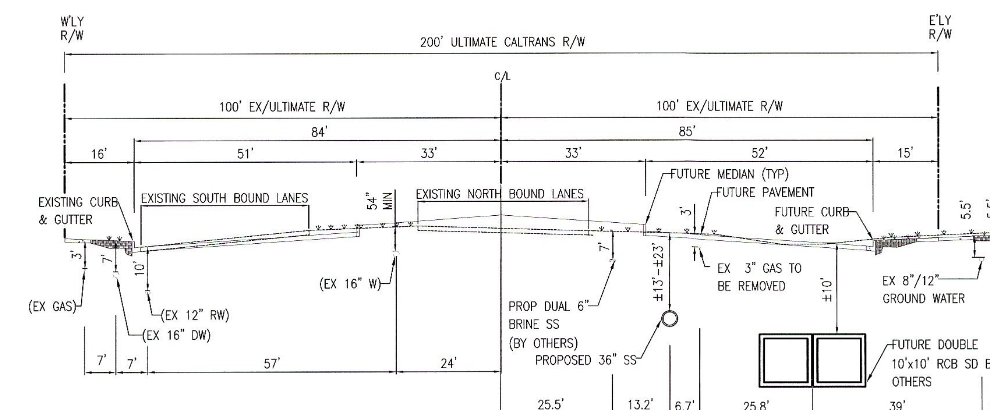
SHEET INDEX/SYSTEM MAP



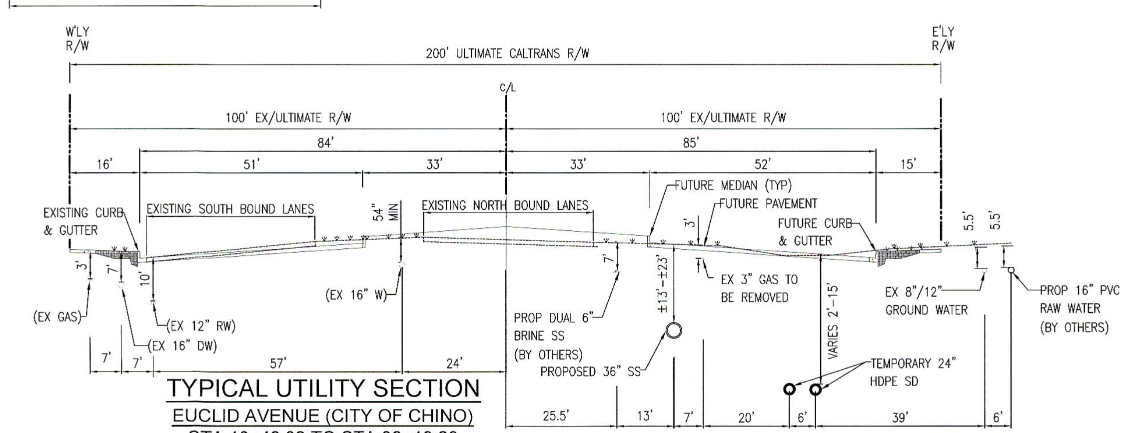
TYPICAL UTILITY SECTION
EUCLID AVENUE
STA 35+87.99 TO STA 37+62.56
LINE A STATIONING
N.T.S.



TYPICAL UTILITY SECTION
EUCLID AVENUE
STA 10+33.24 TO STA 35+64.75
LINE A STATIONING
N.T.S.



TYPICAL UTILITY SECTION
EUCLID AVENUE (CITY OF CHINO)
STA 4+04.72 TO STA 10+03.77
LINE I STATIONING
N.T.S.



TYPICAL UTILITY SECTION
EUCLID AVENUE (CITY OF CHINO)
STA 10+46.32 TO STA 38+19.29
LINE TEMPORARY I STATIONING
N.T.S.

811 Know what's below. Call 811 before you dig.

CALTRANS # 08-22-6-UT-0007

CITY OF CHINO

RECOMMENDED BY: 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/18/22 DATE
ACCEPTED BY: KHOI DO, P.E. CITY ENGINEER 7/18/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

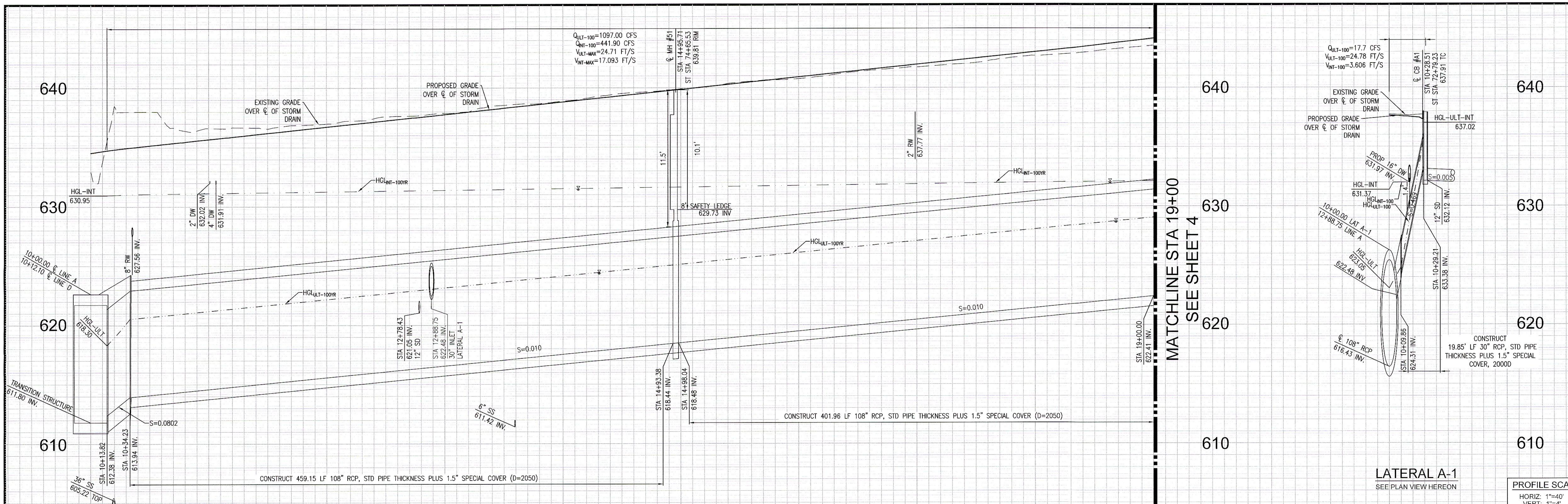
STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
SHEET INDEX AND TYPICAL SECTIONS

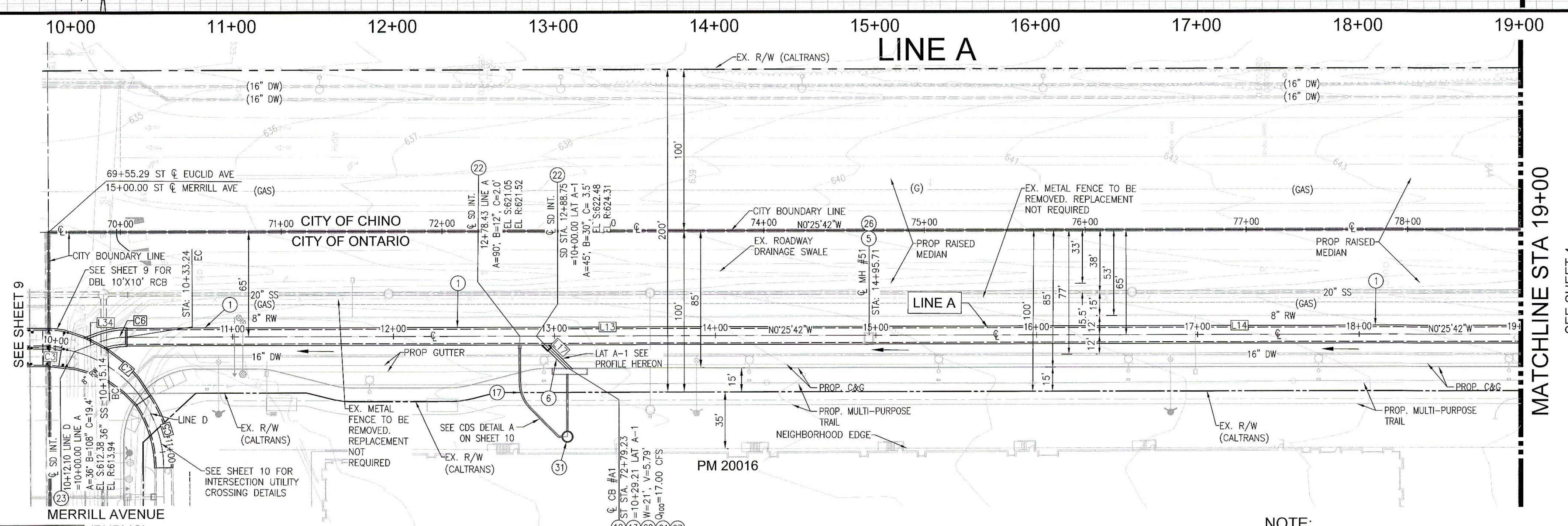
PM-20016

SHEET 2 OF 21
CONTRACT
ACCOUNT
DWG. NO. D1486
AA 5949 SD

06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\02_2020-015_SD-USM.dwg
Last Opened: Jun 03, 2022 - 3:48pm by: Brent.King





CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
5. CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20
6. CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
12. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
17. CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
20. CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22. CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
23. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, DETAIL ON SHEET 13
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
27. CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12
31. CONSTRUCT CDS UNIT, SIZE PER PLAN PER DETAIL 31 ON SHEET 21

EUCLID AVENUE (SR83)
(PUBLIC)

NOTE:
- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
C5	033°39'48.2"	44.07'	75.00'	22.69
C6	020°49'26.7"	16.36'	45.00'	8.27
C7	047°22'56.9"	62.02'	75.00'	32.91
L13	N0°25'42"W	460.14'		
L14	N0°25'42"W	495.34'		
L17	N44°34'18"E	17.93'		

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

LEGEND
STORM DRAIN FLOW DIRECTION

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

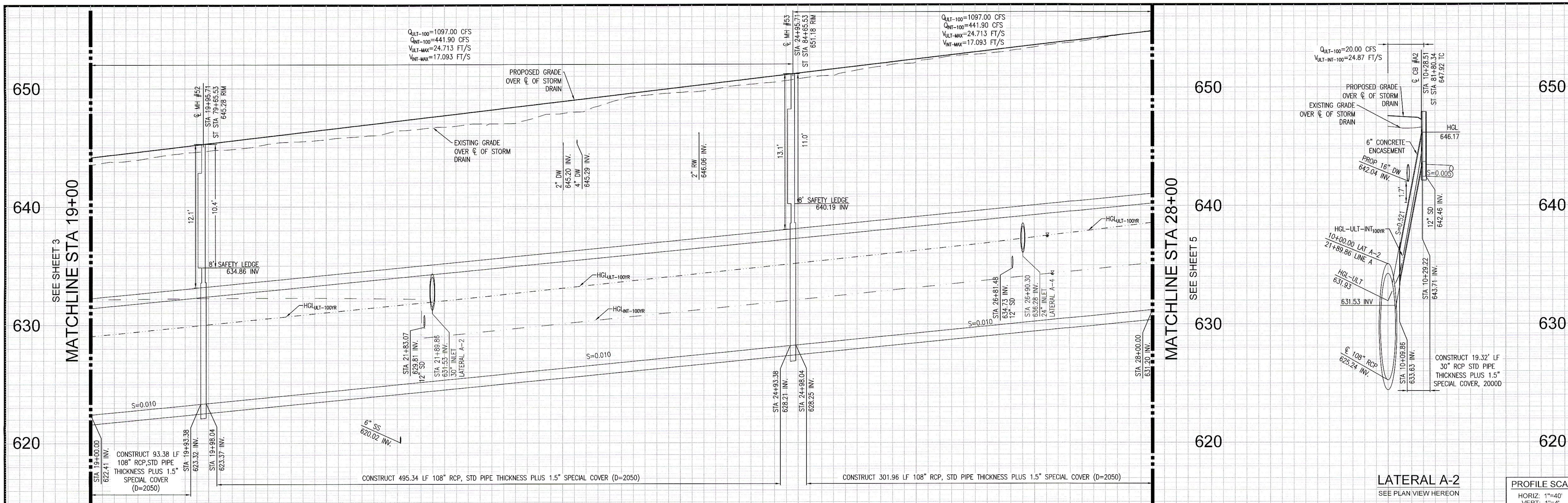
WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN & PROFILE
EUCLID AVENUE
FROM MERRILL AVE TO 912' NORTH OF MERRILL AVE

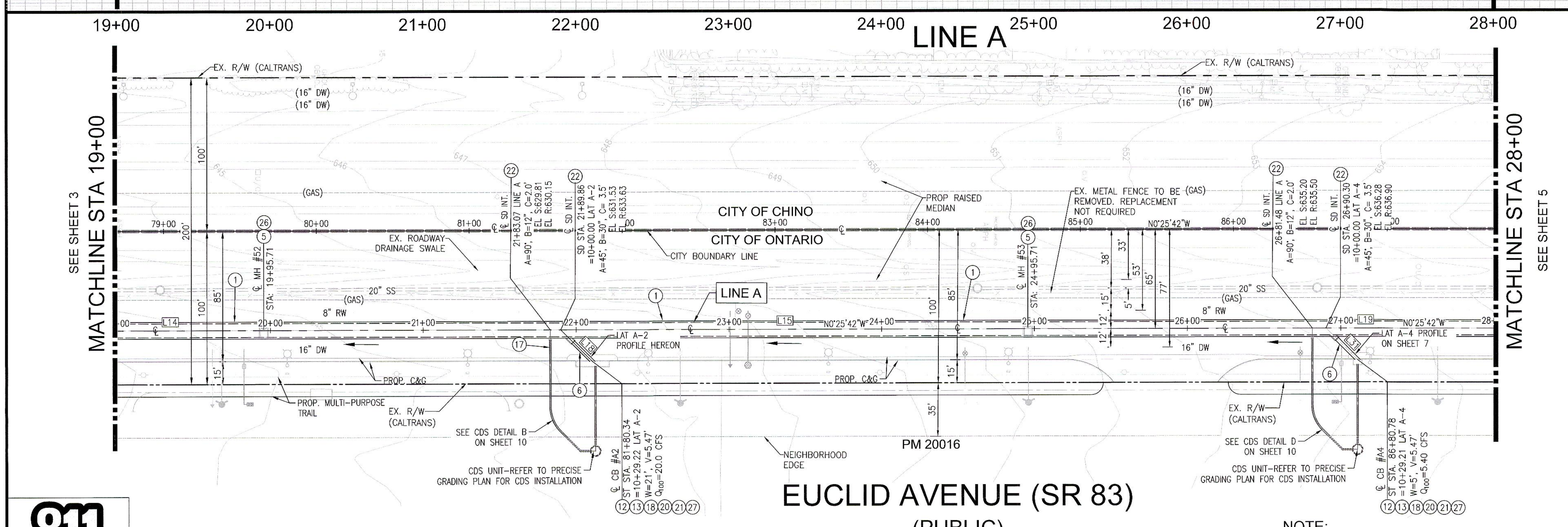
PM-20016

SHEET 3 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14487
AA 5949SD

06/16/2022



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



CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
5. CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20
6. CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
12. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
17. CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
18. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11
20. CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22. CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
27. CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L14	N0°25'42"W	495.34'		
L15	N0°25'42"W	495.34'		
L18	N44°33'24"E	17.94'		
L19	N0°25'42"W	495.34'		
L31	N44°33'51"E	19.37'		

NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

← STORM DRAIN FLOW DIRECTION

40' 0' 20' 40' 80'
SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

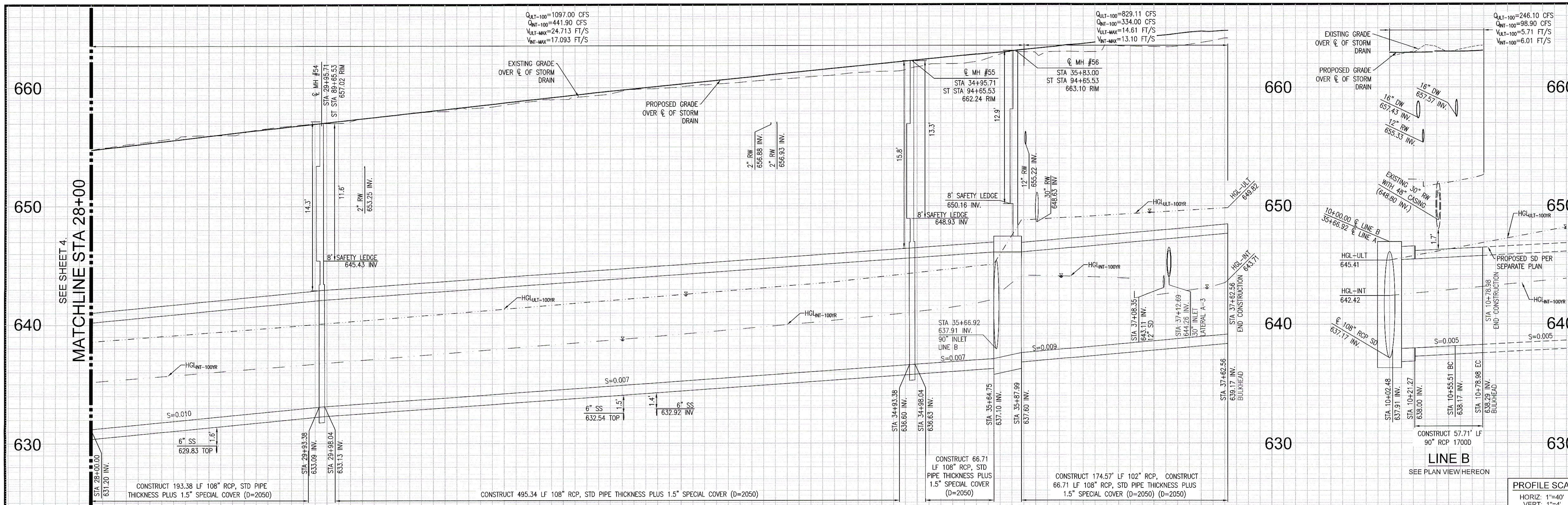
STORM DRAIN IMPROVEMENT PLAN & PROFILE
EUCLID AVENUE
FROM 912' TO 1812' NORTH OF MERRILL AVE

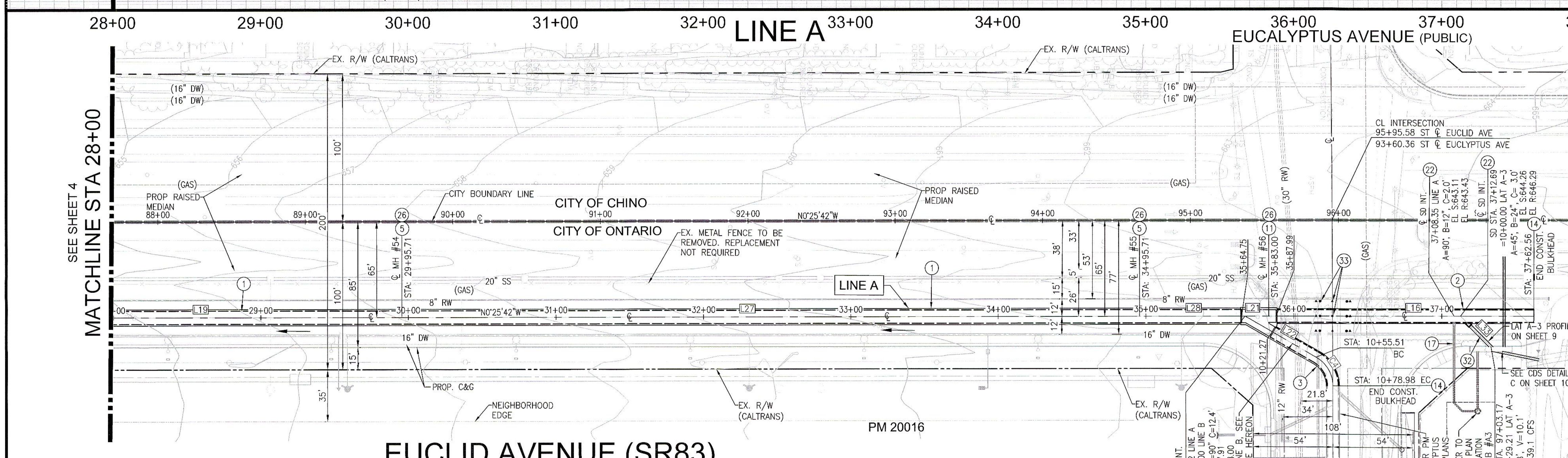
PM-20016

SHEET 4 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14488
AA 5949 SD

06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\04_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 2:55pm by: Brent.King





PM 20016

EUCLID AVENUE (SR83)

(PUBLIC)

EUCALYPTUS AVENUE (PUBLIC)

CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
2. CONSTRUCT 102" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
3. CONSTRUCT 90" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
5. CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20
9. CONSTRUCT TRANSITION STRUCTURE PIPE TO PIPE PER SPPWC STD. 340-2, DETAIL ON SHEET 14
11. CONSTRUCT 36" STORM DRAIN MANHOLE SHAFT WITHOUT REDUCER PER SPPWC STD. 326-2, DETAIL ON SHEET 11
12. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
14. CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
17. CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
18. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11
20. CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22. CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
27. CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12
32. CONSTRUCT 24" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
33. INSTALL SURVEY MONITORING POINTS AND SETTLEMENT ROD PER CALTRANS TR-0151 AND TR-0152 ON SHEET 18

811 Know what's below. Call 811 before you dig.

NOTE:
- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
C4	059°45'58.3"	23.47'	22.50'	12.93
L16	N0°25'42"W	174.57'		
L19	N0°25'42"W	495.34'		
L21	N0°25'42"W	28.79'		

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L22	N29°32'41"E	55.51'		
L27	N0°25'42"W	495.34'		
L28	N0°25'42"W	66.72'		
L33	N44°34'18"E	20.20'		

LEGEND

STORM DRAIN FLOW DIRECTION

SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

REVISIONS

MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. R.C.E. NO. 85559 DATE 6/22/22

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE

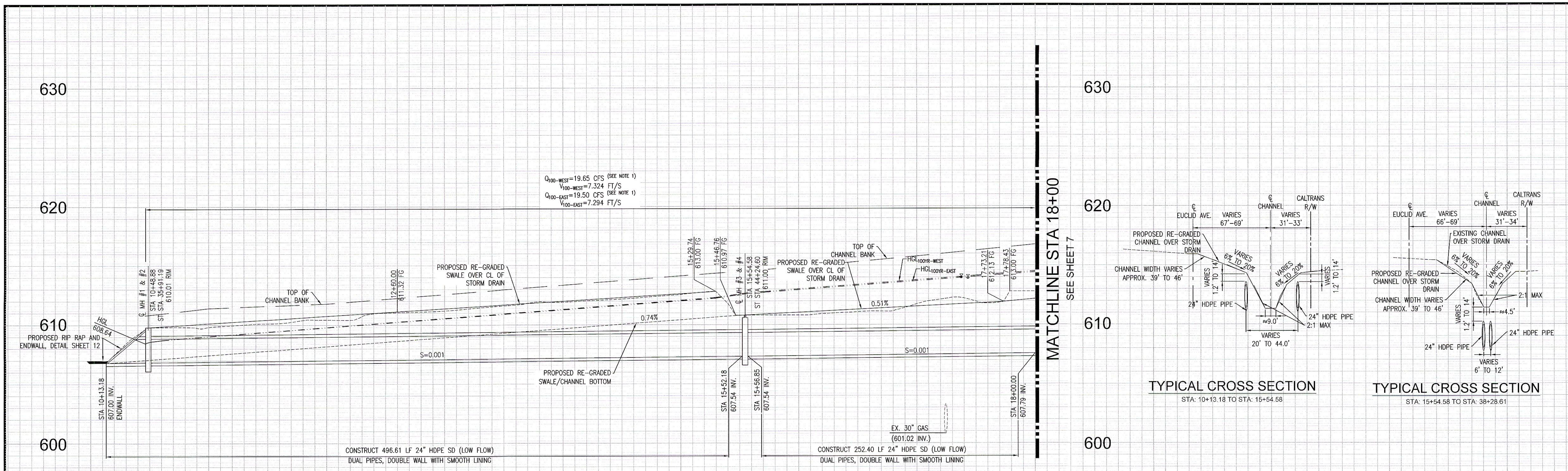
FROM 1812' NORTH OF MERRILL AVE TO EUCALYPTUS AVE

PM-20016

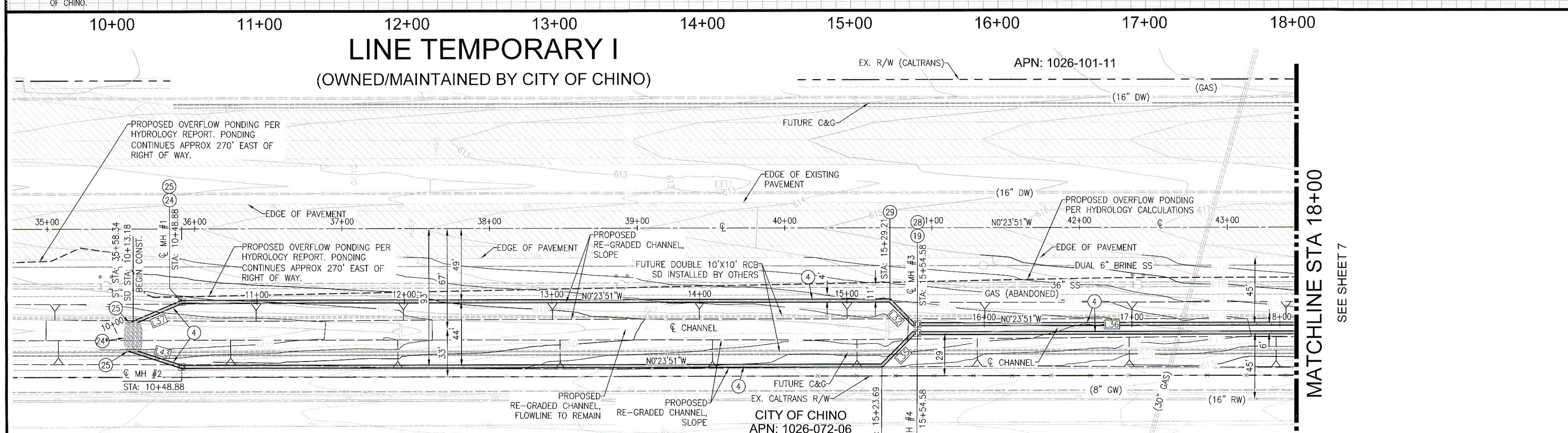
SHEET 5 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14489
AA 5949 SD

06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\05_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 3:03pm by: Brent.King



NOTE 1: THE 39 CFS IS BASED ON THE MAXIMUM FLOW RATE THAT CAN BE CONVEYED BY THE DOUBLE 24-INCH STORM DRAIN SYSTEM. THE 39 CFS IN AN INTERIM CONDITION UNTIL SUCH TIME ULTIMATE LINE "I" IS CONSTRUCTED WITHIN THE CITY OF CHINO.



CONSTRUCTION NOTES

(4) CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20

(19) CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16

(24) CONSTRUCT RIP-RAP PER SAN DIEGO REGIONAL STD. DWG. D-40 DETAIL ON SHEET 12

(25) CONSTRUCT ENDWALL PER DETAIL 25 ON SHEET 18

(28) CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L32	S45°02'17"W	22.61'		
L35	S45°50'14"E	30.52'		
L36	N0°23'51"W	495.89'		
L37	S23°25'44"E	35.70'		
L43	N17°41'12"E	29.81'		

SEAL

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

Liesi R Makz 6/22/22

811 Know what's below. Call 811 before you dig.

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

PAVEMENT LEGEND

EXISTING AC PAVEMENT TO REMAIN

* PROPOSED RIP RAP SHALL BE $\frac{1}{4}$ TON ROCK WITH FOLLOWING GRADATION
$\frac{1}{2}$ TON – 0 TO 5% PASSING
200 LB – 50 TO 100% PASSING
75 LB – 90 TO 100% PASSING

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

STORM DRAIN FLOW DIRECTION

40' 0' 20' 40' 80'
SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

PREPARED BY	REVISIONS	MADE BY	MADE DATE	RECOMMENDED BY	RECOMMENDED DATE	BENCH MARK DATA	REFERENCE DRAWINGS
FIRM: WESTLAND GROUP, INC.						BENCH MARK No. GG-18-1	
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764						ELEV. 635.314' (NAVD '88) LEVELED 2018	
						LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.	
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660							
SIGNATURE RCE 85559 DATE							

REVIEWED BY STAFF	BY	DATE
WATER:		
SEWER:		
FIRE:		
PLANNING:		
TRAFFIC:		
ENVIRONMENTAL:		

CITY ENGINEER'S STAFF	BY	DATE
DRAWN:		
DESIGNED:		
CHECKED:		
RECOMMENDED:		

RECOMMENDED BY:
CITY ENGINEER
DATE: 8/8/22

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE
FROM 2171' TO 3071' NORTH OF KIMBALL AVE

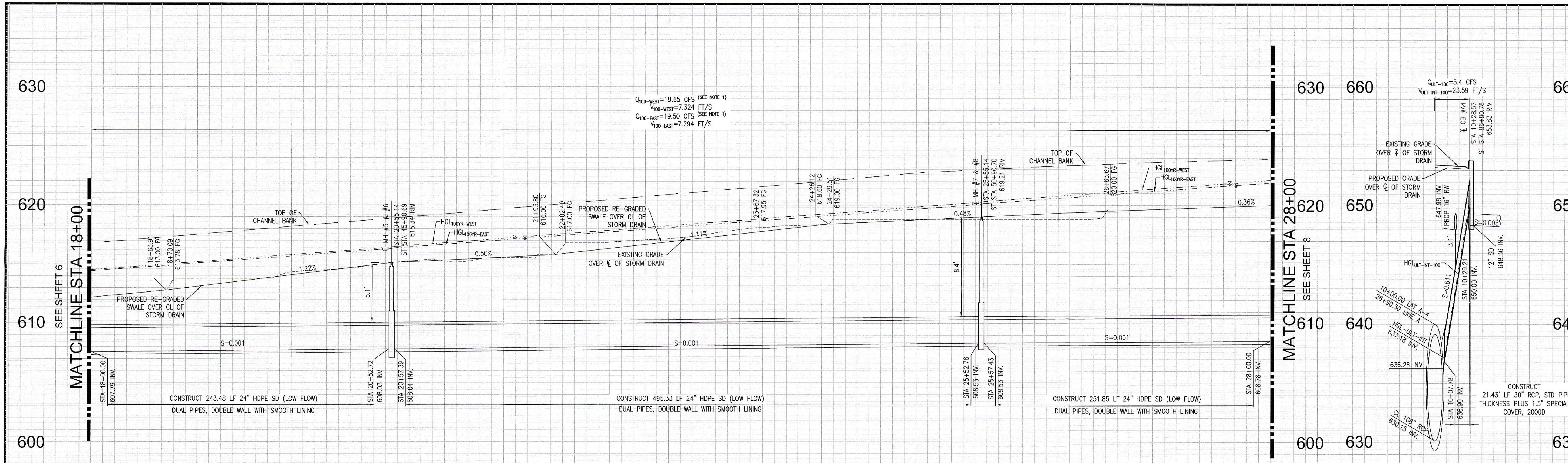
PROJECT NO. PM-20016

SHEET 6 OF 21

DRAWING NO. AA 5949 SD D14490

06/08/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 08, 2022 - 5:22pm by: Brent.King



NOTE 1: THE 39 CFS IS BASED ON THE MAXIMUM FLOW RATE THAT CAN BE CONVEYED BY THE DOUBLE 24-INCH STORM DRAIN SYSTEM. THE 39 CFS IN AN INTERIM CONDITION UNTIL SUCH TIME ULTIMATE LINE "I" IS CONSTRUCTED WITHIN THE CITY OF CHINO.

LATERAL A-4

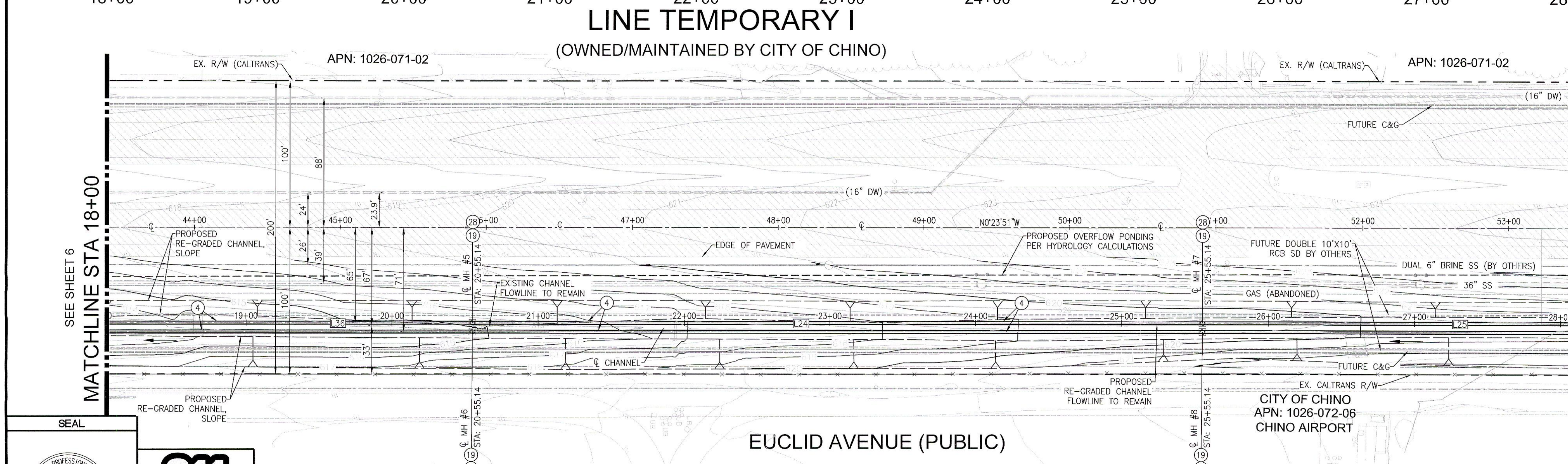
SEE PLAN VIEW SHEET 4

PROFILE SCALE

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

LINE TEMPORARY I

(OWNED/MAINTAINED BY CITY OF CHINO)



CONSTRUCTION NOTES

(4) CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20

(19) CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16

(28) CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L24	N0°23'51"W	495.34'		
L25	N0°23'51"W	495.33'		
L36	N0°23'51"W	495.89'		

SEAL

No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

6/22/22

Know what's below. Call 811 before you dig.

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

PAVEMENT LEGEND

EXISTING AC PAVEMENT TO REMAIN

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

STORM DRAIN FLOW DIRECTION

SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

PREPARED BY	REVISIONS	MADE BY	MADE DATE	RECOMMENDED BY	RECOMMENDED DATE	BENCH MARK DATA
FIRM: WESTLAND GROUP, INC.						BENCH MARK No. GG-18-1
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764						ELEV. 635.314' (NAVD '88) LEVELED 2018
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660						LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.
SIGNATURE RCE 85559 DATE						

REFERENCE DRAWINGS	REVIEWED BY STAFF	BY	DATE	CITY ENGINEER'S STAFF	BY	DATE
	WATER:			DRAWN:		
	SEWER:			DESIGNED:		
	FIRE:			CHECKED:		
	PLANNING:			RECOMMENDED:		
	TRAFFIC:					
	ENVIRONMENTAL:					

RECOMMENDED BY:

CITY ENGINEER

DATE: 8/8/22

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE

FROM 3071' NORTH OF KIMBALL AVE TO 1310' SOUTH OF MERRILL AVE

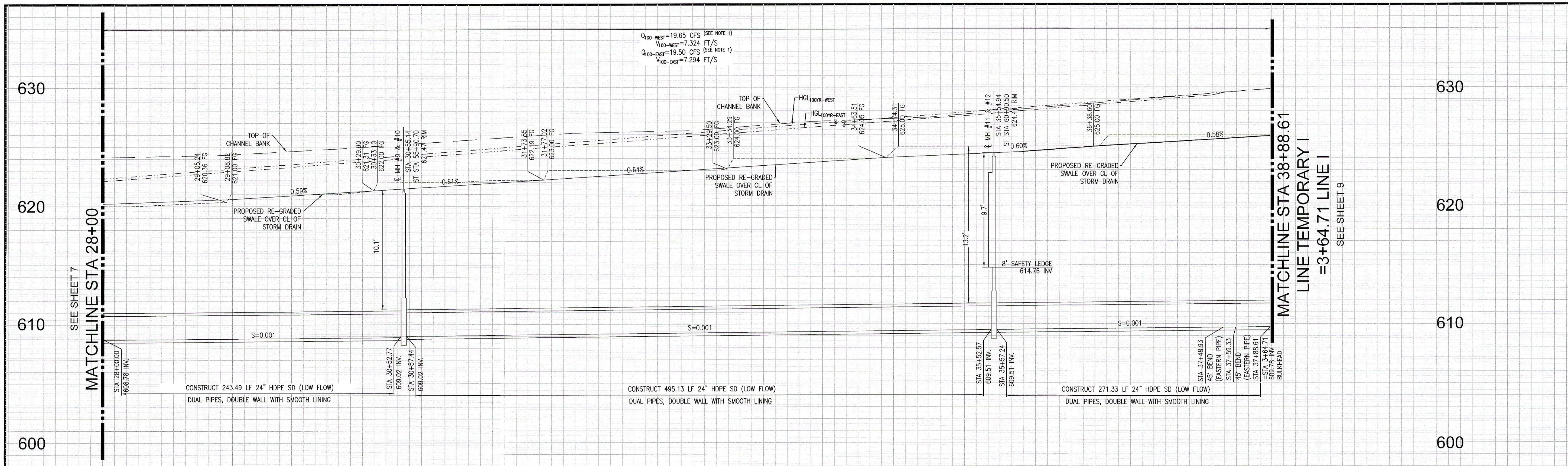
PROJECT NO. PM-20016

SHEET 7 OF 21

DRAWING NO. AA 5949 SD D1449

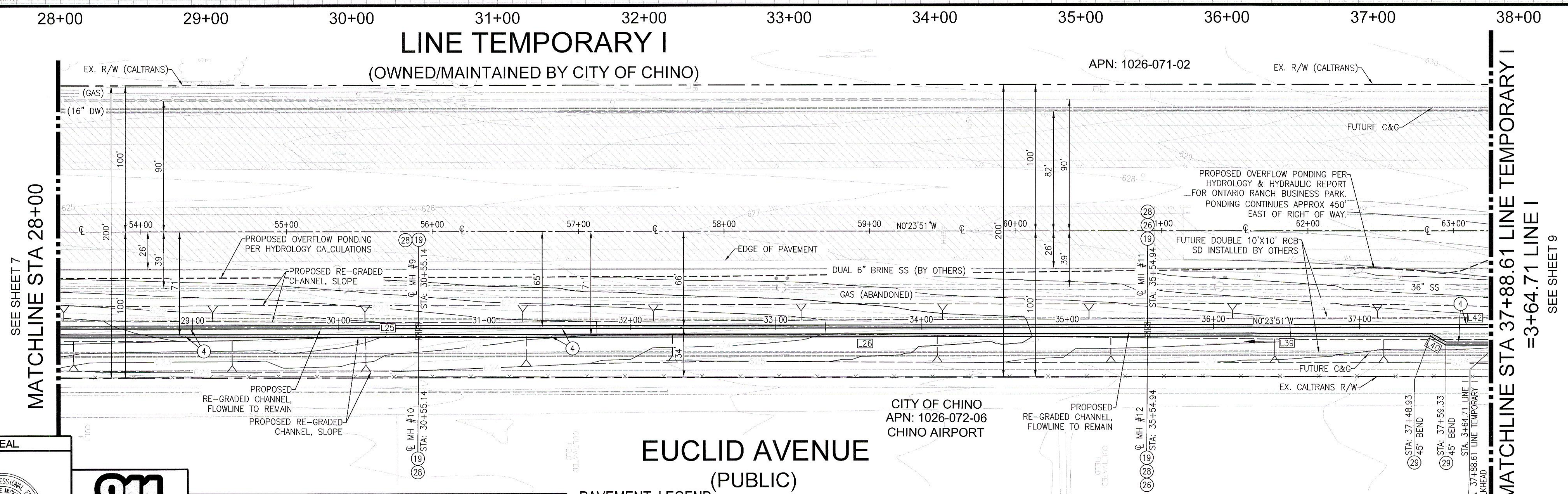
06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 9:03am by: Brent.King



NOTE 1: THE 39 CFS IS BASED ON THE MAXIMUM FLOW RATE THAT CAN BE CONVEYED BY THE DOUBLE 24-INCH STORM DRAIN SYSTEM. THE 39 CFS IN AN INTERIM CONDITION UNTIL SUCH TIME ULTIMATE LINE "I" IS CONSTRUCTED WITHIN THE CITY OF CHINO.

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



CONSTRUCTION NOTES

- (4) CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20
- (14) CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
- (19) CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16
- (26) CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
- (28) CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17
- (29) CONSTRUCT 24" TEMPORARY HDPE 45° BEND

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L25	N0°23'51"W	495.33'		
L26	N0°23'51"W	495.13'		
L39	N0°23'51"W	191.66'		
L40	N29°36'09"E	12.00'		
L41	N0°23'51"W	69.28'		
L42	N0°23'51"W	271.33'		

SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

LEGEND

STORM DRAIN FLOW DIRECTION

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

PAVEMENT LEGEND

PROPOSED AC PAVEMENT PER SEP. PLAN

EXISTING AC PAVEMENT TO REMAIN

SEAL

REGISTERED PROFESSIONAL ENGINEER
No.85559
Exp. 9/30/2022
CIVIL
STATE OF CALIFORNIA
6/22/22

Know what's below. Call 811 before you dig.

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — FOR — 7/28/22 DATE

PREPARED BY
FIRM: WESTLAND GROUP, INC.
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE RCE 85559 DATE

REVISIONS | MADE BY DATE | RECOMMENDED BY DATE

BENCH MARK DATA
BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REFERENCE DRAWINGS

REVIEWED BY STAFF	BY	DATE
WATER:		
SEWER:		
FIRE:		
PLANNING:		
TRAFFIC:		
ENVIRONMENTAL:		

CITY ENGINEER'S STAFF	BY	DATE
DRAWN:		
DESIGNED:		
CHECKED:		
RECOMMENDED:		

RECOMMENDED BY:
CITY ENGINEER
DATE: 8/8/22

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE

FROM 1310' TO 590' SOUTH OF MERRILL AVE

PROJECT NO. PM-20016

SHEET 8 OF 21

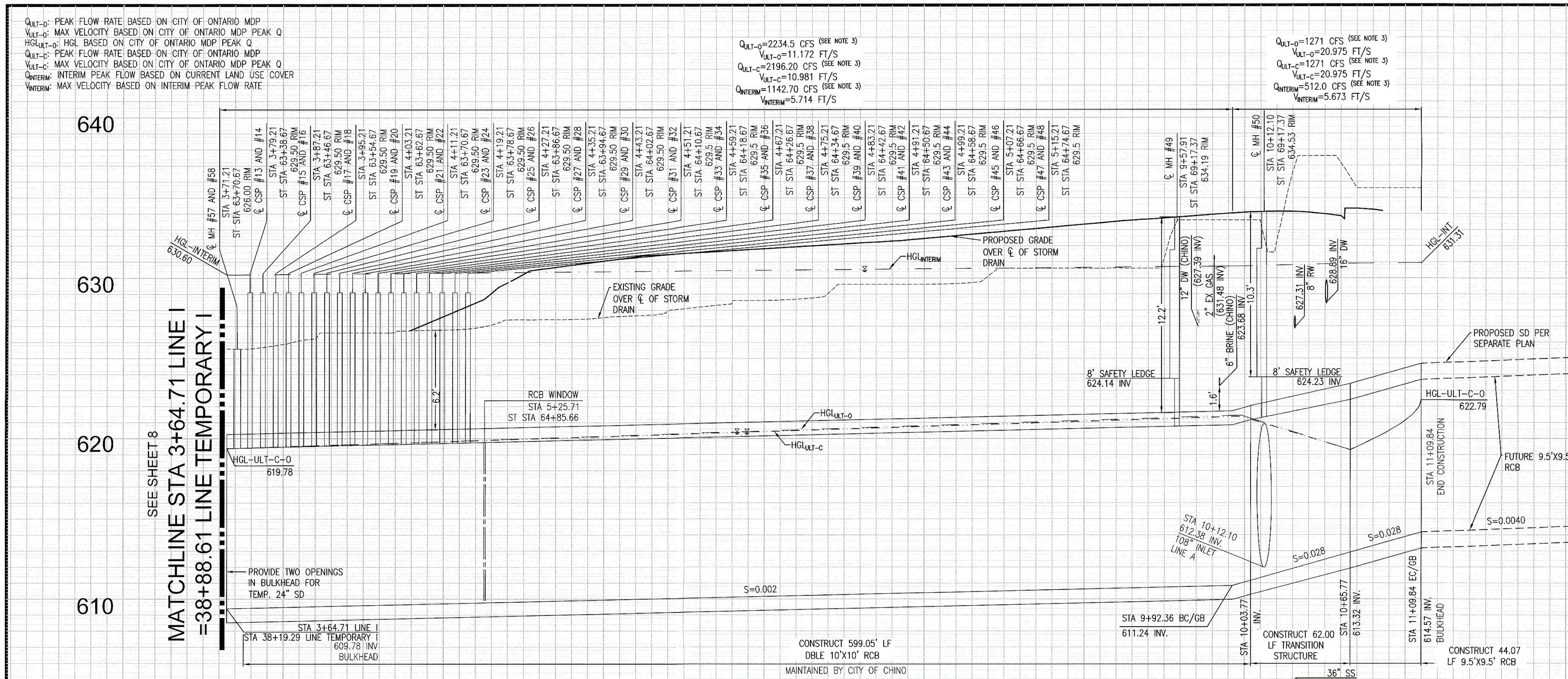
DRAWING NO. AA 5949 SD D14492

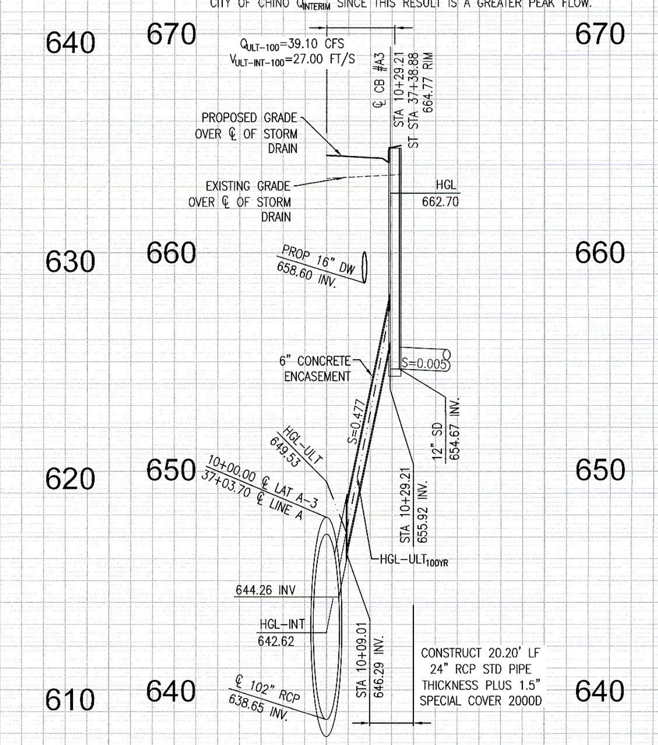
06/16/2022

Q_{ULT-O}: PEAK FLOW RATE BASED ON CITY OF ONTARIO MDP
V_{ULT-O}: MAX VELOCITY BASED ON CITY OF ONTARIO MDP PEAK Q
HGL_{ULT-O}: HGL BASED ON CITY OF ONTARIO MDP PEAK Q
Q_{ULT-C}: PEAK FLOW RATE BASED ON CITY OF ONTARIO MDP
V_{ULT-C}: MAX VELOCITY BASED ON CITY OF ONTARIO MDP PEAK Q
$Q_{INTERIM}$: INTERIM PEAK FLOW BASED ON CURRENT LAND USE COVER
$V_{INTERIM}$: MAX VELOCITY BASED ON INTERIM PEAK FLOW RATE

NOTE 2: THE PEAK FLOW RATE FOR LINE "I" BASED ON THE CITY OF ONTARIO MDP IS Q_{ULT-O}=2,234.5 CFS. THE PEAK FLOW RATE FOR LINE "I" BASED ON THE CITY OF CHINO MDP IS Q_{ULT-C}=2,196.2 CFS. THE HGL SHOWN ON THE PLANS PERTAIN TO THE PEAK FLOW RATES PROVIDED BY THE CITY OF ONTARIO AND CITY OF CHINO.

NOTE 3: $Q_{INTERIM}$ IS BASED ON PEAK FLOW RATE USING CURRENT LAND COVER USING AN AERIAL IMAGE DATED 8/2021. THE CITY OF ONTARIO $Q_{INTERIM}$=900.1 CFS. THE CITY OF CHINO $Q_{INTERIM}$=1,142.7. THE $HGL_{INTERIM}$ SHOWN ON THE PLANS IS BASED ON THE CITY OF CHINO $Q_{INTERIM}$ SINCE THIS RESULT IS A GREATER PEAK FLOW.





LATERAL A-3

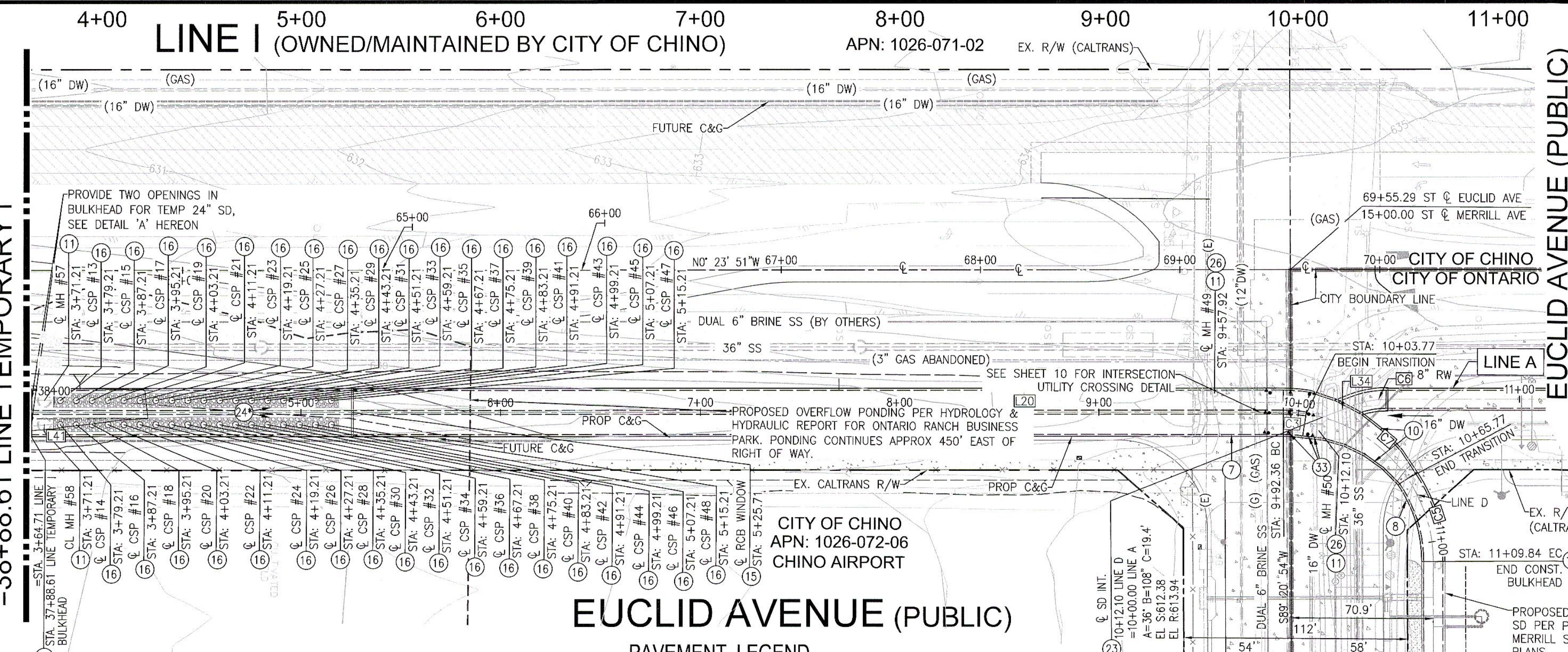
SEE PLAN VIEW SHEET 5

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

* PROPOSED RIP RAP SHALL BE NO. 2 BACKING ROCK WITH FOLLOWING GRADATION
75 LB – 0 TO 5% PASSING
25 LB – 25 TO 75% PASSING
5 LB – 90 TO 100% PASSING

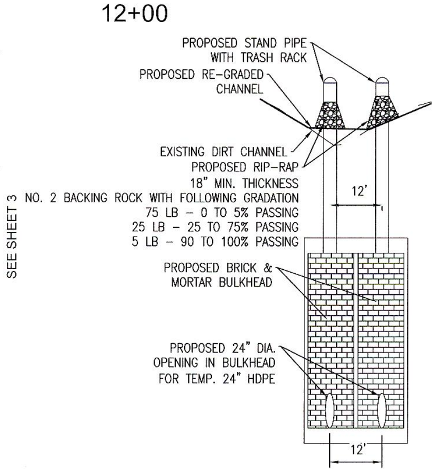
LINE I (OWNED/MAINTAINED BY CITY OF CHINO)

APN: 1026-071-02



EUCLID AVENUE (PUBLIC)

MERRILL AVENUE (PUBLIC)



DETAIL 'A'

SEE PLAN VIEW HEREON

CONSTRUCTION NOTES

7. CONSTRUCT PRECAST DBL 10'x10' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 10'X10'– WITH SLOPED INVERT RCB PER CALTRANS STD. D81 & D82. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAILS ON SHEETS 13–18 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET 20
8. CONSTRUCT PRECAST 9.5'x9.5' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 9.5'X9.5' INCLUDE V INVERT RCB PER CALTRANS STD. D80. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAILS ON SHEETS 14, 15, 17 AND 19 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET 20
10. CONSTRUCT TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB PER SPPWC STD. 343-2, DETAIL ON SHEET 12
11. CONSTRUCT 36" STORM DRAIN MANHOLE SHAFT WITHOUT REDUCER PER SPPWC STD. 326-2, DETAIL ON SHEET 11
14. CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
15. CONSTRUCT RCB WINDOW PER SPPWC STD 382-2, DETAIL ON SHEET 21
16. CONSTRUCT RCB STAND PIPE OUTLET RISER PER DETAIL16 ON SHEET 11
23. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, DETAIL ON SHEET 13
24. CONSTRUCT RIP-RAP PER SAN DIEGO REGIONAL STD. DWG. D-40 DETAIL ON SHEET 12
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
33. INSTALL SURVEY MONITORING POINTS AND SETTLEMENT ROD PER CALTRANS TR-0151 AND TR-0152 ON SHEET 18

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
C3	008°43'08.0"	11.41'	75.00'	5.72
C5	033°39'48.2"	44.07'	75.00'	22.69
C6	020°49'26.7"	16.36'	45.00'	8.27
C7	047°22'56.9"	62.02'	75.00'	32.91
L20	N0°23'51"W	492.37'		
L34	N21°15'08"W	16.88'		

SCALE: 1" = 40'

PAVEMENT LEGEND

PROPOSED AC PAVEMENT PER SEP. PLAN
PROPOSED PCC PAVEMENT PER SEP. PLAN
EXISTING AC PAVEMENT TO REMAIN

LEGEND

STORM DRAIN FLOW DIRECTION

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

CALTRANS # 08-22-6-UT-0007

811 Know what's below. Call 811 before you dig.

SEAL

REGISTERED PROFESSIONAL ENGINEER No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

6/22/22

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

PREPARED BY	REVISIONS	MADE BY	DATE	RECOMMENDED BY	DATE	BENCH MARK DATA	REFERENCE DRAWINGS	REVIEWED BY STAFF	BY	DATE	CITY ENGINEER'S STAFF	BY	DATE	RECOMMENDED BY:
FIRM: WESTLAND GROUP, INC.						BENCH MARK No. GG-18-1		WATER:			DRAWN:			
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764						ELEV. 635.314' (NAVD '88) LEVELED 2018		SEWER:			DESIGNED:			
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660						LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.		FIRE:			CHECKED:			CITY ENGINEER
SIGNATURE RCE 85559 DATE								PLANNING:			RECOMMENDED:			DATE: 8/8/22
								TRAFFIC:						
								ENVIRONMENTAL:						

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE

FROM 590' SOUTH OF MERRILL AVE TO MERRILL AVE

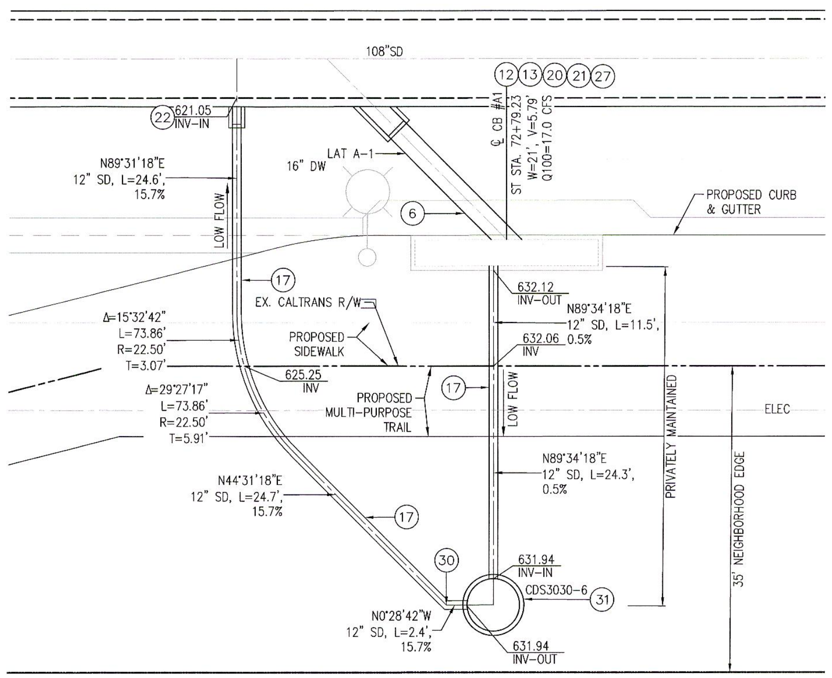
PROJECT NO. PM-20016

SHEET 9 OF 21

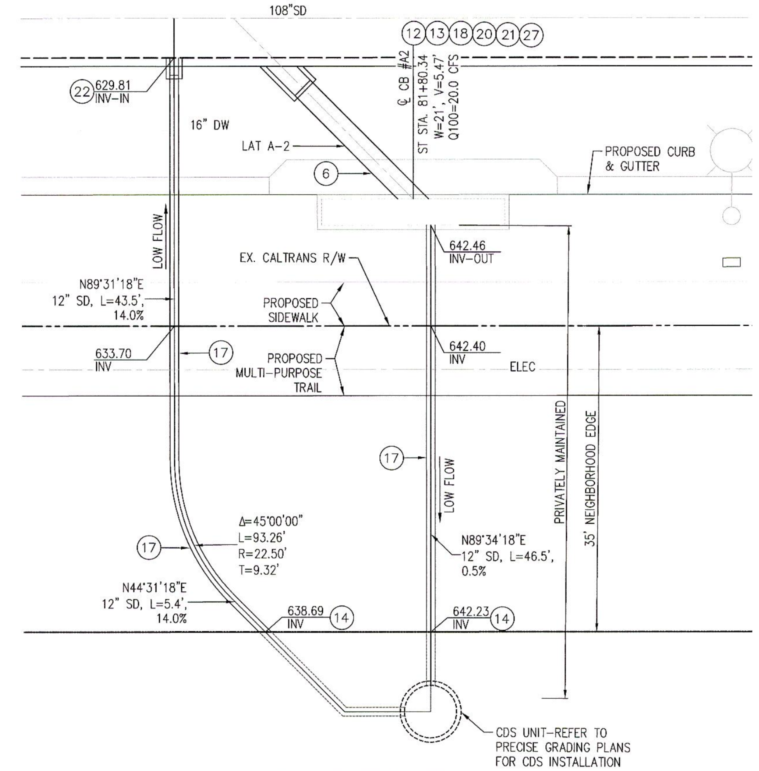
DRAWING NO. AA 5949 SD D14493

06/16/2022

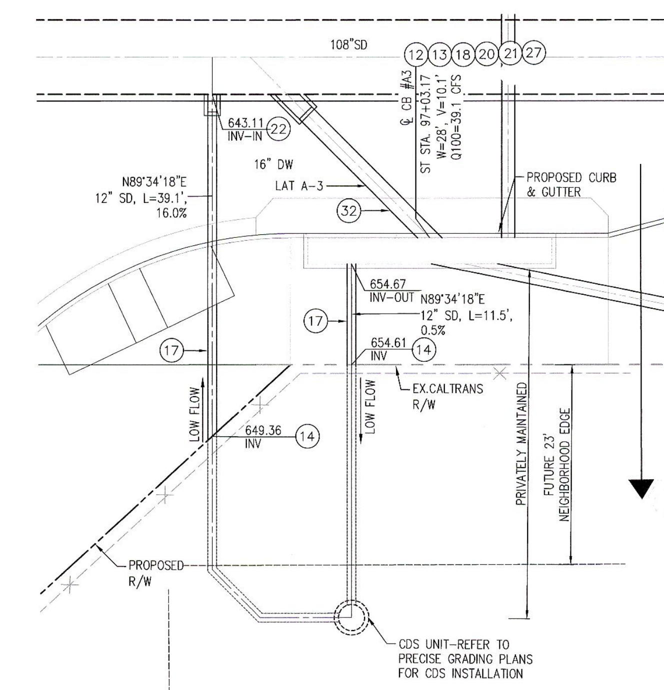
Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 – 3:11pm by: Brent.King



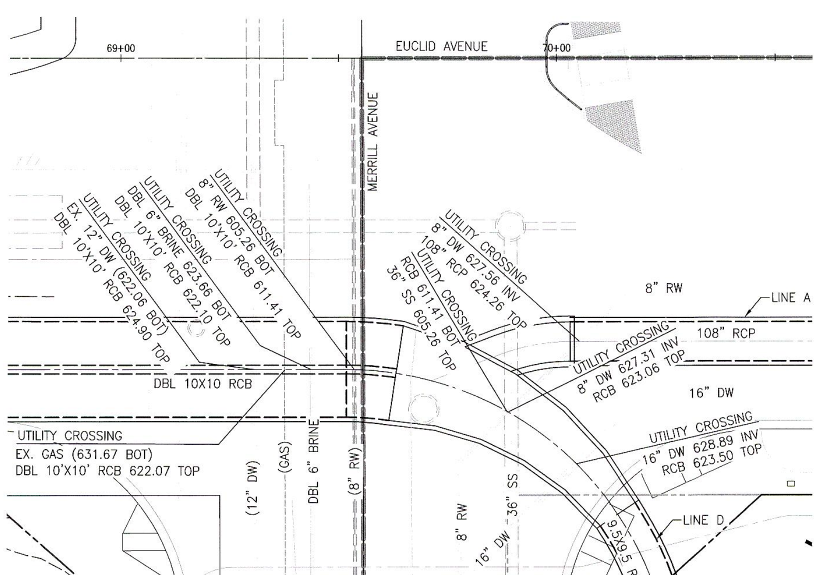
CDS DETAIL "A"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 3



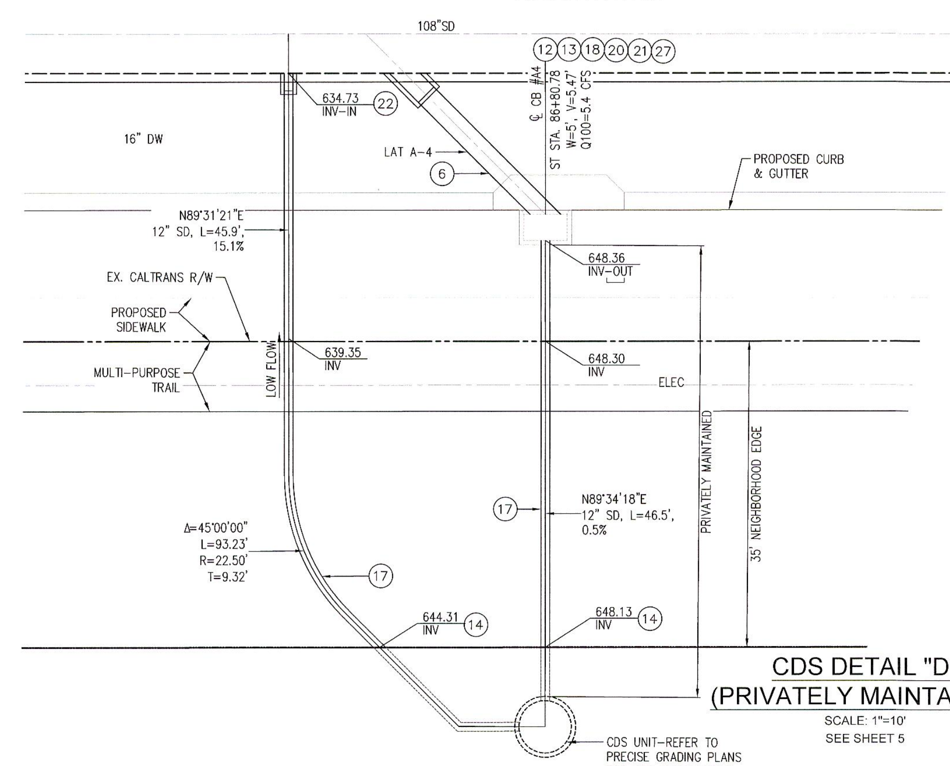
CDS DETAIL "B"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 4



CDS DETAIL "C"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 5



EUCLID AND MERRILL INTERSECTION
UTILITY CROSSING DETAIL
SCALE: 1"=20'
SEE SHEET 9



CDS DETAIL "D"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 5

CONSTRUCTION NOTES

6	CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
12	CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13	CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
14	CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
17	CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
18	INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11
20	CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21	INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22	CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
20	CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
27	CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12
30	CONSTRUCT 12" RCP CONCRETE COLLAR PER SPPWC STD. 380-4, DETAIL ON SHEET 21
31	CONSTRUCT CDS UNIT, SIZE PER PLAN PER DETAIL 31 ON SHEET 21
32	CONSTRUCT 24" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20

NOTE:

CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ONTARIO PROPERTY OWNERS PER WQMP MALIGNANCE. AGREEMENT.
WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT, AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/18/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

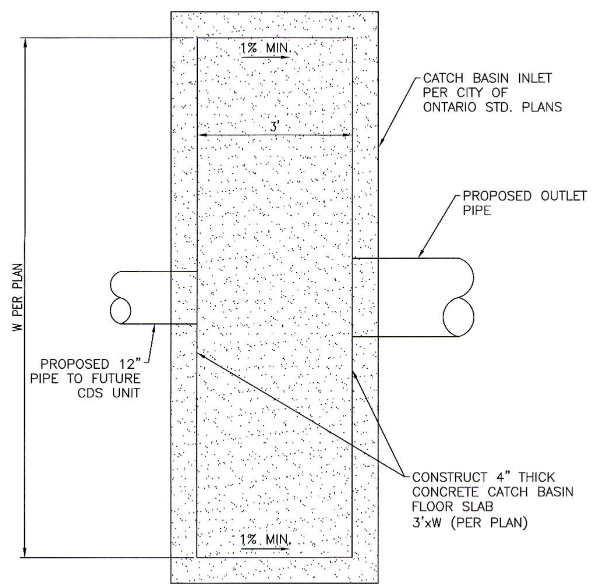
WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
CDS & UTILITY CROSSING DETAILS

PM-20016

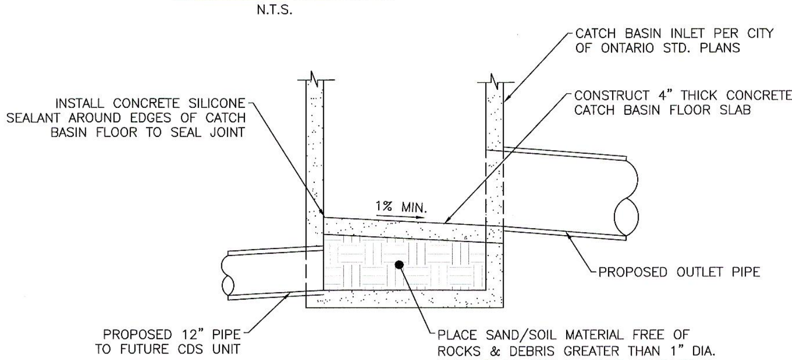
SHEET 10 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD
D14494 06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\10_2020-015_SD-CB DET.dwg
Last Opened: Jun 16, 2022 - 10:22am by: Brent.King



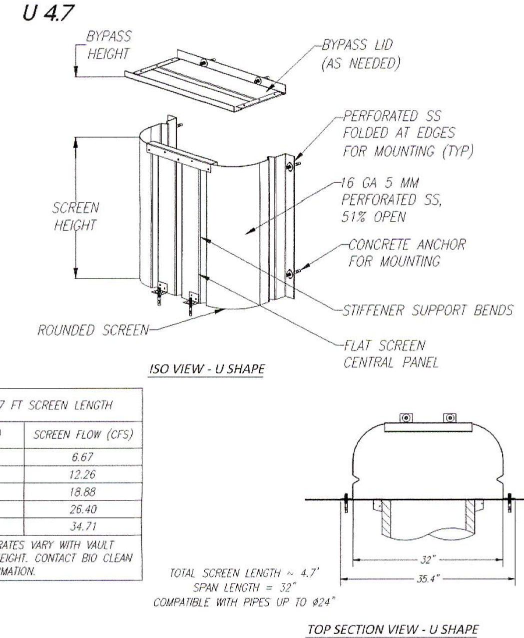
CATCH BASIN - PLAN VIEW

(18) CATCH BASIN - TEMPORARY FLOOR CONSTRUCTION DETAIL
N.T.S.



CATCH BASIN - PROFILE VIEW

CONNECTOR PIPE SCREEN (CPS)
U 4.7



CPS U WITH 4.7 FT SCREEN LENGTH	
CPS HEIGHT (IN)	SCREEN FLOW (CFS)
12	6.67
18	12.26
24	18.88
30	26.40
36	34.71

NOTE: BYPASS FLOW RATES VARY WITH VAULT DEPTH AND BYPASS HEIGHT. CONTACT BIO CLEAN FOR ADDITIONAL INFORMATION.

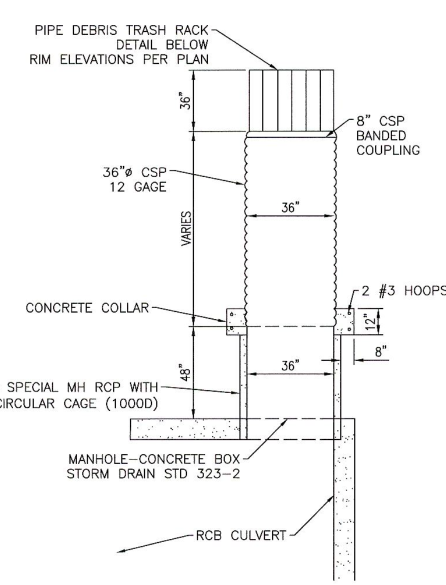
GENERAL NOTES

1. BIO CLEAN TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS, AND CAPACITIES ARE SUBJECT TO CHANGE.
3. THIS CPS UNIT IS DESIGNED FOR TREATMENT FLOWS THROUGH THE SCREEN. FLOWS GREATER THAN THE TREATMENT FLOW RATE WILL BYPASS OVER THE SCREEN.
4. A BYPASS LID IS REQUIRED WHEN THE OUTLET PIPE IS DIRECTLY BELOW THE CURB OPENING.
5. CPS IS COMPRISED OF 304 STAINLESS STEEL. THICKNESS IS 16 GAUGE. SCREEN PERFORATIONS ARE 5 MILLIMETERS IN DIAMETER. THE SCREEN AREA IS 51% OPEN SPACE.

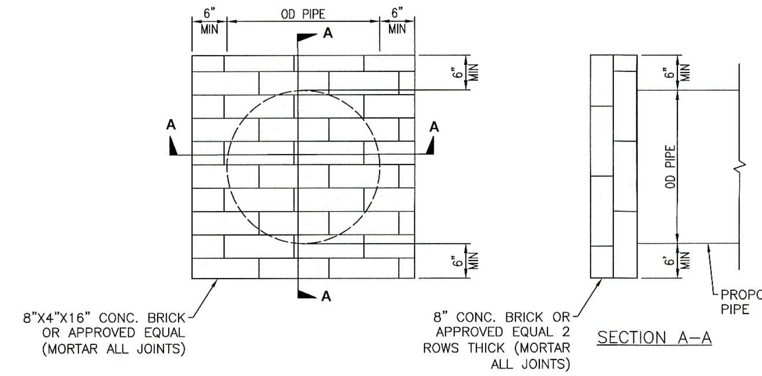
INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS REQUIRED TO INSTALL THE CPS UNIT AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. POSITION THE CPS SO IT IS EVENLY SPACED AROUND THE CONNECTOR PIPE, ENSURING A MIN. OF 4" SPACING AWAY FROM ANY CORNERS. SCREEN BOTTOM SHALL BE FLUSH WITH THE CATCH BASIN FLOOR, OR WITH GAPS NO GREATER THAN 5 MM.
3. IF A BYPASS LID IS REQUIRED, VERIFY THE BYPASS HEIGHT NEEDED AND MARK THAT LOCATION ON THE WALL DIRECTLY ABOVE THE BASE UPRIGHTS. LIFT THE LID IN PLACE AND MARK THE HOLE LOCATIONS FOR THE LID MOUNTING BRACKETS. SECURE THE LID WITH STAINLESS STEEL NUTS.

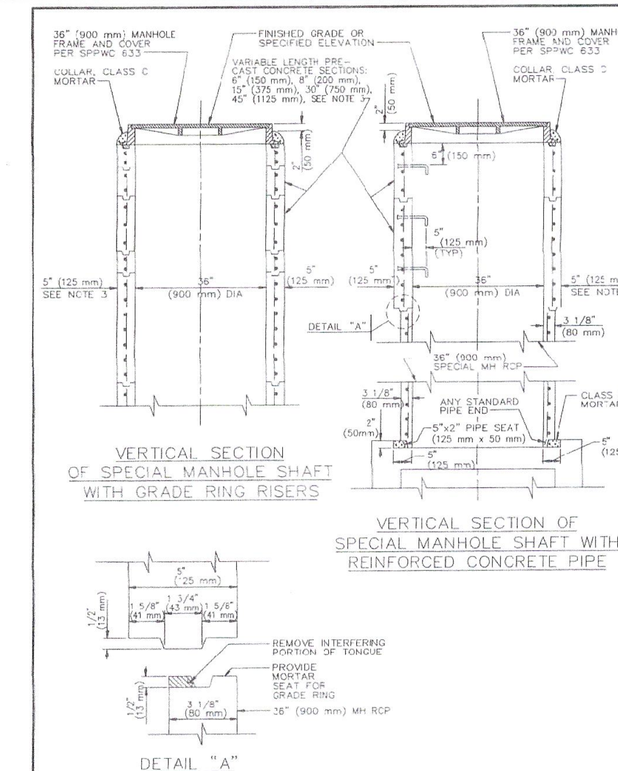
WARRANTY: 3 YEAR MANUFACTURER'S		MEETS FULL CAPTURE REQUIREMENTS		Bio Clean A Forterra Company
BIO CLEAN ENVIRONMENTAL SERVICES, INC. 398 VIA EL CENTRO, OCEANSIDE CA 92058 PHONE: 760-433-7640		REVISIONS:	DATE:	
		REVISIONS:	DATE:	
DATE: 1/17/2020	SCALE: NTS	REVISIONS:	DATE:	
DRAFTER: G.M.S.	UNITS = INCHES	REVISIONS:	DATE:	



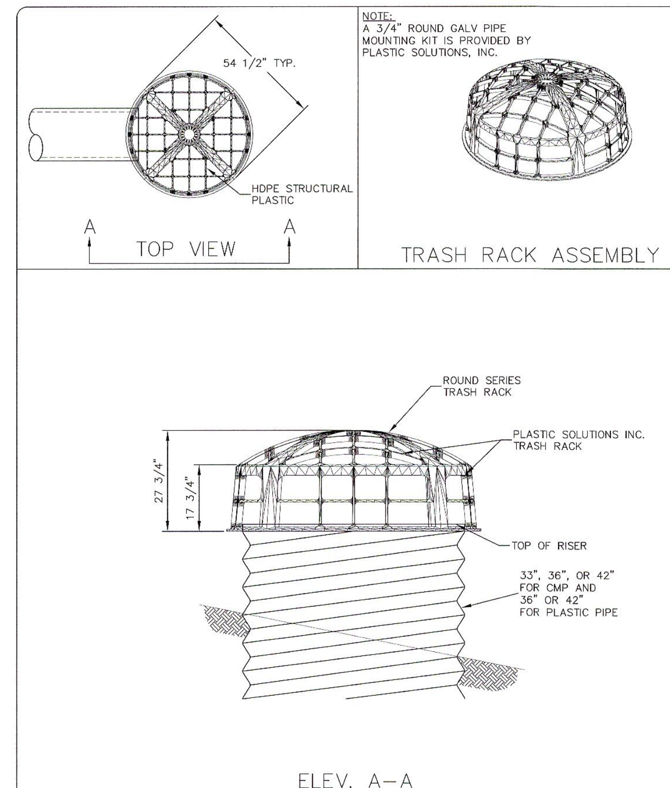
(16) RCB STAND PIPE OUTLET RISER
N.T.S.



(14) BRICK AND MORTAR BULKHEAD DETAIL



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009	MANHOLE SHAFT 36"(900 mm) WITHOUT REDUCER	STANDARD PLAN 326–2
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2



NOTE: **MOUNTING KIT INCLUDED**

PART NO	48" ROUND SERIES TRASH RACK WITH METAL OR PLASTIC RISER	PLASTIC SOLUTIONS INC.	240 McGhee Road P.O. Box 4386 Winchester, VA 22604 540-722-4694 www.plastic-solution.com
RSP-48			

NOTES

1. UNLESS OTHERWISE INDICATED THIS STRUCTURE SHALL CONFORM TO ASTM C 478 (ASTM C 478M). ALL STEEL SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES AND ALL CONCRETE SHALL BE PER SSPWC.
2. WHERE A 36" (900 mm) MANHOLE IS CONSTRUCTED WITH 36" (900 mm) MANHOLE RCP, THE RCP SECTION SHALL CONTAIN A CIRCULAR CAGE AND HAVE A LOAD CARRYING CAPACITY OF AT LEAST 1000D (50D). SPECIAL MANHOLE SHAFT SHALL BE PER THIS STANDARD AND 36" (900 mm) MANHOLE FRAME AND COVER SHALL BE PER SPPWC 633.
3. THE MANHOLE SHAFT AND RINGS MAY BE PLAIN CONCRETE. FOR PLAIN CONCRETE SECTIONS THE MINIMUM THICKNESS SHALL BE 6" (150 mm).
4. ALL JOINTS SHALL BE SEALED BY FILLING THE ANNULAR SPACES WITH CLASS C MORTAR. THE INSIDE OF THE SHAFT AT EACH JOINT SHALL BE WIPED CLEAN OF EXCESS MORTAR.
5. PROTECTIVE PLASTIC LINER (T LOCK) OR ENGINEER–APPROVED COATINGS WHERE REQUIRED BY THE PLANS SHALL BE IN ACCORDANCE WITH SSPWC AND THE MANUFACTURER'S DIRECTIONS.
6. STEPS SHALL CONFORM TO SPPWC 635 OR 636. THE TOP STEP SHALL BE PLACED 6" (150 mm) BENEATH THE MANHOLE COVER FRAME. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC.
7. THE PRECAST CONCRETE MANHOLE STRUCTURES WILL BE INSPECTED BY THE ENGINEER WHO WILL INDICATE ACCEPTANCE FOR SHIPMENT TO THE JOB BY MARKING THE STRUCTURES WITH THE AGENCY'S STAMP.
8. THE VERTICAL SIDES OF THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE STORM DRAIN CONDUIT.
9. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330 IF DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
10. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

633 36" (900 mm) MANHOLE FRAME AND COVER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
MANHOLE SHAFT 36"(900 mm) WITHOUT REDUCER	326–2 SHEET 2 OF 2

811 Know what's below. Call 811 before you dig.

NOTE:
WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN EIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

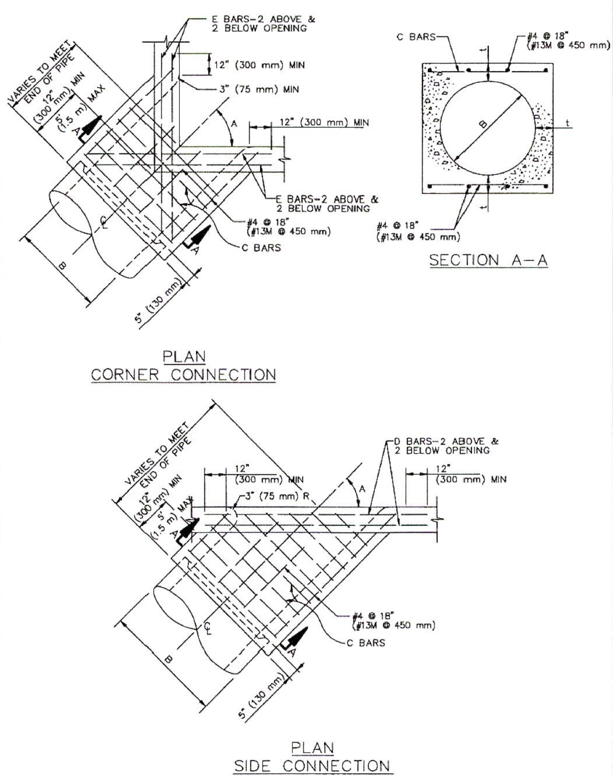
WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

SHEET 11 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949SD
D14495 06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 16, 2022 – 10:27am by: Brent.King



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

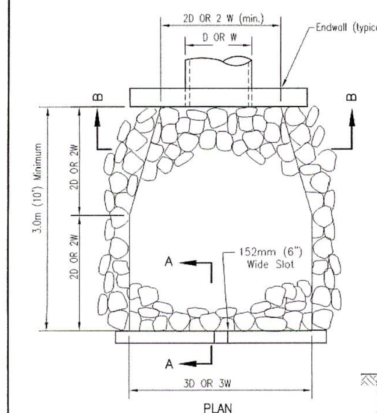
PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC., GREENBOOK COMMITTEE 1984 REV. 1996, 2009

MONOLITHIC CATCH BASIN CONNECTION

STANDARD PLAN 308–2

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

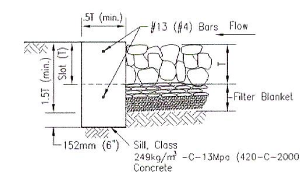
SHEET 1 OF 2



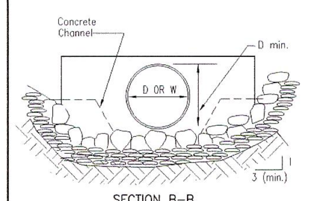
Design Velocity m/sec (ft/sec)*	Rock Classification	T (min)
1.8–3 (6–10)	No. 2 Backing	320mm (1.1ft)
3–3.7 (10–12)	220 kg (1/4 ton)	823mm (2.7ft)
3.7–4.3 (12–14)	450 kg (1/2 ton)	1.1m (3.5ft)
4.3–4.9 (14–16)	900 kg (1 ton)	1.3m (4.4ft)
4.9–5.5 (16–18)	1.8 tonne (2 ton)	1.6m (5.4ft)

*over 5.5 mps (18 fps) requires special design

D = Pipe Diameter
W = Bottom Width of Channel



SECTION A–A



SECTION B–B

NOTES

1. Plans shall specify:
   A) Rock Class and thickness (T).
   B) Filter material, number of layers and thickness.
2. Rip rap shall be either quarry stone or broken concrete (if shown on the plans.) Cobbles are not acceptable.
3. Rip rap shall be placed over filter blanket which may be either granular material or filter fabric (woven filter slit film fabric shall not be used).
4. See Regional Supplement Amendments for selection of filter blanket.
5. Rip rap energy dissipators shall be designated as either Type 1 or Type 2. Type 1 shall be with concrete sill; Type 2 shall be without sill.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Add Rip Rap Table		S. Brady	04/06

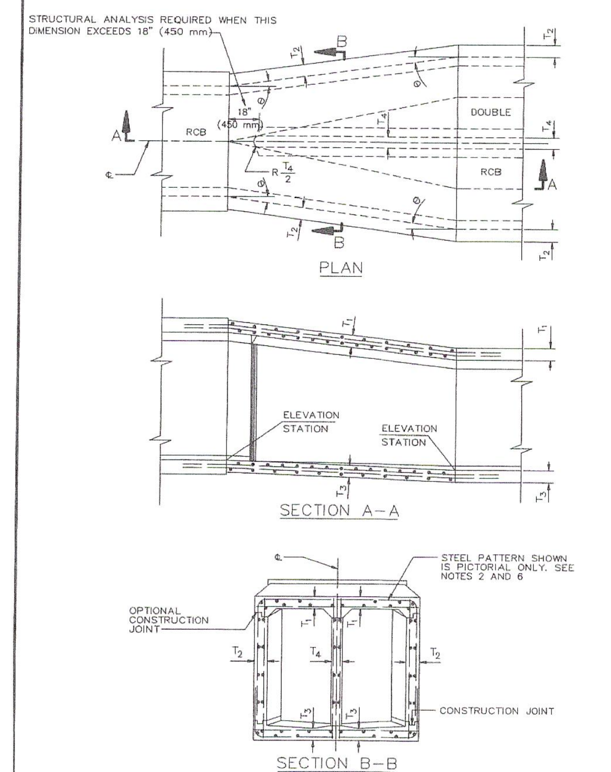
SAN DIEGO REGIONAL STANDARD DRAWING

RIP RAP ENERGY DISSIPATOR

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE 04/27/2006

Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-40



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 2008

TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB

STANDARD PLAN 343–2

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

SHEET 1 OF 2

NOTES

1. THE HORIZONTAL ANGLE OF DIVERGENCE OR CONVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. REINFORCING STEEL BAR SIZE, SPACING AND OUTSIDE COVER SHALL BE THAT OF DOUBLE RCB SECTION. FOR CURVED TRANSITIONS, SPACE BARS ON CENTER LINE AND PLACE TRANSVERSE STEEL RADIALLY. THE BAR LENGTHS AND DIMENSIONS SHALL VARY UNIFORMLY THROUGHOUT TRANSITION. LONGITUDINAL BARS SHALL BE CONTINUED THROUGH THE JOINTS WITH THE TRANSITION STRUCTURE.
3. THE CONCRETE THICKNESS SHALL BE THAT OF THE DOUBLE RCB SECTION.
4. PLAN AS SHOWN IS FOR DOUBLE RCB SECTION DOWNSTREAM. WHEN DOUBLE RCB SECTION IS UPSTREAM TAPER THE LAST 24" (600 mm) OF CENTER WALL TO END IN 1 1/2" (40 mm) RADIUS.
5. f'_c = 4000 PSI (28 MPa) AT 28 DAYS AND THE CONCRETE SHALL BE THE SAME MIX AS THE ADJACENT RCB.
6. ALL STEEL, EXCEPT LONGITUDINAL STEEL SHALL BE GRADE 60 (400) BILLET STEEL CONFORMING TO ASTM A 615 (A 615 M) AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. TRANSVERSE JOINT KEYWAYS, AS DETAILED FOR LONGITUDINAL JOINT KEYWAYS AT BASE OF OUTER WALLS ON THE PLANS, SHALL BE PLACED IN BOTH SLABS AND WALLS AT THE END OF EACH POUR.
8. THE TRANSITION STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STRUCTURAL NOTES APPLYING TO RCB STRUCTURES SHOWN ON THE PLANS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB

STANDARD PLAN 343–2

SHEET 2 OF 2

STRUCTURAL DATA

B	t	C BARS	D&E BARS	B	t	C BARS	D&E BARS
12" (300 mm)	4" (115 mm)	#4 @ 6" (#13M @ 150 mm)	#5 (#16M)	42" (1050 mm)	7 1/2" (190 mm)	#5 @ 6" (#16M @ 150 mm)	#6 (#19M)
15" (375 mm)	4-1/4" (115 mm)			45" (1125 mm)	7 3/4" (190 mm)		
18" (450 mm)	4-1/2" (115 mm)			48" (1200 mm)	8" (215 mm)		
21" (525 mm)	5" (140 mm)			51" (1275 mm)	8 1/2" (215 mm)		
24" (600 mm)	5 1/4" (140 mm)			54" (1350 mm)	9" (240 mm)		
27" (675 mm)	5 1/2" (140 mm)			57" (1425 mm)	9 1/4" (240 mm)		
30" (750 mm)	6" (165 mm)			60" (1500 mm)	9 1/2" (240 mm)		
33" (825 mm)	6 1/4" (165 mm)			63" (1575 mm)	10" (260 mm)		
36" (900 mm)	6 1/2" (165 mm)			66" (1650 mm)	10 1/4" (260 mm)		
39" (975 mm)	7" (190 mm)			69" (1725 mm)	10 3/4" (280 mm)		
				72" (1800 mm)	11" (280 mm)		
FOR B GREATER THAN 72" (1800 mm) SEE PLANS							

NOTES

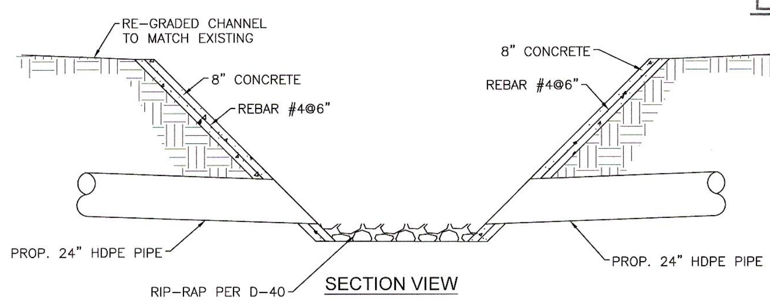
1. REINFORCING STEEL SHALL BE 1-1/2" (40 mm) CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CATCH BASIN CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN SHALL BE CUT 2" (50 mm) CLEAR OF OPENING.
3. CONNECTION SHALL BE PLACED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY PLACING CONCRETE WITH THE SAME CLASS OF CONCRETE AS THE CATCH BASIN AGAINST A CURVED FORM WITH A RADIUS OF 3" (75 mm).
4. CONNECTIONS SHALL BE CONSTRUCTED WHEN:
   (A) PIPES INLET OR OUTLET THROUGH CORNER OF CATCH BASIN
   (B) ANGLE A FOR PIPES THROUGH 30" (750 mm) IN DIAMETER IS LESS THAN 70° OR GREATER THAN 110°.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

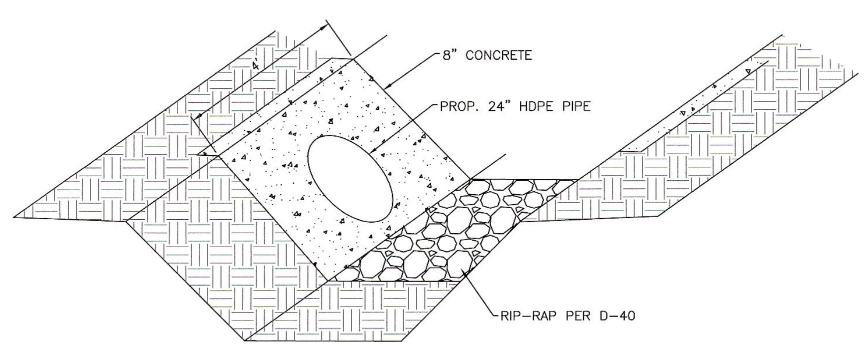
MONOLITHIC CATCH BASIN CONNECTION

STANDARD PLAN 308–2

SHEET 2 OF 2



SECTION VIEW



ISOMETRIC VIEW

(25) CHANNEL CONCRETE END WALL DETAIL

N.T.S.

Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: 8/8/22

CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FCA 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. R.C.E. NO. 85559 6/22/22 DATE

CALTRANS # 08-22-6-UT-0007

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 12 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14496 06/08/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 08, 2022 - 4:15pm by: Brent.King

DESIGN NOTES:

Design Specifications:
AASHTO LRFD Bridge Design Specifications, 6th Edition with California Amendments.

Loading:
Live load: (AASHTO LRFD 3.6.1.2)
HL-93 consists of design truck or design tandem and design lane load.

Impact Factor: (Apply to roof slab only)
$IM = 33(1.0 - 0.125D_E) \geq 0\%$ (AASHTO LRFD 3.6.2.2)
D_E = minimum depth of earth cover

Earth load:
Earth pressure for two conditions:
140 pcf vertical, 42 pcf horizontal
140 pcf vertical, 140 pcf horizontal

Load Factors:
AASHTO LRFD Table 3.4.1-1 & Table 3.4.1-2

Unit stresses:
f'_c = 3600 psi
f_y = 60,000 psi

Distribution "d" bars:
Up to and including 10'-0" cover
Express as a percentage of main positive reinforcement required: $\frac{100}{\sqrt{S}}$, Max 50%,
Over 10'-0" cover,
\# 4 @ 12 maximum

Shear:
$V_c = (2.14\sqrt{f'_c} + 4600 \frac{A_s}{bd_e}\frac{V_u d_e}{M_u})b.d_e \leq 4.0\sqrt{f'_c}b.d_e$ (Pounds)
V_c shall not be less than $3.00\sqrt{f'_c}b.d_e$ for frame members and $2.5\sqrt{f'_c}b.d_e$ for simply supported members.

Exclusion:
Compressive reinforcement and negative moment reduction (for continuity) do not apply.
Axial loading on members has not been considered.

CONSTRUCTION NOTES:

Construction loads:
Strutting required as shown on Standard Plan D88.
Strutting may be required on culvert extensions when existing parapet is removed.

Expansion joints:
Invert:
No expansion joints shall be permitted.

Roof and Walls:
When cover is less than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers outside the paved roadway lanes and place Bridge Detail 3-2, Standard Plan B0-3, at 30'-0" centers under paved roadway lanes.
When cover is more than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers and additional ½" premolded expansion joints at locations of change in foundation character, as directed by the Engineer.

Construction joints:
Temporary joints may be permitted if normal (or radial) to ℄ of RCB. Otherwise, the contractor is to submit a proposal for consideration.

Cutoff walls:
4'-0" cutoff walls are to be provided at inlet and/or outlet unless adjacent channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant.

Earthwork:
See Standard Plan A62E.

Backfill:
See Standard Specifications, except that the difference in level of backfill (against outside walls) shall not exceed 2'-0".

GENERAL NOTES:

Designation:
Standard single or multiple box culverts are shown on plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10' or double 10' x 5' RCB with 20', followed by alternatives.

Alternatives:
Single cell: Invert will be sloped unless "trapezoidal invert", "flat invert" or "V invert" is included in designation.
Multiple cell: Invert will be vee unless "flat invert" is specified. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown unless designated in plans. Such designations may be different for inlet and outlet ends.

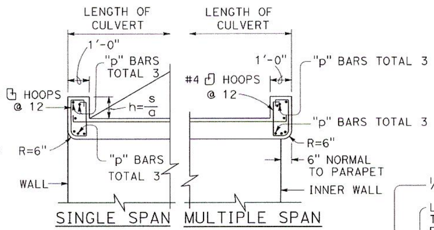
Quantities:
Quantities do not include the following:
• Concrete for parapet, paving notches and cut-off wall.
• Reinforcement for 2% splices, parapets, paving notches, cut-off wall and additional required bars for exposed top slab (D-80, Note 9).

Reinforcement placement:
Main reinforcement is to be placed transversely or, for curved culverts, radially. When radial, reinforcing spacing of the "a", "f" and "g" bars is measured along the centerline. Stagger splices not shown. Hooks may be rotated or tilted, as necessary, for clearance.

Special reinforcement coverage:
Box standard plans are not to be used for culverts in a corrosive environment or where there is a severe abrasive flow condition or in freeze-thaw locations.

Special design:
Required for culverts with conditions, loads, design bearing pressures or sizes greater than those given on this plan or Standard Plans D80 & D81. Also required for multiple cell culverts with unequal spans. For culverts with railroad loading, see the current AREMA design specification.

3 or more cells:
For culverts with more than two cells, use dimensions and reinforcement for the standard "double box culvert" and adjust quantities accordingly.



SINGLE SPAN MULTIPLE SPAN

PARAPET DETAIL

s = Clear span (ft)
a = 12 cosine skew angle
h = Height, 1'-0" Min

PARAPET "p" BARS			
SKEW ANGLE / SPAN	0° TO 15°	16° TO 30°	31° TO 45°
4'	#4	#4	#4
6'	#4	#4	#5
8'	#4	#5	#6
10'	#5	#6	#7
12'	#6	#7	#8
14'	#7	#8	#9

PARAPET REINFORCEMENT

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

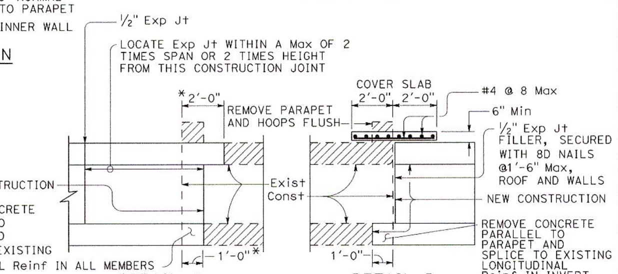
REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER Carl W. Bush C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA



DETAIL A

20° maximum skew as shown. If existing longitudinal and transverse reinforcing bars in top slab are lap spliced with new longitudinal and transverse reinforcing bars, the 20° skew may be exceeded. Lap splicing may require removal of top slab in excess of 2'-0" shown.

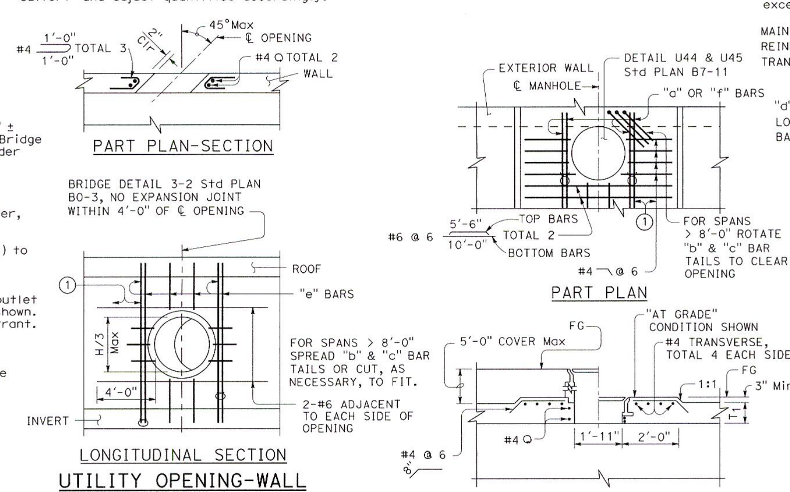
DETAIL B

Single cell only, no skew allowed, 1'-0" minimum cover.

* Measured perpendicular to parapet

CULVERT EXTENSION

2018 STANDARD PLAN D82



PART PLAN-SECTION

LONGITUDINAL SECTION

UTILITY OPENING-WALL

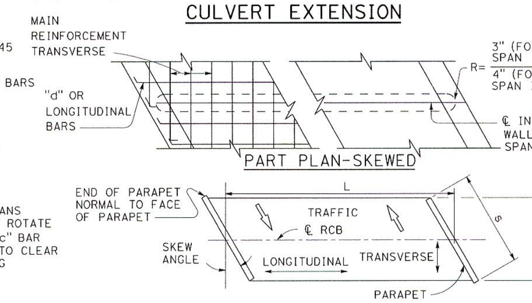
H=Height of box

① Adjacent to each side of the opening, place additional bars equivalent to half the interrupted main reinforcement.

PART PLAN

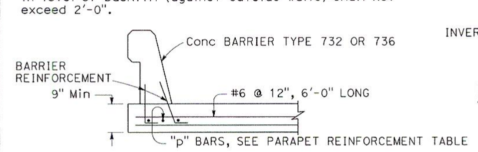
PART LONGITUDINAL SECTION

MANHOLE



PART PLAN-SKEWED

RCB TERMINOLOGY



BARRIER SECTION (30'-0" MINIMUM)

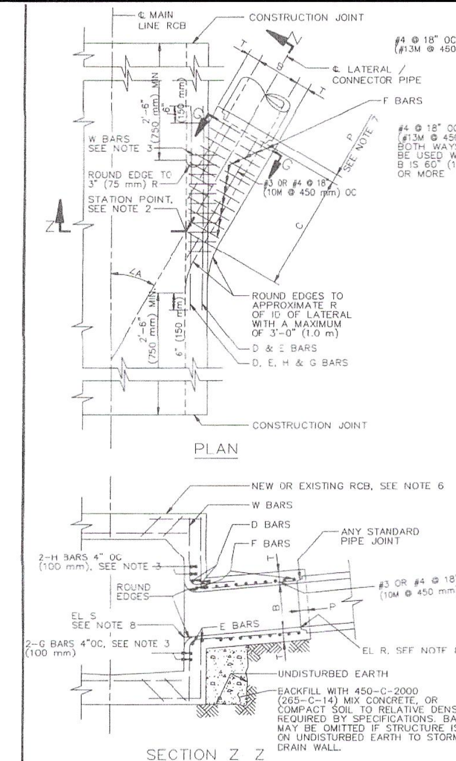
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS

NO SCALE

D82

1-29-18



B	T	D, E, H & G BARS	F BARS
12" (300 mm)	5" (130 mm)	#5 (#16M)	#4 @ 6" (#13M @ 150 mm) OC
15" (375 mm)	5" (130 mm)		
18" (450 mm)	5" (130 mm)		
21" (525 mm)	5" (130 mm)		
24" (600 mm)	5 1/4" (140 mm)		
27" (675 mm)	5 1/2" (140 mm)		
30" (750 mm)	6" (160 mm)		
33" (825 mm)	6 1/4" (160 mm)		
36" (975 mm)	6 1/2" (170 mm)		
39" (990 mm)	7" (180 mm)		
42" (1050 mm)	7 1/2" (190 mm)	#6 (#19M)	#5 @ 6" (#16M @ 150 mm) OC
45" (1125 mm)	7 3/4" (200 mm)		
48" (1220 mm)	8" (210 mm)		
51" (1275 mm)	8 1/2" (220 mm)		
54" (1350 mm)	9" (230 mm)		
57" (1500 mm)	9 1/4" (240 mm)		
60" (1500 mm)	9 1/2" (240 mm)		
63" (1650 mm)	10" (260 mm)		
66" (1680 mm)	10 1/4" (260 mm)		
69" (1800 mm)	10 3/4" (280 mm)		
72" (1850 mm)	11 (280 mm)		
78" (1950 mm)	11 3/4" (300 mm)		
84" (2100 mm)	12 1/2" (320 mm)		
90" (2400 mm)	13 1/4" (340 mm)	#7 (#22M)	#5 @ 6" (#16M @ 150 mm) OC
96" (2440 mm)	14" (360 mm)		
102" (2550 mm)	15 1/2" (400 mm)		
108" (2700 mm)	16" (410 mm)		
114" (3000 mm)	16 1/2" (420 mm)		
120" (3050 mm)	17" (430 mm)		
126" (3150 mm)	17" (430 mm)		
132" (3300 mm)	17 1/2" (450 mm)		
138" (3450 mm)	17 1/2" (450 mm)		
144" (3600 mm)	18" (460 mm)		

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1994 REV. 1996, 2009

JUNCTION STRUCTURE - PIPE TO RCB

STANDARD PLAN 333-2 SHEET 1 OF 2

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

NOTES

1. VALUES FOR A, B AND C SHALL BE SHOWN ON THE PLANS. *ELEVATION R AND ELEVATION S SHALL BE SHOWN WHEN REQUIRED PER NOTE 8.*
2. STATIONS SPECIFIED ON THE PLANS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERALS, EXCEPT THAT STATIONS FOR CATCH BASIN CONNECTOR PIPES APPLY AT INSIDE WALL OF STRUCTURE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
   a. W BARS ARE OF SIZE AND SPACING SPECIFIED FOR WALL STEEL ON PLANS, AND SHALL BE CUT IN CENTER OF OPENING AND BENT INTO TOP AND BOTTOM OF JUNCTION STRUCTURE.
   b. OMIT H BARS WHEN SOFFIT OF SPUR IS 12" (300 mm) OR LESS BELOW *SOFFIT OF MAIN LINE, AND OMIT G BARS WHEN INVERT OF SPUR IS* 12" (300 mm) OR LESS ABOVE FLOOR OF MAIN LINE.
4. JUNCTION STRUCTURE SHALL BE POURED MONOLITHICALLY WITH MAIN LINE, MANHOLE OR TRANSITION STRUCTURE.
5. FLOOR OF STRUCTURE SHALL BE STEEL-TROWELED TO THE SPRING LINE.
6. WHEN CONNECTING TO EXISTING RCB, BREAKOUT LIMITS AND DETAILS SHALL BE SHOWN ON THE PLANS.
7. EMBEDMENT, P, SHALL BE 5" (130 mm) FOR B = 96" (2400 mm) OR LESS 8" (200 mm) FOR B OVER 96" (2400 mm).
8. IF ELEVATION R AND ELEVATION S ARE NOT SHOWN ON THE PLANS *THEN THE INLET OPENING SHALL FALL 6" (150 mm) BELOW* THE SOFFIT OF THE MAIN LINE WITH THE INLET PIPE LAID ON A STRAIGHT GRADE FROM MAIN LINE TO CATCH BASIN OR TO GRADE BREAK IN INLET LINE. ELEVATION S SHALL BE SHOWN ON THE PLANS IF THE INLET OPENING FALLS MORE THAN 6" (150 mm) BELOW THE SOFFIT OF THE MAIN LINE WITH THE INLET PIPE LAID ON A STRAIGHT GRADE AS STATED ABOVE.
   ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN A STUB IS TO BE PROVIDED FOR A FUTURE CONNECTION.
9. LATERALS OR CONNECTOR PIPES 24" (600 mm) OR LESS IN DIAMETER SHALL BE NO MORE THAN 5' (1.5 m) ABOVE THE INVERT. LATERALS OR CONNECTOR PIPES 27" (675 mm) OR LARGER IN DIAMETER SHALL BE NO MORE THAN 18" (450 mm) ABOVE THE INVERT, WITH THE EXCEPTION THAT CATCH BASIN CONNECTOR PIPES LESS THAN 50' (15 m) IN LENGTH SHALL *NOT BE MORE THAN 5' (1.5 m) ABOVE THE INVERT.*
10. THE NEED FOR AN EDGE BEAM AND/OR ADDITIONAL REINFORCEMENT SHALL BE NVESTIGATED BY THE ENGINEER FOR ANY ONE OF THE FOLLOWING CONDITIONS:
    a. ANGLE A IS LESS THAN 30°
    b. TOP OF INLET PIPE IS LESS THAN 6" (150 mm) BELOW THE SOFFIT
    c. FLOW LINE OF INLET PIPE IS LESS THAN 7" (180 mm) ABOVE THE THE FLOOR OF THE RCB AT THE INSIDE FACE

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

JUNCTION STRUCTURE - PIPE TO RCB

STANDARD PLAN 333-2 SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

Know what's **below.** **Call 811 before you dig.**

CITY OF CHINO

RECOMMENDED BY: [signature] 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

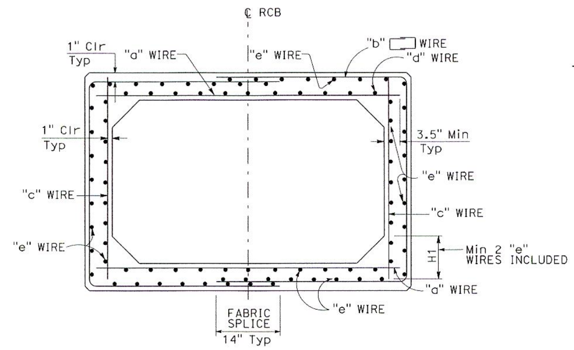
PM-20016

SHEET 13 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

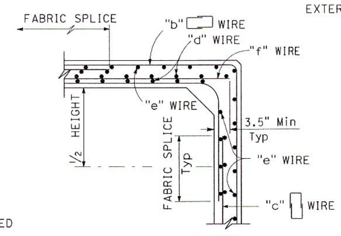
D14497 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:05pm by: Brent.King

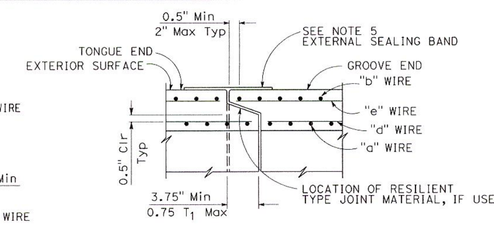
224



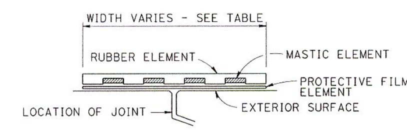
TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"



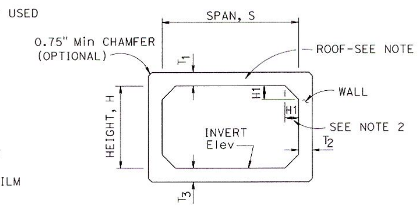
ALTERNATIVE DETAILING OPTION



END JOINT DETAIL



EXTERNAL SEALING BAND SCHEMATIC



SCHEMATIC

TABLE	
SPAN	EXTERNAL SEALING BAND WIDTH
4'-6'	9"
7'-8'	11"
10'-12'	13"

SPAN, S		4'						5'							
HEIGHT, H		2'		3'		4'		2'		3'		4'		5'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH) ROOF	T_1	5.5"	5.5"	5.5"	5.5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	6"	6"
SIDE WALL	T_2	5.5"	5.5"	5.5"	5.5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	6"	6"
INVERT	T_3	5.5"	5.5"	5.5"	5.5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	6"	6"
MINIMUM WELDED WIRE FABRIC ($inch^2/ft$)	"a"	.33	.47	.34	.49	.34	.50	.40	.62	.41	.62	.42	.64	.43	.64
	"b"	.23	.28	.23	.25	.21	.23	.26	.36	.24	.36	.24	.33	.24	.30
	"c"	.11	.11	.11	.12	.18	.24	.11	.11	.11	.11	.13	.23	.24	.34
	"d"	.16	.11	.16	.11	.16	.11	.17	.11	.18	.11	.18	.11	.18	.11
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
	"f"	.22	.36	.23	.37	.22	.26	.29	.51	.30	.51	.29	.41	.26	.30
* QUANTITY Conc	CY/LF	.31		.34		.38		.37		.41		.44		.48	
Reinf	LB/LF	35	41	39	45	45	51	49	58	49	62	54	69	62	78
** SOIL PRESSURE (ksf)		2.3	4.4	2.4	4.5	2.4	4.5	3.1	4.4	3.1	4.5	3.1	4.5	3.2	4.5

SPAN, S		6'								7'									
HEIGHT, H		3'		4'		5'		6'		3'		4'		5'		6'		7'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH) ROOF	T_1	7"	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
SIDE WALL	T_2	7"	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
INVERT	T_3	7"	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
MINIMUM WELDED WIRE FABRIC ($inch^2/ft$)	"a"	.44	.67	.45	.70	.46	.71	.47	.72	.47	.72	.48	.75	.50	.78	.50	.79	.51	.80
	"b"	.28	.44	.27	.40	.27	.37	.27	.38	.33	.52	.31	.48	.30	.45	.30	.43	.30	.48
	"c"	.11	.11	.11	.12	.19	.27	.27	.42	.11	.11	.11	.11	.13	.20	.26	.31	.30	.50
	"d"	.17	.11	.18	.11	.18	.11	.18	.11	.17	.11	.17	.11	.18	.11	.18	.11	.18	.11
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
	"f"	.33	.56	.34	.58	.27	.44	.21	.30	.36	.61	.37	.64	.37	.57	.25	.48	.21	.30
* QUANTITY Conc	CY/LF	.51		.56		.60		.64		.63		.68		.73		.78		.83	
Reinf	LB/LF	60	79	64	83	72	93	80	107	72	98	76	102	81	110	92	120	101	143
** SOIL PRESSURE (ksf)		2.7	4.5	2.8	4.5	2.8	4.6	2.8	4.6	2.5	4.5	2.5	4.6	2.5	4.6	2.5	4.6	2.6	4.6

SPAN, S		8'									
HEIGHT, H		4'		5'		6'		7'		8'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH) ROOF	T_1	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"
SIDE WALL	T_2	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"
INVERT	T_3	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"
MINIMUM WELDED WIRE FABRIC ($inch^2/ft$)	"a"	.55	.87	.56	.90	.57	.92	.58	.93	.58	.94
	"b"	.37	.59	.35	.55	.33	.52	.33	.52	.36	.57
	"c"	.11	.11	.11	.11	.20	.31	.31	.42	.38	.62
	"d"	.19	.11	.19	.11	.20	.11	.20	.11	.20	.11
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
	"f"	.44	.76	.45	.79	.37	.61	.27	.52	.20	.31
* QUANTITY Conc	CY/LF	.78		.83		.88		.94		.99	
Reinf	LB/LF	93	129	97	133	105	148	117	161	131	189
** SOIL PRESSURE (ksf)		2.5	4.6	2.5	4.6	2.5	4.6	2.5	4.6	2.5	4.6

SPAN, S		10'											
HEIGHT, H		5'		6'		7'		8'		9'		10'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH) ROOF	T_1	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"
SIDE WALL	T_2	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"
INVERT	T_3	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"
MINIMUM WELDED WIRE FABRIC ($inch^2/ft$)	"a"	.66	1.07	.67	1.10	.69	1.13	.70	1.14	.70	1.16	.71	1.16
	"b"	.45	.74	.43	.70	.41	.67	.40	.64	.43	.67	.48	.67
	"c"	.11	.11	.11	.11	.22	.31	.36	.42	.40	.62	.54	.86
	"d"	.20	.11	.20	.11	.21	.11	.21	.11	.21	.11	.21	.11
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
	"f"	.55	.96	.56	.99	.47	.81	.34	.73	.31	.53	.16	.30
* QUANTITY Conc	CY/LF	1.10		1.17		1.23		1.29		1.35		1.41	
Reinf	LB/LF	133	191	138	196	148	212	191	225	176	253	201	282
** SOIL PRESSURE (ksf)		3.8	4.6	3.8	4.7	3.8	4.7	4.6	4.7	3.9	4.7	3.9	4.8

SPAN, S		12'													
HEIGHT, H		6'		7'		8'		9'		10'		11'		12'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH) ROOF	T_1	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
SIDE WALL	T_2	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
INVERT	T_3	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
MINIMUM WELDED WIRE FABRIC ($inch^2/ft$)	"a"	.73	1.21	1.21	1.24	.77	1.27	1.24	1.29	1.27	1.31	.78	1.32	1.29	1.32
	"b"	.51	.85	.85	.81	.49	.77	.81	.74	.77	.77	.53	.79	.74	.79
	"c"	.11	.11	.11	.11	.23	.30	.37	.42	.42	.60	.54	.82	.42	1.06
	"d"	.20	.11	.20	.11	.21	.11	.22	.11	.22	.11	.22	.11	.22	.11
	"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
	"f"	.62	1.10	1.10	1.13	.64	.97	1.13	.87	.97	.71	.40	.50	.87	.26
* QUANTITY Conc	CY/LF	1.56		1.63		1.70		1.78		1.85		1.93		2.00	
Reinf	LB/LF	174	255	179	261	191	279	207	293	223	323	249	357	281	393
** SOIL PRESSURE (ksf)		3.6	4.7	3.7	4.7	3.7	4.8	3.7	4.8	3.7	4.8	3.8	4.9	3.8	4.9

* See Note 3   ** See Note 6

NOTES:

1. The inside and outside surfaces of the RCB roof shall be marked "TOP".
2. H1 minimum shall equal the wall thickness. H1 maximum shall be 8" for spans through 8' and 14" for spans over 8'.
3. Quantities are approximate and for design purposes only.
4. For design and details not shown see Standard Plan D83B.
5. For external sealing band applications see Standard Plan A62G.
6. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Carl W. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

2018 STANDARD PLAN D83A

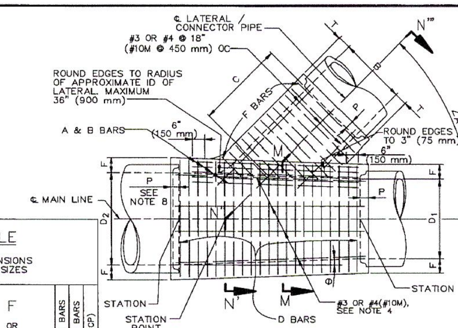
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PRECAST REINFORCED CONCRETE BOX CULVERT

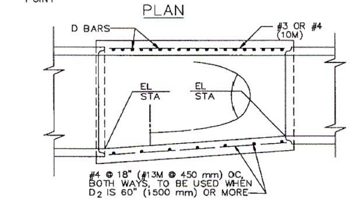
NO SCALE

D83A

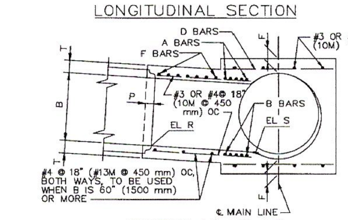
1-29-18



PLAN



LONGITUDINAL SECTION



SECTION N'-N"-N"'
PROJECTED ON M-M-N"'

TABLE
FOR DIMENSIONS AND BAR SIZES

D_2 OR B (INCHES)	(mm)	F OR T (INCHES)	(mm)	A OR B BARS	D OR F BARS	P (RCP)
12	300	4	110	#5 @ 3" (#16M @ 75 mm) OC	#4 @ 6" (#13M @ 150 mm) OC	5" (125 mm)
15	375	4 1/4	110			
18	450	4 1/2	120			
21	525	5	130			
24	600	5 1/4	140			
27	675	5 1/2	140			
30	750	6	160			
33	825	6 1/4	160			
36	900	6 1/2	170			
39	975	7	180			
42	1050	7 1/2	190	#6 @ 3" (#19M @ 75 mm) OC	#5 @ 6" (#16M @ 150 mm) OC	
45	1125	7 3/4	200			
48	1200	8	210			
51	1275	8 1/2	220			
54	1350	9	230			
57	1425	9 1/4	240			
60	1500	9 1/2	250			
63	1575	10	260			
66	1650	10 1/4	260			
69	1725	10 3/4	280			
72	1800	11	280			
78	1950	11 3/4	300			
84	2100	12 1/2	320			
90	2250	13 1/4	340	#7 @ 3" (22M @ 75 mm) OC	#6 @ 6" (19M @ 150 mm) OC	
96	2400	14	360			
102	2550	15 1/2	400			8" (200 mm)
108	2700	16	410			
114	2850	16 1/2	420			
120	3000	17	440			
126	3150	17	440			
132	3300	17 1/2	450			
138	3450	17 1/2	450			
144	3600	18	460			

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 2009

TRANSITION STRUCTURE PIPE TO PIPE

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 340-2 SHEET 1 OF 2

NOTES

1. THE HORIZONTAL ANGLE OF CONVERGENCE OR DIVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. VALUES FOR A, B, C, D_1 AND D_2 ARE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S ARE SHOWN WHEN REQUIRED BY NOTE 10.
3. FLOOR OF STRUCTURE SHALL BE STEEL TROWELED TO SPRING LINE.
4. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A 615 (A 615 M), GRADE 300 (40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. LONGITUDINAL BARS SHALL BE #3 OR #4 @ 18" (#10M @ 450 mm) OC OR LESS.
5. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
6. TRANSITION STRUCTURE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT LONGITUDINAL KEYWAY.
7. THE LENGTH OF THE STRUCTURE MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET RCP ENDS, USING D BARS, LONGITUDINAL AND BOTTOM REINFORCEMENT IN EXTENDED PORTION OF SAME DIAMETER AND SPACING AS SPECIFIED IN THE TABLE, BUT ANY CHANGE IN THE LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.
8. EMBEDMENT P SHALL BE AS SPECIFIED IN THE TABLE, UNLESS OTHERWISE SHOWN ON THE PLANS.
9. WHEN THERE IS NO SPUR REQUIRED, A & B BARS SHALL BE OMITTED.
10. WHEN ELEVATION R AND ELEVATION S ARE NOT SHOWN ON PLANS, INLET PIPE SHALL ENTER MAIN LINE RADIALLY. WHEN INLET PIPE ENTERS MAIN LINE OTHER THAN RADIALLY, ELEVATION S SHALL BE SHOWN ON PLANS, AND INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO CATCH BASIN OR GRADE BREAK IN INLET LINE. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN STUB IS TO BE PROVIDED IN MAIN LINE FOR FUTURE CONSTRUCTION OF INLET PIPE.
11. THE MAXIMUM COVER ABOVE THIS STRUCTURE SHALL BE 25' (7.5 m). IF THE COVER EXCEEDS 25' (7.5 m') A SPECIAL STRUCTURE SHALL BE DESIGNED FOR THE COVER AND DETAILED ON THE PLANS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

TRANSITION STRUCTURE PIPE TO PIPE

STANDARD PLAN 340-2 SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 14 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14498 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:05pm by: Brent.King

225

DESIGN NOTES:

Specifications:

AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.

Earth load:

Earth pressures for two conditions:
140 pcf Vert, 42 pcf Horiz
140 pcf Vert, 140 pcf Horiz

Unit stresses:

f'c = 5.0 ksi
fy = 65.0 ksi for weld wire fabric
n = 7

Shear:

Based on

$V_c = \{2.14\sqrt{f'_c}+4600 \frac{A_s}{bd_e}\frac{V_u d_e}{M_u}\} b.d_e \leq 4.0\sqrt{f'_c}b.d_e$ (Pounds)

V_c shall not be less than $3.00\sqrt{f'_c}b.d_e$ for frame members and $2.5\sqrt{f'_c}b.d_e$ for simply supported members.

Exclusion:

Axial loading on the members has not been considered.

GENERAL NOTES:

Designation:

Standard single or multiple precast box culverts are shown on the plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10'-0" or double 10' x 5' RCB with 20'-0", followed by alternatives.

Alternatives:

Single cell:

Standard dimensions of AASHTO Material Specification 'M259' or 'M273'.

Multiple cell:

Constructed by placing single cells adjacent to each other. Inlet and outlet ends of culvert will be rounded unless square ends are designated. Parapet will be shown unless designated in plans. Such designation may be different for inlet and outlet ends.

Limitations:

Where the overfill is less than 12", Precast RCB culverts are not to be used. Precast RCB culverts are not to be used in siphon or pressurized installations unless appropriate "watertight" jointing is provided.

Special reinforcement coverage:

Precast RCB culvert standard plans are not to be used in a corrosive environment or where there is a severe abrasive flow condition or freeze-thaw locations.

Special design:

Required for culvert with different conditions, loads or design bearing pressures greater than those given on these plans. Required for culverts where end details need higher skew angles, higher parapets or barrier sections.

CONSTRUCTION NOTES:

Cutoff walls:

4'-0" Cutoff walls are to be provided at inlet and/or outlet unless channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant. See Standard Plans D84, D85 and D86A.

Wingwalls:

Wingwalls shall be cast-in-place and shall conform to standard plan details for box culvert wingwalls. See Standard Plans D84, D85 and D86A.

Earthwork:

See Standard Plan A62G.

Construction loads:

Strutting may be required near temporary ends. For construction loads on culverts, See Standard Plan D88.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Carl M. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

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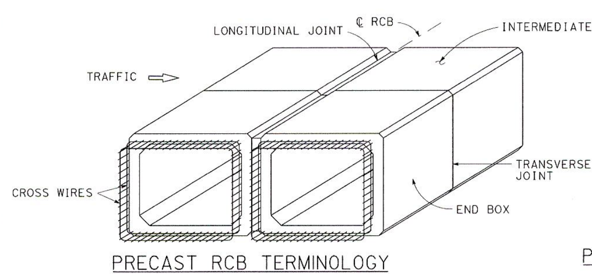
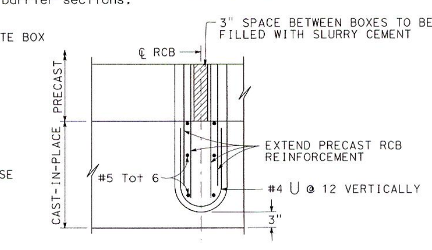


PRECAST RCB TERMINOLOGY

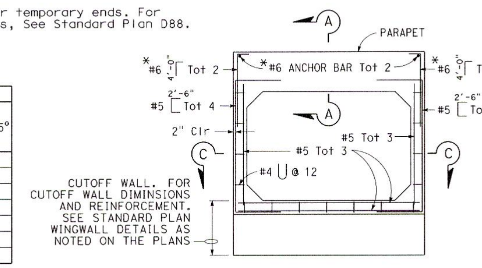
NOTE: Inner and outer reinforcement to be exposed as required to tie to cast-in-place construction. A minimum of two cross wires shall be exposed on all sides.



PARTIAL PLAN INTERIOR WALL MULTICELL CULVERT

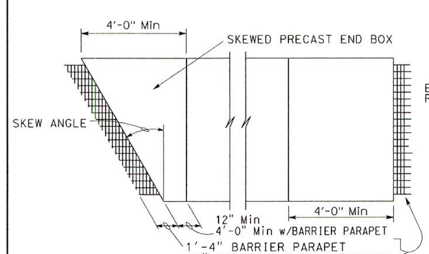
PARAPET "P" BARS			
SKEW ANGLE / SPAN	0° TO 15°	16° TO 30°	31° TO 45°
4'-0"	#5	#5	#5
5'-0"	#5	#5	#6
6'-0"	#6	#6	#6
7'-0"	#7	#7	#7
8'-0"	#7	#7	#8
10'-0"	#8	#8	#9
12'-0"	#9	#9	#10

BARRIER PARAPET REINFORCEMENT



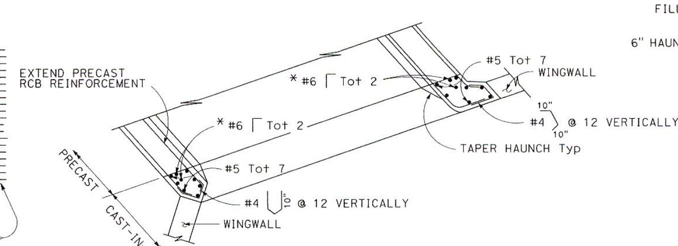
CAST-IN-PLACE END ELEVATION

* Reinforcing required for barrier parapet application only.



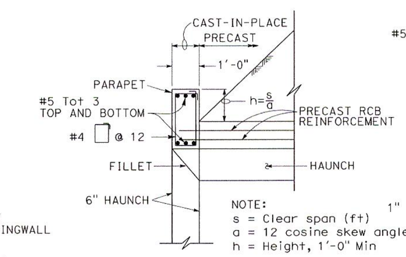
PARTIAL PLAN VIEW

For illustrative purposes only. For correct skew direction see plans.

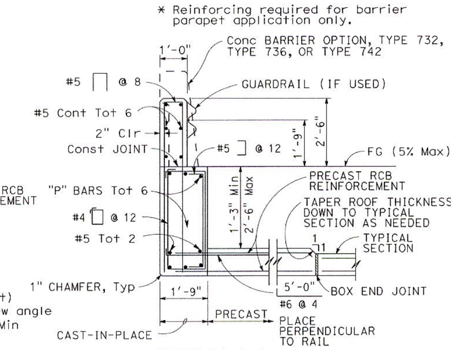


SECTION C-C

* Reinforcing required for barrier parapet application only.



SECTION A-A
(Standard Height Parapet)



SECTION A-A
(Barrier Parapet)

TYPICAL CULVERT END DETAILS

For wall and invert reinforcement not shown, See "End Elevation" detail.

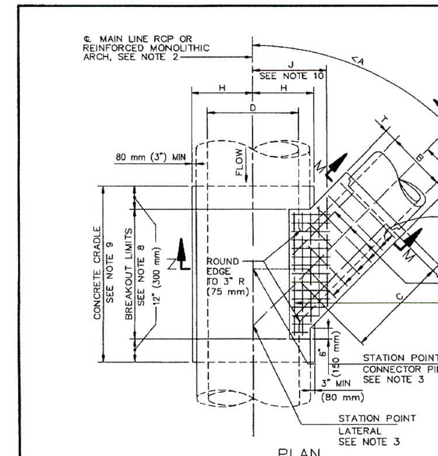
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PRECAST REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS

NO SCALE

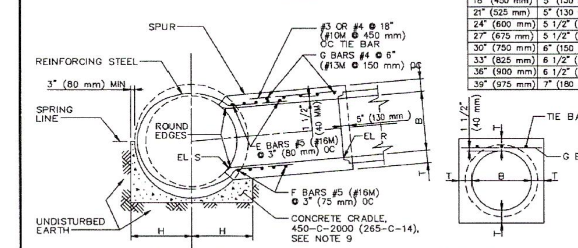
D83B

2018 STANDARD PLAN D83B



PLAN

TABLE OF VALUES FOR T	
B	T
12" (300 mm)	5" (130 mm)
15" (375 mm)	5" (130 mm)
18" (450 mm)	5" (130 mm)
21" (525 mm)	5" (130 mm)
24" (600 mm)	5 1/2" (140 mm)
27" (675 mm)	5 1/2" (140 mm)
30" (750 mm)	6" (150 mm)
33" (825 mm)	6 1/2" (170 mm)
36" (900 mm)	6 1/2" (170 mm)
39" (975 mm)	7" (180 mm)



SECTION Z-Z

SECTION M-M

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		STANDARD PLAN
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 1999, 2009	JUNCTION STRUCTURE–PIPE TO PIPE INLET ID ≥ 24" (600 mm) OR OD > 1/2 MAIN LINE ID USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	331–3 SHEET 1 OF 2

NOTES

1. THIS JUNCTION STRUCTURE SHALL BE USED WHEN THE OUTSIDE DIAMETER OF THE LATERAL IS GREATER THAN 1/2 THE INSIDE DIAMETER D OF THE MAIN LINE; OR WHEN THE INSIDE DIAMETER B OF THE LATERAL IS GREATER THAN 24" (600 mm). B SHALL NOT EXCEED 0.75 D OR 39" (975 mm).
2. IF THE MAIN LINE IS A REINFORCED MONOLITHIC ARCH STORM DRAIN, D SHALL REFER TO THE CLEAR SPAN OF THE ARCH. REINFORCING STEEL SHALL BE CUT AND BENT INTO THE JUNCTION STRUCTURE IN THE SAME MANNER AS FOR A PIPE. A CONCRETE CRADLE IS NOT REQUIRED FOR A REINFORCED MONOLITHIC ARCH.
3. STATIONS SHOWN ON THE PLANS FOR LATERALS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERAL. STATIONS SHOWN ON THE PLANS FOR CATCH BASIN CONNECTOR PIPES APPLY AT THE INTERSECTION OF THE INSIDE WALL OF THE MAIN LINE WITH THE CONNECTOR PIPE CENTERLINE.
4. VALUES FOR A, B, C AND D SHALL BE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S SHALL BE SHOWN ONLY WHEN REQUIRED PER NOTE 5.
5. a. ELEVATIONS R AND S NEED NOT BE SHOWN ON THE PLANS IF THE INLET PIPE IS TO ENTER THE MAIN LINE RADIALLY.
   b. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY IF A STUB IS TO BE PROVIDED IN THE MAIN LINE FOR FUTURE CONNECTION OF AN INLET PIPE.
   c. ELEVATION S SHALL BE SHOWN ON THE PLANS IF AN INLET PIPE IS TO ENTER THE MAIN LINE OTHER THAN RADIALLY. INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO THE CATCH BASIN OR GRADE BREAK IN LINE.
6. THE INLET PIPE SHALL ENTER THE MAIN LINE RADIALLY UNLESS OTHERWISE INDICATED. THE INLET PIPE MAY ENTER THE MAIN LINE OTHER THAN RADIALLY IF ANGLE A IS GREATER THAN 45°, B IS LESS THAN OR EQUAL TO 24" (600 mm) AND THE OUTSIDE DIAMETER OF THE INLET PIPE IS LESS THAN 0.5 D: OTHERWISE, SPPWC 340 SHALL BE USED.
7. NO MORE THAN ONE OPENING SHALL BE MADE IN ANY ONE SECTION OF PIPE.
8. THE OPENING FOR THE BREAKOUT SHALL BE RECTANGULAR AND CUT NORMAL TO THE PIPE SURFACE WITHOUT DAMAGING THE REINFORCING STEEL. THE TRANSVERSE REINFORCEMENT OF THE MAIN LINE SHALL BE CUT AT THE CENTER OF THE OPENING AND BENT INTO THE TOP AND BOTTOM SLABS OF THE SPUR.
9. THE MAIN LINE SHALL BE REINFORCED WITH A CONCRETE CRADLE AND ENCASEMENT (AS APPLICABLE). A CONCRETE ENCASEMENT IS REQUIRED IF A JOINT IN THE MAIN LINE FALLS WITHIN THE LIMITS OF THE CRADLE. THE CONCRETE ENCASEMENT SHALL EXTEND 12" (300 mm) ABOVE THE TOP OF THE MAIN LINE AND TO THE LIMITS OF THE CRADLE.
   IF CONNECTING TO AN EXISTING STORM DRAIN, PORTION OF CRADLE OPPOSITE INLET MAY BE OMITTED.
10. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, (ASTM A 615M, GRADE 300), AND BE PLACED 1 1/2" (40 mm) CLEAR FROM CONCRETE SURFACES, UNLESS OTHERWISE SHOWN F BARS SHALL BE CARRIED TO A POINT NOT LESS THAN J DISTANCE FROM CENTER LINE WITH J=7D/12 + 6" (150 mm).
11. FLOOR OF THE SPUR SHALL BE STEEL–TROWELED TO THE SPRING LINE OF THE SPUR.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
JUNCTION STRUCTURE–PIPE TO PIPE INLET ID≥24" (600 mm) OR OD>1/2 MAIN LINE ID	331–3 SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: [signature] 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 15 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14499 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:05pm by: Brent.King

31

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

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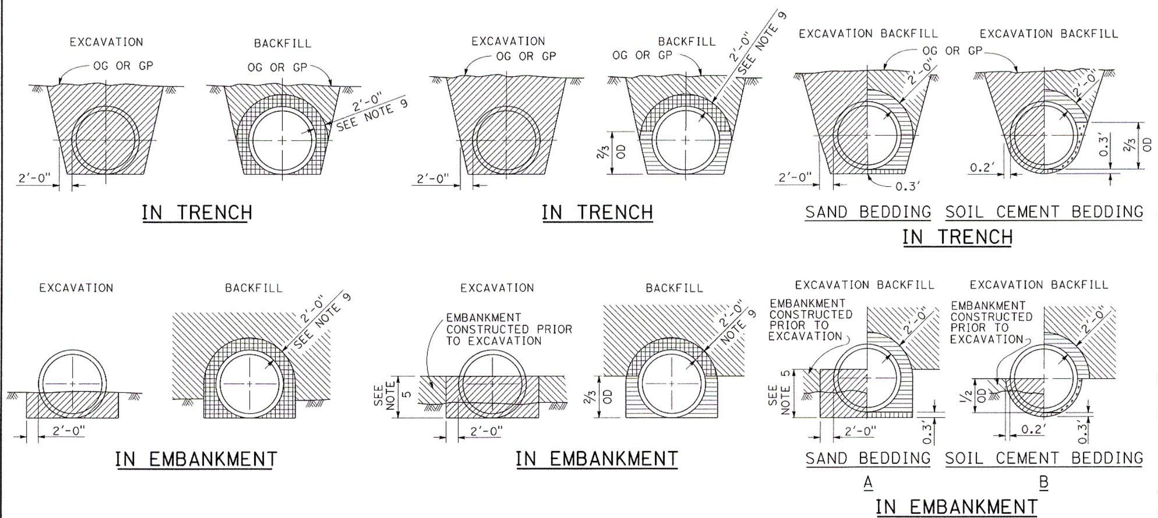


MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 1

COVER	MINIMUM CLASS AND D-LOAD
5.9'	CLASS II 1000D
6.0' - 7.9'	CLASS III 1350D
8.0' - 9.9'	CLASS III SPECIAL 1700D
10.0' - 11.9'	CLASS IV 2000D
12.0' - 13.9'	CLASS IV SPECIAL 2500D
14.0' - 16.9'	CLASS V 3000D
17.0' - 20.0'	CLASS V SPECIAL 3600D

See Notes 6 and 9

METHOD 1

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 2

COVER	MINIMUM CLASS AND D-LOAD
15.9'	CLASS II 1000D
16.0' - 19.9'	CLASS III 1350D
20.0' - 24.9'	CLASS III SPECIAL 1700D
25.0' - 27.9'	CLASS IV 2000D
28.0' - 34.9'	CLASS IV SPECIAL 2500D
35.0' - 41.9'	CLASS V 3000D
42.0' - 50.0'	CLASS V SPECIAL 3600D

See Notes 8 and 9

METHOD 2

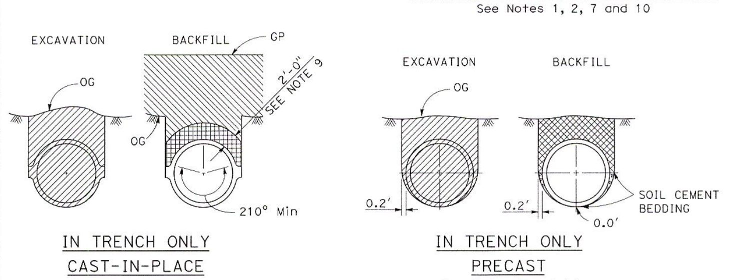
MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 3

COVER	MINIMUM CLASS AND D-LOAD
25.9'	Class II 1000D
26.0' - 31.9'	Class III 1350D
32.0' - 37.9'	Class III Special 1700D
38.0' - 44.9'	Class IV 2000D
45.0' - 55.9'	Class IV Special 2500D
56.0' - 67.9'	Class V 3000D
68.0' - 80.0'	Class V Special 3600D

METHOD 3

REINFORCED CONCRETE PIPE

See Notes 1, 2, 7 and 10



See Notes 7 and 11

NON-REINFORCED CONCRETE PIPE

LEGEND

- STRUCTURE EXCAVATION (CULVERT)
- SAND BEDDING
- STRUCTURE BACKFILL (CULVERT) 95% RELATIVE COMPACTION
- SOIL CEMENT BEDDING
- STRUCTURE BACKFILL (CULVERT) 90% RELATIVE COMPACTION
- ROADWAY EMBANKMENT
- LOOSE BACKFILL

OD = OUTSIDE DIAMETER FOR CIRCULAR PIPES AND MAXIMUM VERTICAL DIMENSION FOR OTHER SHAPES

ID = INSIDE DIAMETER FOR CIRCULAR PIPES AND MINIMUM VERTICAL DIMENSION FOR OTHER SHAPES

NOTES:

1. Unless otherwise shown on the plans or specified in the special provisions, the Contractor shall have the option of selecting the class of RCP and the method of backfill to be used, provided the height of cover does not exceed the value shown for the RCP selected.
   Example:
   2'-0" RCP culvert with maximum cover of 19'-0" the options are:
   a) Class V Special or stronger with Method 1.
   b) Class III or stronger with Method 2.
   c) Class II or stronger with Method 3.
   Cover is defined as the maximum vertical distance from top of pipe to finished grade within the length of any given culvert.
2. The class of RCP, method of backfill and bedding selected shall be the same throughout the length of any given culvert.
3. The "length of any culvert" is defined as the culvert between:
   a) Successive drainage structures (inlets, junction boxes, headwalls, etc.).
   b) A drainage structure and the inlet or outlet end of the culvert.
   c) The inlet and outlet end of the culvert when there are no intervening drainage structures.
4. Slope or shore excavation sides as necessary.
5. Embankment height prior to excavation for installation of all classes of RCP under Methods 2 and 3A shall be as follows:
   Pipe sizes 1'-0" to 3'-6", I D = 2'-6"
   Pipe sizes 4'-0" to 7'-0", I D = 2/3 OD
   Pipe sizes larger than 7'-0", I D = 5'-0"
6. The maximum size for all classes of RCP placed under Method 1 is 6'-6" ID.
7. Non-reinforced precast pipe sizes 3'-0" or smaller may also be placed under Methods 1, 2 or 3.
8. Oval or arch shaped RCP shall be placed under Method 2 only.
9. Embankment compaction requirements govern over the 90% relative compaction backfill requirement within 2'-6" of finished grade.
10. Backfill shall be placed full width of excavation except where dimensions are shown for backfill width or thickness. Dimensions shown are minimums.
11. Where the precast non-reinforced concrete pipe is used as a substitute for the cast-in-place pipe, both the wall thickness and the concrete strength shall be at least as great as that specified for the cast-in-place pipe. The fill height allowed shall not exceed that shown for the cast-in-place pipe.

2018 STANDARD PLAN A62D

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

EXCAVATION AND BACKFILL CONCRETE PIPE CULVERTS

NO SCALE

A62D

1-26-18

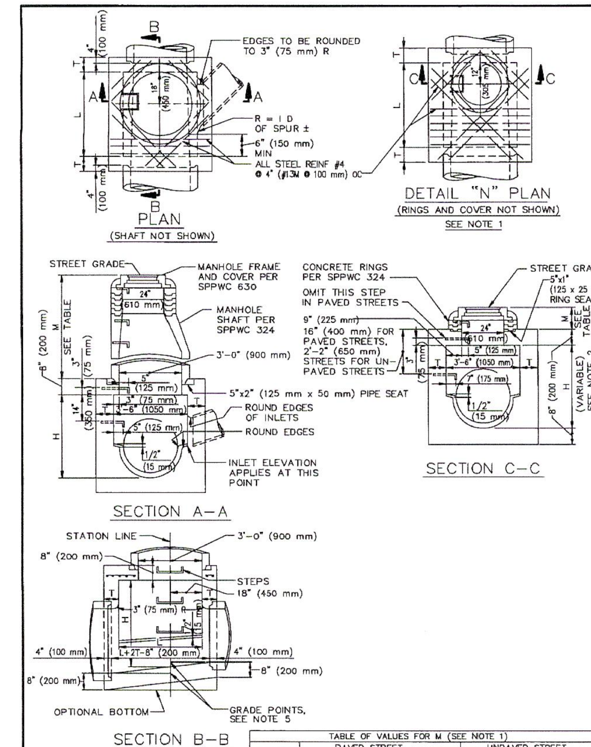


TABLE OF VALUES FOR M (SEE NOTE 1)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN	MAX	MIN
A-A		2'-10 1/2" (867 mm)		3'-6" (1060 mm)
C-C	11" (282 mm)	8 1/2" (217 mm)	16" (410 mm)	15" (380 mm)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1998, 2009

MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS 33" (825 mm) OR SMALLER)

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 321-2 SHEET 1 OF 3

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" (867 mm) FOR PAVED STREETS OR 3'-6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT SHAFT PER SECTION C-C AND DETAIL "N". DEPTH M MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6" (150 mm) WHEN LARGER VALUES OF M WOULD REDUCE H IN SECTION C-C TO 3'-6" (1060 mm) OR LESS.
2. H (IN SECTION A-A AND B-B) SHALL NOT BE LESS THAN 4'-0" (1.2 m), BUT MAY BE INCREASED PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SECTION C-C) SEE NOTE 1.
3. L SHALL BE 4'-0" (1.2 m) UNLESS OTHERWISE SHOWN. L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF THE SPUR MUST BE APPROVED BY THE ENGINEER.
4. T SHALL BE 8" (200 mm) FOR VALUES OF H UP TO AND INCLUDING 8'-0" (2.4 m) AND 10" (250 mm) FOR VALUES OF H OVER 8'-0" (2.4 m).
5. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES. SEE NOTE 3.
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN 8" (200 mm).
10. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE LEDGE AT THE SIDE OF THE MANHOLE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS = 33" (825 mm) OR SMALLER)

STANDARD PLAN 321-2 SHEET 2 OF 3

811 Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY:
CITY ENGINEER 8/8/22 DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO

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DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
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REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 16 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 59493D

D 14500 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
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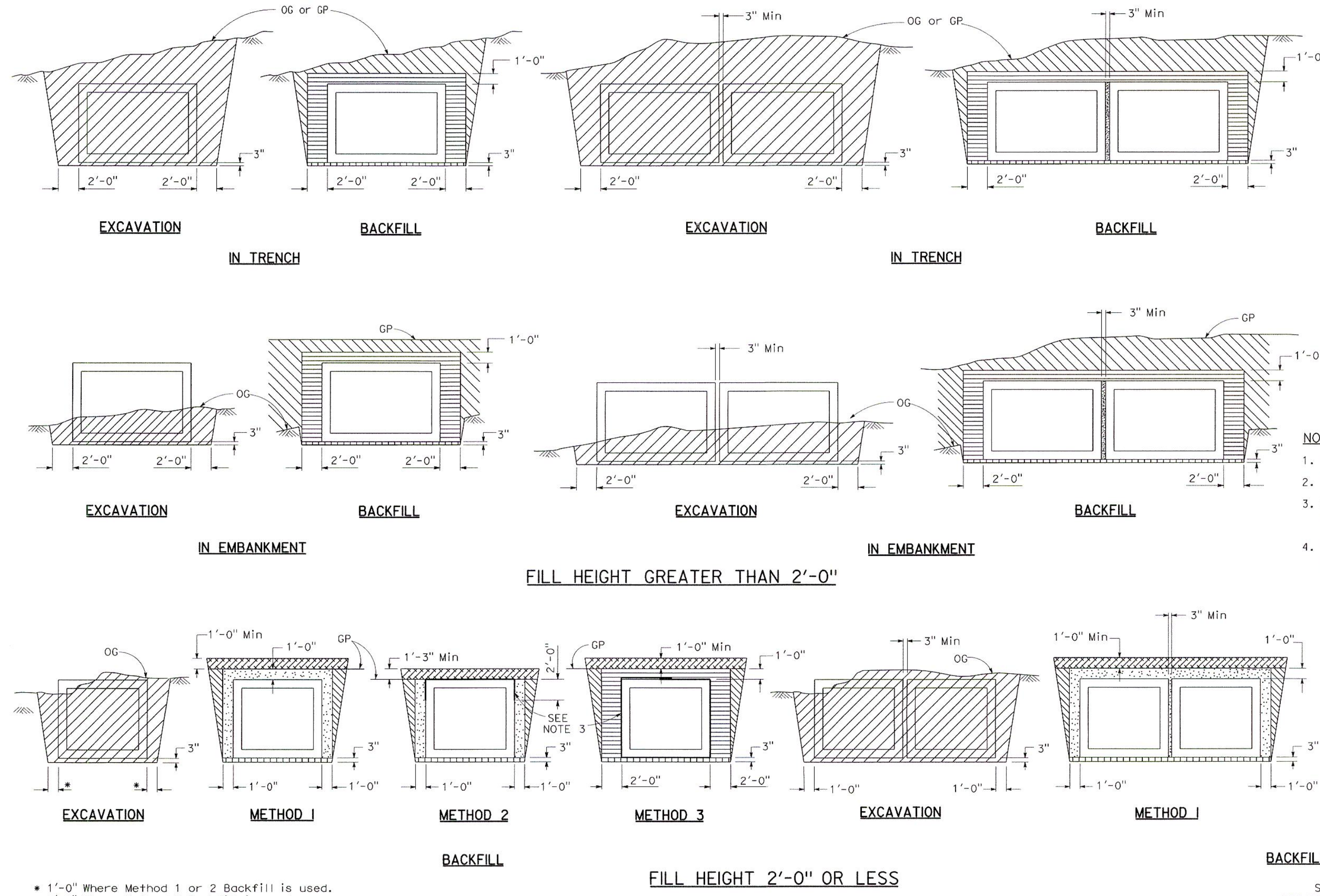

* 1'-0" Where Method 1 or 2 Backfill is used.
2'-0" Where Method 3 Backfill is used.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

Carl W. Duan C59976 Exp. 6-30-18 CIVIL

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LEGEND:

- STRUCTURE EXCAVATION (CULVERT)
- STRUCTURE BACKFILL (CULVERT) 95% RELATIVE COMPACTION
- ROADWAY EMBANKMENT
- SLURRY CEMENT BACKFILL
- SAND BEDDING (CULVERT)
- ROADWAY PAVEMENT STRUCTURE

NOTES:

1. Slope or shore excavation sides as necessary.
2. Dimensions shown are minimum.
3. Method 2 and 3 for single or multiple boxes requires an approved external sealing band. See Standard Plan D83A.
4. Construction of Roadway Pavement Structure in Method 2 or Method 3 shall not disturb the external sealing band installation.

2018 STANDARD PLAN A62G

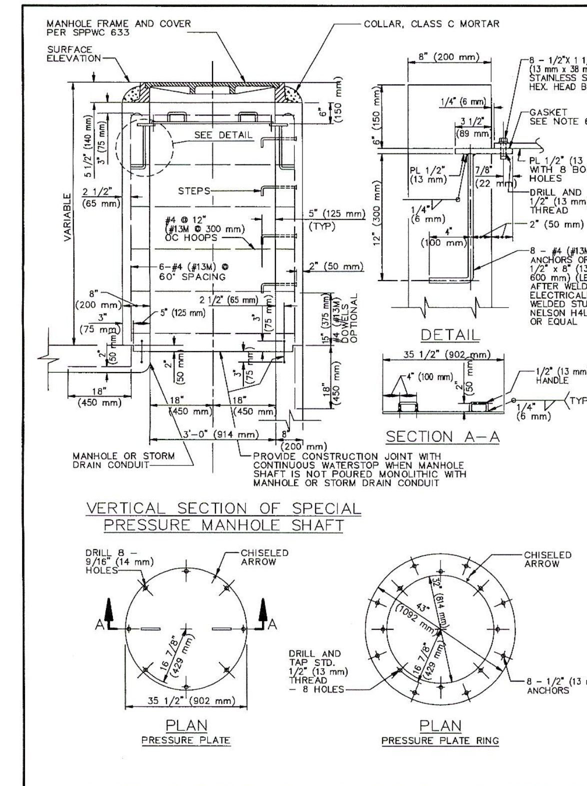
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

EXCAVATION AND BACKFILL PRECAST REINFORCED CONCRETE BOX CULVERT

NO SCALE

A62G

35



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

PRESSURE MANHOLE SHAFT AND PRESSURE PLATE DETAIL 36" (914 mm) WITHOUT REDUCER

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 329-2 SHEET 1 OF 2

NOTES

1. THIS STRUCTURE MAY BE USED FOR HYDROSTATIC HEADS UP TO 25' (7.5 m) ABOVE THE PRESSURE PLATE.
2. 36" (914 mm) MANHOLE FRAME AND COVER PER SPPWC 633 SHALL BE USED.
3. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. HOOPS MAY BE ELECTRICALLY BUTT WELDED OR THE ENDS LAPPED 18" (450 mm).
4. THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE CONDUIT BELOW.
5. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC.
6. GASKET MATERIAL SHALL BE NEOPRENE (OR EQUAL) 1/16" (2 mm) THICK BY 1 1/4" (32 mm) WIDE.
7. BOLTS SHALL BE STAINLESS STEEL CONFORMING TO ASTM A 320 (ASTM A 320M), GRADE B8.
8. PRESSURE PLATE AND PRESSURE PLATE RING SHALL BE STEEL CONFORMING TO ASTM A 36 (ASTM A 36M) AND SHALL BE GALVANIZED. PLATES SHALL BE MARKED IN SETS AND A CHISELED ARROW STAMPED ON BOTH PLATES, AFTER DRILLING AND TAPPING, TO FACILITATE FIELD ASSEMBLY.
9. SEE CONTRACT SPECIFICATIONS FOR PHYSICAL REQUIREMENTS OF WATERSTOP.
10. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

633 36" (914 mm) MANHOLE FRAME AND COVER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PRESSURE MANHOLE SHAFT AND PRESSURE PLATE DETAIL 36" (914mm) WITHOUT REDUCER

STANDARD PLAN 329-2 SHEET 2 OF 2

Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: _______ 8/8/2
CITY ENGINEER DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 17 OF 21
CONTRACT ______
ACCOUNT ______
DWG. NO. AA 5949 SD

D14501 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King

222

SPAN, S		4'						5'							
HEIGHT, H		2'		3'		4'		2'		3'		4'		5'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc	ROOF T_1	7"	7½"	7"	7½"	7"	7½"	7"	9"	7"	9"	7"	9"	7"	9"
Conc	WALLS T_2	6"	6½"	6½"	7"	7"	8"	6"	6½"	6½"	7½"	7½"	8"	8"	9½"
Conc	INVERT T_3	7"	7½"	7"	7½"	7"	7½"	7½"	9"	7½"	9"	8"	9"	8"	9"
Reinf	SPACING	12"	12"	12"	12"	12"	12"	11½"	12"	11½"	12"	11½"	12"	11½"	12"
Reinf	"g" SIZE BAR	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7
Reinf	"f" SIZE BAR	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5
Reinf	"a" SIZE BAR	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf	"e" SIZE BAR	#4	#4	#4	#5	#5	#6	#4	#4	#4	#5	#5	#6	#5	#7
QUANTITIES	CONCRETE CF/LF	14.1	15.1	15.9	17.1	17.9	19.6	16.9	20.5	18.8	22.9	21.7	25.1	24.0	28.5
QUANTITIES	REINFORCEMENT LB/LF	109	109	115	122	130	141	133	130	139	145	156	164	163	192
** SOIL PRESSURE (ksf)		2.1	4.1	2.2	4.1	2.2	4.1	3.2	4.1	3.2	4.1	3.2	4.1	3.3	4.2

SPAN, S		6'								7'									
HEIGHT, H		3'		4'		5'		6'		3'		4'		5'		6'		7'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc	ROOF T_1	7"	10½"	7"	10½"	7"	10½"	7"	10½"	7½"	11½"	7½"	11½"	7½"	11½"	7½"	11½"	8"	11½"
Conc	WALLS T_2	6½"	7½"	7"	8½"	7½"	10"	8½"	11"	6½"	7½"	7½"	8"	7½"	9½"	8½"	11"	9½"	13"
Conc	INVERT T_3	8½"	10½"	8½"	10½"	8½"	10½"	8½"	10½"	9½"	12"	9½"	12"	9½"	12"	9½"	12"	9½"	12"
Reinf	SPACING	11½"	12"	11½"	12"	11½"	12"	11½"	12"	11"	10½"	11"	10½"	11"	10½"	11"	10½"	11"	10½"
Reinf	"g" SIZE BAR	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7
Reinf	"f" SIZE BAR	#5	#5	#5	#5	#5	#6	#5	#6	#6	#5	#6	#5	#6	#6	#6	#6	#6	#6
Reinf	"a" SIZE BAR	#7	#4	#7	#4	#7	#4	#7	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf	"e" SIZE BAR	#4	#5	#5	#6	#6	#6	#6	#7	#4	#5	#5	#6	#6	#6	#6	#7	#6	#7
QUANTITIES	CONCRETE CF/LF	22.3	29.3	24.3	32.0	26.5	35.6	29.5	38.5	26.8	36.1	29.3	38.3	31.1	41.9	34.0	46.0	38.0	51.3
QUANTITIES	REINFORCEMENT LB/LF	202	167	218	188	239	213	250	243	237	209	254	232	275	262	287	298	299	317
** SOIL PRESSURE (ksf)		3.1	4.1	3.1	4.2	3.1	4.2	3.1	4.2	3.0	4.1	3.0	4.2	3.0	4.2	3.0	4.2	3.1	4.3

SPAN, S		8'									
HEIGHT, H		4'		5'		6'		7'		8'	
MAXIMUM EARTH COVER		10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc	ROOF T_1	8½"	13"	8½"	13"	8½"	13"	8½"	13"	8½"	13"
Conc	WALLS T_2	6½"	8"	7½"	9½"	8½"	11½"	9½"	13"	11"	15"
Conc	INVERT T_3	10½"	13½"	10½"	13½"	10½"	13½"	10½"	13½"	10½"	13½"
Reinf	SPACING	9"	10"	9"	10"	9"	10"	9"	10"	9"	10"
Reinf	"g" SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf	"f" SIZE BAR	#5	#6	#5	#6	#5	#6	#5	#6	#5	#6
Reinf	"a" SIZE BAR	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf	"e" SIZE BAR	#5	#6	#5	#6	#6	#6	#6	#7	#6	#7
QUANTITIES	CONCRETE CF/LF	34.2	46.7	36.9	50.4	39.9	55.2	43.2	59.9	47.7	66.0
QUANTITIES	REINFORCEMENT LB/LF	334	287	345	301	376	317	390	359	406	378
** SOIL PRESSURE (ksf)		2.9	4.2	2.9	4.2	3.0	4.3	3.0	4.3	3.0	4.4

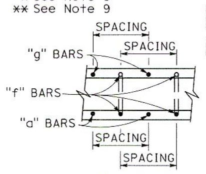
SPAN, S			10'											
HEIGHT, H			5'		6'		7'		8'		9'		10'	
MAXIMUM EARTH COVER			10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc	ROOF	T_1	10½"	15½"	10½"	15½"	10½"	15½"	10½"	15½"	10½"	15½"	10½"	15½"
Conc	WALLS	T_2	8½"	8½"	8½"	9½"	8½"	10½"	9"	12"	10"	13½"	11"	15"
Conc	INVERT	T_3	10½"	16"	10½"	16"	10½"	16"	10½"	16"	10½"	16"	10½"	16"
Reinf	SPACING		11"	7½"	10½"	7½"	10"	8"	10"	8"	10½"	8"	10½"	8½"
Reinf	"g"	SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf	"f"	SIZE BAR	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6
Reinf	"a"	SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5
Reinf	"b"	SIZE BAR	#5	#5	#4	#5	#5	#5	#6	#5	#6	#6	#6	#6
Reinf	"b"	Dim "B" ft-inch	1-9	2-7	2-0	2-9	2-3	2-9	2-7	3-1	2-7	3-1	2-7	3-1
Reinf	"b"	Dim "Bw" ft-inch	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11
Reinf	"c"	SIZE BAR	#5	#6	#6	#6	#6	#6	#6	#6	#7	#6	#7	#6
Reinf	"c"	Dim "C" ft-inch	3-1	2-9	3-9	3-3	4-6	4-3	5-6	4-6	6-0	4-9	6-0	4-9
Reinf	* "e"	SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5
QUANTITIES	CONCRETE	CF/LF	49.1	68.4	51.1	71.9	53.2	75.8	56.1	80.8	60.1	86.4	64.4	92.5
QUANTITIES	REINFORCEMENT	LB/LF	393	520	427	542	473	538	509	559	534	599	568	636
** SOIL PRESSURE (ksf)			2.8	4.8	2.8	4.9	2.9	4.9	2.9	4.9	2.9	4.9	2.9	5.0

SPAN, S			12'													
HEIGHT, H			6'		7'		8'		9'		10'		11'		12'	
MAXIMUM EARTH COVER			10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc	ROOF	T_1	11½"	18"	11½"	18"	11½"	18"	11½"	18"	11½"	18"	11½"	18"	11½"	18"
Conc	WALLS	T_2	8½"	9½"	8½"	10½"	9"	12"	10"	13½"	11"	15"	12½"	16½"	13½"	18½"
Conc	INVERT	T_3	12"	19"	12"	19"	12"	19"	12"	19"	12"	19"	12"	19"	12"	19"
Reinf	SPACING		9"	8"	9"	8"	8"	7½"	8"	7½"	8½"	7½"	8½"	8"	8½"	8"
Reinf	"g"	SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf	"f"	SIZE BAR	#7	#8	#7	#8	#7	#7	#7	#7	#7	#7	#7	#8	#7	#8
Reinf	"a"	SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf	"b"	SIZE BAR	#5	#6	#5	#6	#6	#6	#6	#6	#6	#6	#5	#6	#6	#6
Reinf	"b"	Dim "B" ft-inch	2-7	3-1	3-0	3-2	3-6	3-2	3-6	3-4	3-9	3-4	3-9	3-4	3-9	3-4
Reinf	"b"	Dim "Bw" ft-inch	4-1	3-2	4-1	3-4	4-1	3-4	4-1	3-7	3-9	3-7	3-9	3-7	3-7	3-7
Reinf	"c"	SIZE BAR	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7
Reinf	"c"	Dim "C" ft-inch	3-10	3-7	4-6	4-4	5-7	5-0	6-6	5-2	7-2	5-4	7-5	5-7	7-5	5-7
Reinf	* "e"	SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5
QUANTITIES	CONCRETE	CF/LF	63.6	94.4	65.7	98.4	68.6	104	72.6	109	76.9	115	82.6	122	87.7	131
QUANTITIES	REINFORCEMENT	LB/LF	563	686	584	711	691	721	715	745	700	764	767	867	804	890
** SOIL PRESSURE (ksf)			2.8	4.8	2.8	4.9	2.8	4.9	2.8	4.9	2.8	4.9	2.9	5.0	2.9	5.0

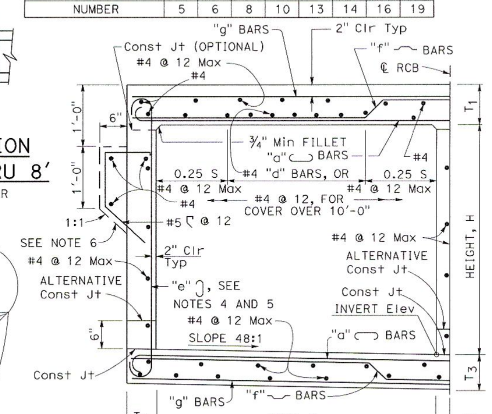
SPAN, S			14'															
HEIGHT, H			7'		8'		9'		10'		11'		12'		13'		14'	
MAXIMUM EARTH COVER			10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc	ROOF	T_1	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"
Conc	WALLS	T_2	9"	11"	9"	12"	10"	13½"	11½"	15"	12½"	17"	13½"	18½"	15"	20"	16½"	22"
Conc	INVERT	T_3	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"
Reinf	SPACING		8½"	8"	8½"	8"	8½"	8"	8½"	8"	8½"	8"	8½"	8"	9"	8"	9"	8"
Reinf	"g"	SIZE BAR	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8
Reinf	"f"	SIZE BAR	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8
Reinf	"a"	SIZE BAR	#4	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf	"b"	SIZE BAR	#5	#6	#6	#6	#5	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7
Reinf	"b"	Dim "B" ft-inch	2-7	2-7	3-3	3-3	4-0	4-0	4-0	4-0	4-7	4-4	4-7	4-11	5-3	4-11	5-3	4-11
Reinf	"b"	Dim "Bw" ft-inch	5-0	3-9	5-0	4-6	5-0	5-0	5-0	5-0	4-9	5-6	4-9	6-2	5-2	6-2	5-2	6-2
Reinf	"c"	SIZE BAR	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8
Reinf	"c"	Dim "C" ft-inch	4-3	3-11	5-6	5-2	7-9	5-8	8-6	6-5	8-10	6-6	9-0	6-10	9-3	6-10	9-3	6-10
Reinf	* "e"	SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5	#6	#6
QUANTITIES	CONCRETE	CF/LF	88.8	124	84.0	129	88.0	134	93.4	141	98	149	103	156	110	164	117	174
QUANTITIES	REINFORCEMENT	LB/LF	734	878	785	919	842	956	892	985	916	1015	964	1120	980	1141	1095	1269
** SOIL PRESSURE (ksf)			2.8	4.8	2.8	4.9	2.8	4.9	2.8	4.9	2.8	5.0	2.9	5.0	2.9	5.0	2.9	5.1

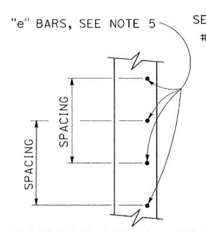
* See Note 5
** See Note 9

"d" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10'-0"								
SPAN	4'	5'	6'	7'	8'	10'	12'	14'
NUMBER	5	6	8	10	13	14	16	19



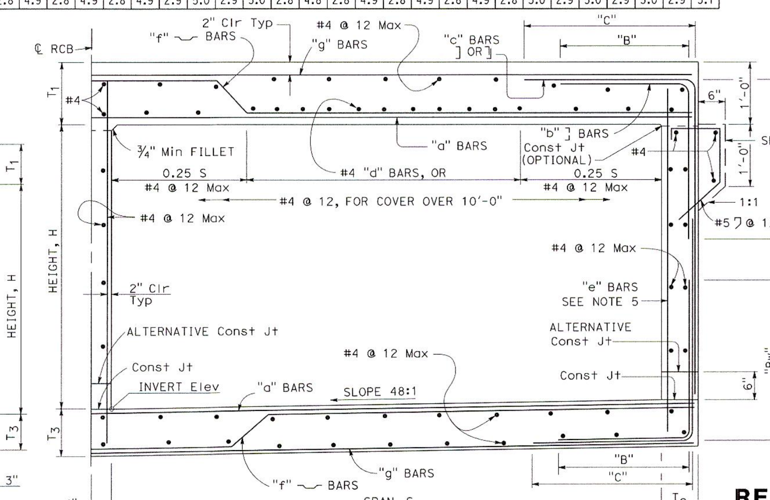
ROOF SECTION
SPANS 4' THRU 8'
INVERT SIMILAR





EXTERIOR WALL SECTION
SPANS 4' THRU 8'

TYPICAL SECTION
SPANS 4' THRU 8'



TYPICAL SECTION
SPANS 10' THRU 14'

NOTES:

1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. For boxes with span or height or cover greater than those shown in tables, a special design is required.
3. Quantities are approximate and for design purposes only.
4. It is permissible to eliminate the 180° hooks on every other "e" bar.
5. "e" bars are at half spacing.
6. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
7. For design and details not shown, see Standard Plan D82.
8. This plan sheet may be used for multiple cell culverts by making necessary adjustments.
9. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

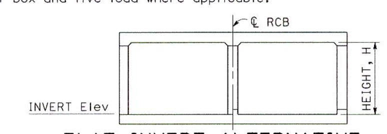
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

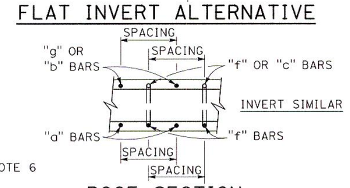
May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Carl M. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

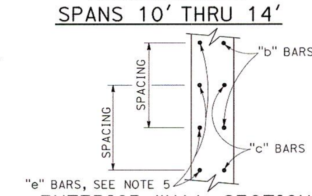
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



FLAT INVERT ALTERNATIVE



ROOF SECTION
SPANS 10' THRU 14'



EXTERIOR WALL SECTION
SPANS 10' THRU 14'

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE DOUBLE BOX CULVERT

NO SCALE

D81

2018 STANDARD PLAN D81

1-29-18

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT SURVEY GRID
TR-0151 (REV. 09/2006)

LEGEND:

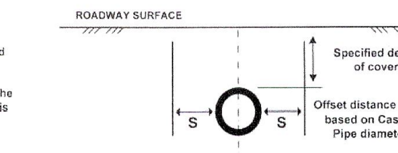
- ○ Octagon Data Points required when the diameter is < 8'.
- △ Octagon & Triangle Data Points required when the diameter is > 8'.
- ☆ Settlement Rod may be required when the diameter is > 5'. (Settlement Rod Detail is located in Appendix E of the Encroachment Permits Manual)

EP Edge of Pavement
ETW Edge of Travel Way (Fog line, Yellow Stripe, etc.)
S Offset Distance away from the pipe alignment, as follows:
3' for casing pipe diameters < 30"
5' for casing pipe diameters 30" - 72"
10' for casing pipe diameters 72" - 108"
15' for casing pipe diameters > 108"

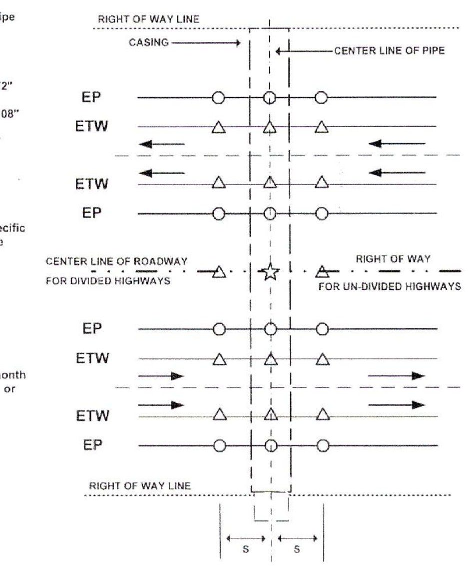
NOTES:

Survey data is to be collected at the specific points along the casing alignment at the following times:

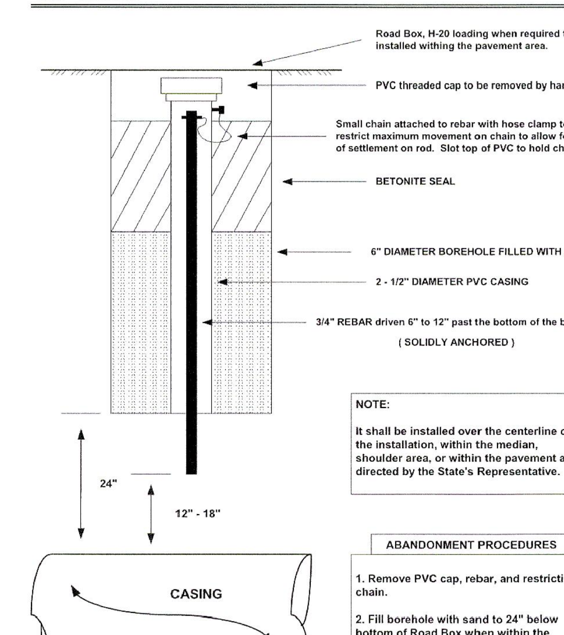
1. Prior to Start of Work.
2. Every two (2) hours continuously throughout the project.
3. Upon completion of the project.
4. Every two (2) months, during a six month period after the date of completion, and or As Required by the Department.



PROFILE



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT SETTLEMENT ROD DETAIL
TR-0152 (REV. 09/2006)



NOTE:
It shall be installed over the centerline of the installation, within the median, shoulder area, or within the pavement as directed by the State's Representative.

ABANDONMENT PROCEDURES

1. Remove PVC cap, rebar, and restriction chain.
2. Fill borehole with sand to 24" below bottom of Road Box when within the median or shoulder areas.
3. Fill remainder of borehole with Bentonite seal mixture.
4. Remove Road Box and back fill with an approved backfill.

CONTINGENCY PLAN
(DEFORMATION LIMITS AND CORRECTIVE ACTION)

A. DEFORMATION LIMITS IDENTIFIED HEREIN AS THRESHOLD VALUES, CONTRACTOR CORRECTIVE ACTION VALUES, AND PROJECT SHUTDOWN VALUES FOR VARIOUS FEATURES BEING MONITORED ARE PROVIDED IN TABLE 1, RESPONSE VALUES OF MEASURED DEFORMATION.
B. CONTRACTOR'S CORRECTIVE ACTIONS, AS REQUIRED HEREIN, SHALL BE APPROVED BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.
C. WHEN ANY OF THOSE ESTABLISHED MONITORING POINT'S MEASUREMENT INDICATES MOVEMENT EQUALS TO 50 PERCENT OF THE SHUTDOWN VALUE HAS OCCURRED, THE THRESHOLD VALUE IS SAID TO HAVE BEEN REACHED. AT THIS TIME, THE CONTRACTOR SHALL MEET WITH THE DEPARTMENT TO DISCUSS HIS/HER CONSTRUCTION MEANS AND METHODS TO DETERMINE WHAT CHANGES, IF ANY, SHALL BE MADE TO BETTER CONTROL GROUND MOVEMENT AND PREVENT DEFORMATION OF MONITORED FEATURES. MEASUREMENTS SHALL BE REQUIRED EVERY 2-HOURS, UNLESS MORE STRINGENTLY SPECIFIED, UNTIL FIVE CONSECUTIVE WORKING DAYS OF READINGS OBSERVED BEING BELOW THE THRESHOLD VALUE.
D. WHEN ANY OF THOSE ESTABLISHED MONITORING POINT'S MEASUREMENT INDICATES MOVEMENT EQUALS TO 75 PERCENT OF THE SHUTDOWN VALUE HAS OCCURRED, CONTRACTORS CORRECTIVE ACTION VALUE IS SAID TO HAVE BEEN REACHED. AT THIS TIME, THE CONTRACTOR SHALL ACTIVELY CONTROL GROUND MOVEMENT IN ACCORDANCE WITH THE APPROVED PLAN TO PREVENT DEFORMATION BEYOND THE CONTRACTOR CORRECTIVE ACTION VALUE. MEASUREMENTS SHALL BE REQUIRED EVERY 2-HOURS, UNLESS MORE STRINGENTLY SPECIFIED, UNTIL FIVE CONSECUTIVE WORKING DAYS OF READINGS OBSERVED BEING BELOW THE THRESHOLD VALUE.
E. WHEN ANY OF THOSE ESTABLISHED MONITORING POINT'S MEASUREMENT INDICATES MOVEMENT EQUALS TO 100 PERCENT OF THE SHUTDOWN VALUE HAS OCCURRED, THE SHUTDOWN VALUE IS SAID TO HAVE BEEN REACHED. AT THIS TIME, THE CONTRACTOR SHALL STOP ALL EXCAVATION WORK IMMEDIATELY, AND SHALL CONTINUE IMPLEMENTING MEASURES TO PREVENT FURTHER DEFORMATIONS, AND SHALL MEET THE DEPARTMENT TO DEVELOP A PLAN OF ACTION BEFORE EXCAVATION WORK CAN BE RESUMED.

PROTECTION AND PLACEMENT

A. ALL INSTRUMENTS AND INSTRUMENTATION POINTS SHALL BE PROTECTED FROM DAMAGE.
B. ALL INSTRUMENTS AND INSTRUMENTATION POINT DAMAGE RESULTING FROM CONSTRUCTION OPERATIONS, WEATHER, TRAFFIC, OR VANDALISM SHALL BE REPAIRED OR REPLACED AND RE-INSTALLED AT NO ADDITIONAL COST PRIOR TO CONTINUING TUNNELING, OR AS REQUIRED BY THE DEPARTMENT.

TABLE 1 - RESPONSE VALUES OF MEASURED DEFORMATION

INSTRUMENTATION DEVISE	MONITORED FEATURE	THRESHOLD VALUE (FEET)	CONTRACTOR CORRECTIVE ACTION VALUE (FEET)	SHUTDOWN VALUE (FEET)
TOTAL MOVEMENT OF INDIVIDUAL SETTLEMENT MONUMENTS	ROADWAY (SR-83 BETWEEN PM 3.92-4.42	0.01	0.015	0.02

811 Know what's below. Call 811 before you dig.

CITY OF CHINO
RECOMMENDED BY: 8/8/22
CITY ENGINEER DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK
DATE: 04/26/2022
DRAWN BY: PK/BK
DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

SHEET 18 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 8D

D11502 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King

2018 STANDARD PLAN D80

Span 4' and 5'

SPAN, S	4'						5'							
HEIGHT, H	2'		3'		4'		2'		3'		4'		5'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	7"	7½"	7"	7½"	7"	7½"	7½"	8"	7½"	8"	7½"	8"	7½"	8"
Conc WALLS T_2	6"	6"	6½"	6½"	7"	7½"	6"	6"	6½"	6½"	7"	7"	6½"	8"
Conc INVERT T_3	7"	7½"	7"	7½"	7"	7½"	7½"	8"	7½"	8"	7½"	8"	7½"	8"
Reinf SPACING	7"	6"	7"	6"	7"	6"	8½"	6"	8½"	5½"	8"	5½"	8"	5"
Reinf "a" SIZE BAR	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#6
Reinf "e" SIZE BAR	#4	#4	#5	#6	#5	#6	#4	#4	#5	#5	#5	#6	#6	#6
QUANTITIES CONCRETE CF/LF	7.8	8.3	9.2	9.6	10.7	11.6	9.5	10.0	10.9	11.4	12.4	12.9	14.1	15.1
QUANTITIES REINFORCEMENT LB/LF	47.7	51.1	57.8	71.4	63.5	80.8	57.8	73.7	66.6	92.5	83.0	111	101	114
*** SOIL PRESSURE (ksf)	2.4	4.5	2.4	4.5	2.5	4.6	2.4	4.5	2.4	4.5	2.5	4.6	2.5	4.6

Span 6'

SPAN, S	6'							
HEIGHT, H	3'		4'		5'		6'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8"	9"	8"	9"	8"	9"	8"	9"
Conc WALLS T_2	7"	7"	7"	7"	7½"	8"	8"	9½"
Conc INVERT T_3	8"	9"	8"	9"	8"	9½"	8"	9½"
Reinf SPACING	7½"	5"	7½"	5"	7"	5"	7"	4½"
Reinf "a" SIZE BAR	#7	#6	#7	#6	#7	#6	#7	#6
Reinf "e" SIZE BAR	#4	#5	#6	#6	#6	#6	#7	#6
QUANTITIES CONCRETE CF/LF	13.1	14.3	14.2	15.4	15.9	18.0	17.8	21.2
QUANTITIES REINFORCEMENT LB/LF	77.6	94.7	96.6	114	110	126	132	152
*** SOIL PRESSURE (ksf)	2.4	4.6	2.5	4.6	2.5	4.6	2.5	4.7

Span 7'

SPAN, S	7'									
HEIGHT, H	3'		4'		5'		6'		7'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8"	10"	8"	10"	8"	10½"	8½"	10½"	8½"	10½"
Conc WALLS T_2	6½"	7"	6½"	7½"	7"	8"	7½"	9½"	8½"	11"
Conc INVERT T_3	8"	10½"	8"	10½"	8"	10½"	8"	10½"	8½"	10½"
Reinf SPACING	6"	4½"	6"	4½"	6"	5½"	6"	5½"	6"	5½"
Reinf "a" SIZE BAR	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7
Reinf "e" SIZE BAR	#4	#4	#5	#5	#6	#7	#7	#7	#7	#7
QUANTITIES CONCRETE CF/LF	14.0	17.5	15.1	19.1	16.7	21.3	18.8	24.5	21.8	28.3
QUANTITIES REINFORCEMENT LB/LF	102	106	115	124	134	166	160	181	173	196
*** SOIL PRESSURE (ksf)	2.4	4.6	2.4	4.6	2.5	4.7	2.5	4.7	2.6	4.8

Span 8'

SPAN, S	8'									
HEIGHT, H	4'		5'		6'		7'		8'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8½"	11½"	8½"	11½"	8½"	11½"	8½"	11½"	8½"	11½"
Conc WALLS T_2	6½"	7½"	7"	8½"	7½"	9½"	8½"	11"	9"	12½"
Conc INVERT T_3	8½"	11½"	8½"	11½"	8½"	12"	8½"	12"	8½"	12"
Reinf SPACING	5½"	5"	5½"	5"	6"	4½"	5½"	4½"	5½"	4½"
Reinf "a" SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "e" SIZE BAR	#5	#6	#6	#6	#7	#6	#7	#7	#7	#7
QUANTITIES CONCRETE CF/LF	17.2	22.7	18.8	25.1	20.6	28.3	23.3	32.1	25.5	36.4
QUANTITIES REINFORCEMENT LB/LF	135	166	156	177	184	208	197	252	209	269
*** SOIL PRESSURE (ksf)	2.4	4.6	2.5	4.7	2.5	4.7	2.6	4.8	2.6	4.9

"d" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10'-0"								
SPAN	4'	5'	6'	7'	8'	10'	12'	14'
NUMBER	7	8	9	10	11	12	15	20

Span 10'

SPAN, S	10'											
HEIGHT, H	5'		6'		7'		8'		9'		10'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	9½"	12"	9½"	12"	9½"	12"	9½"	12"	9½"	12"	9½"	12"
Conc WALLS T_2	8½"	8½"	8½"	9½"	9"	10½"	9"	12"	10"	13½"	11"	15"
Conc INVERT T_3	10"	12½"	10"	12½"	10"	12½"	10"	13"	10"	13"	10"	13"
Reinf SPACING	11"	12"	12"	12"	11"	11"	10"	11"	10"	10"	11"	10"
Reinf **"a" SIZE BAR	#7	#8	#7	#8	#7	#7	#6	#7	#6	#7	#7	#7
Reinf "b" SIZE BAR	#7	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7
Reinf "b" DIMENSION "B" ft-inch	2-11	2-11	2-11	3-0	2-11	3-9	2-11	3-9	2-11	3-9	2-11	3-9
Reinf "b" DIMENSION "Bw" ft-inch	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-7	4-7
Reinf "c" SIZE BAR #	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7
Reinf "c" DIMENSION "C" ft-inch	3-4	3-6	7-4	4-8	7-7	4-8	8-2	4-8	7-7	5-2	7-7	5-11
Reinf *"e" SIZE BAR	#4	#4	#4	#5	#6	#6	#6	#7	#7	#7	#8	#8
QUANTITIES CONCRETE CF/LF	25.1	30.4	27.1	33.1	29.2	36.2	30.7	41	34	45.8	37.6	51
QUANTITIES REINFORCEMENT LB/LF	271	296	278	333	341	366	359	406	428	469	487	530
*** SOIL PRESSURE (ksf)	3.7	4.7	3.8	4.7	3.8	4.8	3.8	4.8	3.9	4.9	3.9	5.0

Span 12'

SPAN, S	12'													
HEIGHT, H	6'		7'		8'		9'		10'		11'		12'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"
Conc WALLS T_2	9"	10½"	9"	10½"	9½"	12"	10"	13½"	11"	15"	12½"	16½"	13½"	18"
Conc INVERT T_3	11"	14½"	11"	15"	11"	15"	11"	15"	11½"	15"	11½"	15½"	11½"	15½"
Reinf SPACING	9"	10"	9"	10"	9"	10"	8"	10"	8"	10"	10"	9"	9"	8"
Reinf **"a" SIZE BAR	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#6	#6
Reinf "b" SIZE BAR	#6	#7	#6	#7	#6	#7	#6	#8	#7	#8	#7	#8	#6	#7
Reinf "b" DIMENSION "B" ft-inch	3-1	3-2	3-9	3-9	3-9	3-9	3-7	3-9	3-7	4-4	3-7	4-4	4-4	4-4
Reinf "b" DIMENSION "Bw" ft-inch	6-0	5-10	6-2	6-7	6-2	6-7	4-11	4-11	4-11	4-11	4-11	4-11	4-4	4-4
Reinf "c" SIZE BAR #	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7
Reinf "c" DIMENSION "C" ft-inch	4-4	3-10	8-1	5-7	8-1	5-7	8-1	5-7	8-1	5-7	8-1	6-4	8-1	6-10
Reinf *"e" SIZE BAR	#4	#4	#4	#4	#4	#5	#4	#5	#5	#5	#6	#6	#6	#6
QUANTITIES CONCRETE CF/LF	33.2	43.7	34.7	46.1	37	50.4	39.5	55.3	43.7	60.6	48.7	67.1	53.1	73.5
QUANTITIES REINFORCEMENT LB/LF	322	371	379	417	390	449	430	477	499	500	527	610	530	614
*** SOIL PRESSURE (ksf)	3.6	4.8	3.6	4.8	3.6	4.9	3.6	4.9	3.7	5.0	3.7	5.0	3.8	5.1

Span 14'

SPAN, S	14'															
HEIGHT, H	7'		8'		9'		10'		11'		12'		13'		14'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"
Conc WALLS T_2	9½"	11"	9½"	12"	10"	13½"	11½"	15"	12½"	16½"	13½"	18"	15"	19½"	16½"	21½"
Conc INVERT T_3	12½"	17"	12½"	17"	12½"	17"	12½"	17½"	12½"	17½"	13"	17½"	13"	18"	13"	18"
Reinf SPACING	10"	9"	10"	9"	10"	8"	10"	8"	9"	8"	8"	10"	10"	10"	10"	9"
Reinf **"a" SIZE BAR	#7	#8	#7	#8	#7	#7	#7	#7	#7	#7	#6	#8	#7	#7	#7	#7
Reinf "b" SIZE BAR	#7	#7	#7	#7	#7	#7	#8	#7	#8	#7	#7	#8	#7	#8	#8	#8
Reinf "b" DIMENSION "B" ft-inch	2-9	4-2	3-4	4-4	3-4	4-6	3-5	4-6	3-6	4-6	3-6	4-6	3-6	4-6	4-9	6-0
Reinf "b" DIMENSION "Bw" ft-inch	6-5	7-0	7-0	8-4	7-0	8-4	6-0	6-0	6-0	6-0	6-0	6-0	5-0	6-0	4-6	6-0
Reinf "c" SIZE BAR #	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8
Reinf "c" DIMENSION "C" ft-inch	4-3	4-2	6-9	6-9	5-10	5-10	6-0	6-4	8-11	6-4	8-11	7-0	8-11	7-7	8-11	7-9
Reinf *"e" SIZE BAR	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5	#5	#6	#7	#7	#7	#7
QUANTITIES CONCRETE CF/LF	42.9	57	44.5	60.7	47	65.6	51.7	71.8	55.8	77.7	60.9	84.2	66.9	91.8	73.4	101
QUANTITIES REINFORCEMENT LB/LF	413	529	467	595	467	608	526	632	633	651	630	717	688	737	747	861
*** SOIL PRESSURE (ksf)	3.4	4.9	3.5	4.9	3.5	4.9	3.5	5.0	3.6	5.1	3.6	5.1	3.7	5.2	3.7	5.3

* See Note 5
** See Note 6
*** See Note 10

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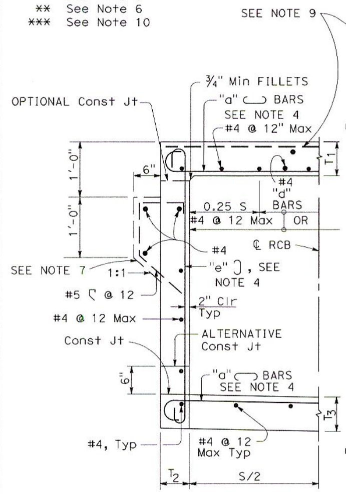
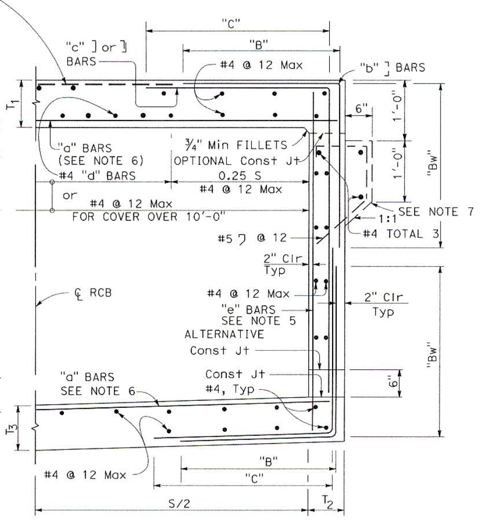
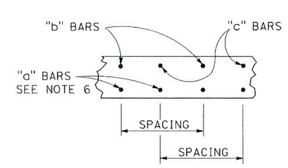


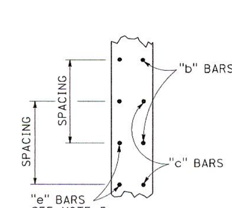
TYPICAL SECTION
SPANS 4' THRU 8'



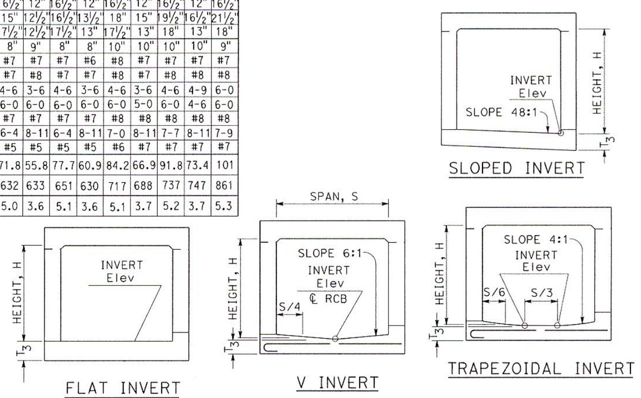
TYPICAL SECTION
SPANS 10' THRU 14'



ROOF SECTION
SPANS 10' THRU 14'
INVERT SIMILAR



WALL SECTION
SPANS 10' THRU 14'



SLOPED INVERT

FLAT INVERT

V INVERT

TRAPEZOIDAL INVERT

ALTERNATIVE INVERTS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
Cori W. Duon No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. Quantities are approximate and for design purposes only.
3. For boxes with span or height or cover greater than those shown in tables, a special design is required.
4. It is permissible to eliminate the 180° hooks on every other bar.
5. "e" bars are at half spacing (spans 10' - 14' only).
6. "a" bars are at half spacing (spans 10' - 14' only).
7. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
8. For design and details not shown, see Standard Plan D82.
9. For exposed top, provide #4 @ 12 each way, lap "c" bars 2'-0" or use full span length.
10. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

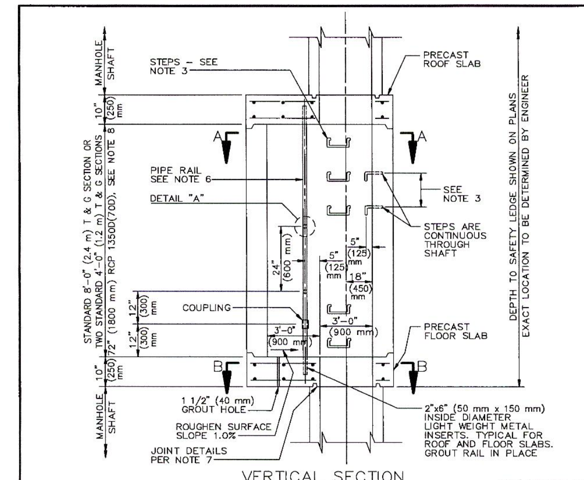
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT

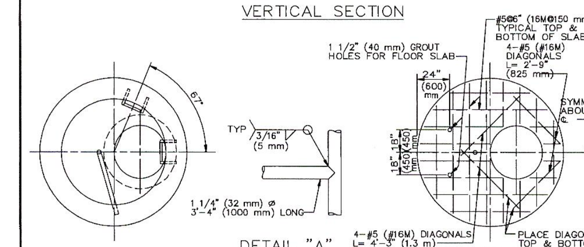
NO SCALE

D80

1-29-18



VERTICAL SECTION



SECTION A-A

DETAIL "A"
ROTATED 90°

SECTION B-B
REINFORCEMENT DETAILS FOR FLOOR AND ROOF SLABS

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009	MANHOLE SHAFT SAFETY LEDGE	STANDARD PLAN 330-2
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2

NOTES

1. MANHOLE SHAFT SAFETY LEDGE WILL BE NOTED ON THE PLANS WHEN REQUIRED. IT IS TO BE CONSTRUCTED WHEN DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
2. A SAFETY LEDGE SHALL NOT BE USED IF A PRESSURE MANHOLE IS REQUIRED.
3. STEPS SHALL CONFORM TO SPPWC 635 OR 636 AND SHALL BE ANCHORED 4" (100 mm) IN THE WALL OF THE STRUCTURE. STEPS SHALL BE PLACED TO MATCH THE SPACING OF THE MANHOLE SHAFT.
4. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300) AND SHALL TERMINATE 2" (50 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
5. GROUT HOLES, PIPE AND FITTINGS SHALL BE PROVIDED IN THE FLOOR SLAB. PRESSURE GROUTING SHALL BE USED TO FILL VOIDS AND TO SECURE UNIFORM BEARING. THE GROUT SHALL BE NEAT CEMENT GROUT AND GROUTING PRESSURES SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
6. PIPE RAIL SHALL BE FABRICATED OF 1 1/4" (32 mm) STANDARD GALVANIZED PIPE COMPOSED OF TWO SECTIONS 7'-6" (2.25 m) & 18" (450 mm) IN LENGTH JOINED BY A GALVANIZED COUPLING. THE COUPLING SHALL BE THREADED A MINIMUM OF 2" (50 mm) ON EACH PIPE LENGTH.
7. ROOF AND FLOOR SLABS SHALL BE PRECAST AND KEYED FOR REINFORCED CONCRETE PIPE SECTIONS AS SHOWN. ALL JOINTS SHALL BE FILLED WITH CLASS C MORTAR AND NEATLY POINTED OR WIPED ON THE INSIDE.
8. 72" (1800 mm) RCP SHALL BE PROVIDED WITH TWO CIRCULAR CAGES OF REINFORCEMENT.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

   324 MANHOLE SHAFT - WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT - 36" (900 mm) WITHOUT REDUCER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE SHAFT SAFETY LEDGE	STANDARD PLAN 330-2 SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

CITY OF CHINO
RECOMMENDED BY:
CITY ENGINEER 8/8/22 DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LINLEY P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. CG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO CG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No. 85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

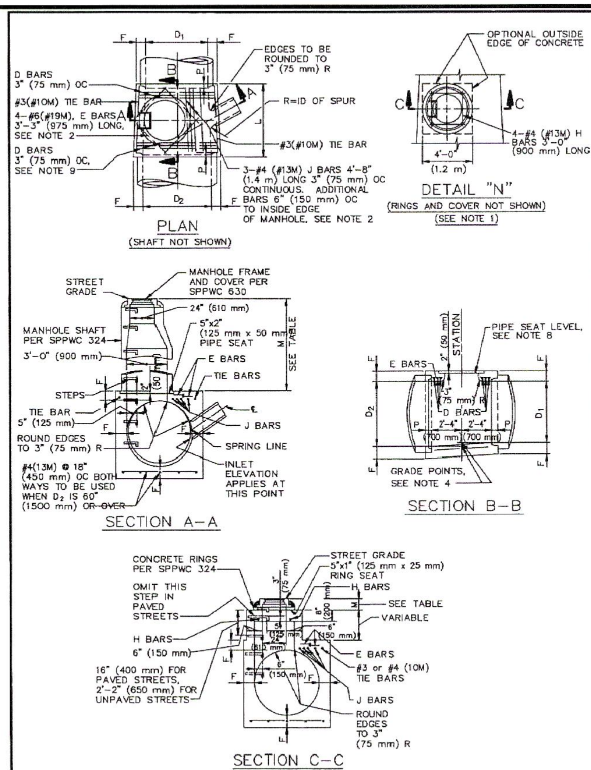
STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

SHEET 19 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14503 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

MANHOLE PIPE–TO–PIPE
MAIN LINE ID=36" (900 mm) OR LARGER

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 320–2 SHEET 1 OF 4

TABLE OF VALUES FOR F	
D_2	F
36" (900 mm)	6 1/2" (165 mm)
39" (975 mm)	7" (180 mm)
42" (1050 mm)	7 1/2" (190 mm)
45" (1125 mm)	7 3/4" (195 mm)
48" (1200 mm)	8" (205 mm)
51" (1275 mm)	8 1/2" (215 mm)
54" (1350 mm)	9" (230 mm)
57" (1425 mm)	9 1/4" (235 mm)
60" (1500 mm)	9 1/2" (240 mm)
63" (1575 mm)	10" (255 mm)
66" (1650 mm)	10 1/4" (260 mm)
69" (1725 mm)	10 3/4" (275 mm)
72" (1800 mm)	11" (280 mm)
78" (1950 mm)	11 3/4" (300 mm)
84" (2100 mm)	12 1/2" (320 mm)
90" (2250 mm)	13 1/4" (335 mm)
96" (2400 mm)	14" (355 mm)
102" (2550 mm)	15 1/2" (395 mm)
108" (2700 mm)	16" (405 mm)
114" (2850 mm)	16 1/2" (420 mm)
120" (3000 mm)	17" (430 mm)
126" (3150 mm)	17" (430 mm)
132" (3300 mm)	17 1/2" (445 mm)
138" (3450 mm)	17 1/2" (445 mm)
144" (3600 mm)	18" (455 mm)

TABLE OF VALUES FOR M (SEE NOTE 1)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN	MAX	MIN
A–A		2'–10 1/2" (867 mm)		3'–6" (1060 mm)
C–C	11" (282 mm)	8 1/2" (217 mm)	16" (410 mm)	15" (380 mm)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER

STANDARD PLAN 320–2 SHEET 2 OF 4

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'–10 1/2" (867 mm) FOR PAVED STREETS OR 3'–6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C–C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C–C. WHEN DIAMETER D_1 IS 48" (1200 mm) OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 2.
2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D_1 IS 48" (1200 mm) OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE AND OMIT J BARS.
3. L AND P SHALL HAVE THE FOLLOWING VALUES UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS:
   A. D_2=96" (2400 mm) OR LESS, L=5'–6" (1.7 m), P=5" (130 mm)
   B. D_2 OVER 96" (2400 mm), L=6'–0" (1.8 m), P=8" (210 mm)
   L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS. WHEN L GREATER THAN THAT SHOWN ABOVE IS SPECIFIED, D BARS SHALL BE CONTINUED 6" (150 mm) OC.
4. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES.
5. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
6. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
7. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
8. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES FOR F SHOWN ON SHEET 2.
9. D BARS SHALL BE #4 (#13M) FOR D_2=39" (975 mm) OR LESS, #5 (#16M) FOR D_2= 42" (1050 mm) TO 84" (2100 mm) INCLUSIVE AND #6 (#19M) FOR D_2= 90" (2250 mm) OR OVER.
10. CENTERLINE OF INLET PIPE SHALL INTERSECT INSIDE FACE OF CONE AT SPRING LINE UNLESS OTHERWISE SHOWN.
11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
   A. MAIN LINE = 36" (900 mm) INSIDE DIAMETER OR LARGER. EXCEPT IF THE MAIN LINE RCP DOWNSTREAM OF MANHOLE IS 36" (900 mm) TO 42" (1050 mm) INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" (825 mm) OR LESS SPPWC 321 SHALL BE USED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER

STANDARD PLAN 320–2 SHEET 3 OF 4

   B. THE OUTSIDE DIAMETER OF THE LATERAL MUST BE LESS THAN OR EQUAL TO 1/2 THE INSIDE DIAMETER OF THE MAIN LINE. IF THE UPSTREAM AND DOWNSTREAM DIAMETERS OF THE MANHOLE ARE NOT THE SAME, THE GOVERNING INSIDE DIAMETER OF THE MAIN LINE SHALL BE CONSIDERED TO BE THAT WHERE THE EXTENDED CENTERLINE OF THE LATERAL ENTERS THE MANHOLE.
   C. IN NO INSTANCE SHALL THE INSIDE DIAMETER OF THE LATERAL TO THE MANHOLE BE GREATER THAN 30" (750 mm).
13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
   324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
   328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
   329 PRESSURE MANHOLE SHAFT 36" (914 mm) WITHOUT REDUCER
   630 24" (610 mm) MANHOLE FRAME AND COVER
   633 36" (914 mm) MANHOLE FRAME AND COVER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

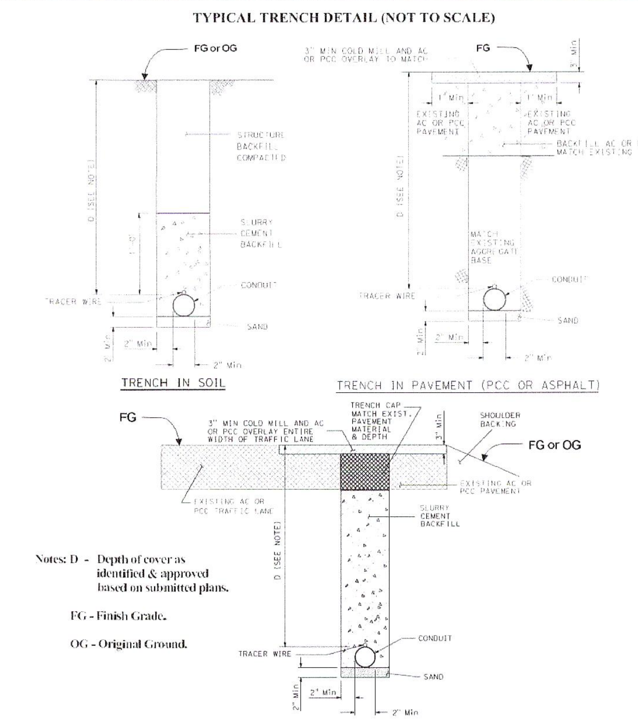
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER

STANDARD PLAN 320–2 SHEET 4 OF 4

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT TRENCH DETAIL
TR-0153 (Rev. 11/2019) Page 1 of 2

TYPICAL TRENCH DETAIL (NOT TO SCALE)



STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT TRENCH DETAIL
TR-0153 (Rev. 11/2019) Page 2 of 2

- **All work must be authorized by the encroachment permit, and/or as directed by the State's representative.**
- **A tracer wire must be placed on top of the conduit unless specified not to.**
- **Clearance between the trench wall and encroachment work less than 6 inches in width shall be a minimum of 2 inches. Clearance between the trench wall and encroachment work greater than 6 inches width shall be a minimum of 6 inches.**
- **When the trench width is less than 2' the backfill for subgrade must consist of either slurry cement or Controlled Low-Strength Material (CLSM).**
- **When trench width is greater than 2' compacted aggregate base may be used for backfill.**
- **Structure backfill must conform to Section 19-3.02C of the Standard Specifications.**
- **For trench located under unimproved surface, structure backfill can use the original soil. Soil must be compacted by mechanical means. Ponding, jetting or flooding are not allowed. Slurry cement backfill is optional at the discretion of the Caltrans District.**
- **Slurry cement backfill must conform to Section 19-3.02E of the Standard Specifications.**
- **Aggregate base shall conform to Section 26 of the Standard Specifications.**
- **CLSM must conform to Section 19-3.02G of the Standard Specifications. When CLSM is utilized the mix design and test results must be submitted to the State's representative. See Appendix H of the Encroachment Permits Manual for additional information.**
- **Cold planed surface and overlay shall be to the nearest lane line for the entire length of the trench/disturbed areas, and/or as directed by the State's representative.**
- **A paving notch ("T" Cut) shall be cold planed in exist asphalt concrete to a minimum width of 1.0' beyond each side of the trench and to a depth of 3" for the final layer of HMA.**
- **HMA or PCC to replace pavement section shall match existing pavement depth, unless directed otherwise by the State's representative.**
- **Hot mix asphalt must conform to Section 39 of the Standard Specifications.**
- **A tack coat of asphaltic emulsion conforming to Section 39-2.01C (3) (f) shall be applied.**
- **When the trench is within 4' of curb and gutter, additional cold planing may be required at the discretion of the State's representative.**
- **Pavement markings and/or striping removed or damaged during construction must be replaced as directed by the State's representative.**
- **Other trench related details are shown in Chapter 6 of the Encroachment Permits Manual as well as the Trenching and Shoring Manual. Both publications can be found on the State of California, Department of Transportation's website.**

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: ____ 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: ____ DATE: ____

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG–18–1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG–18–1." SET ON TOP OF CURB. APPROX 5' +/– SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989–9789 FAX: (909) 989–9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

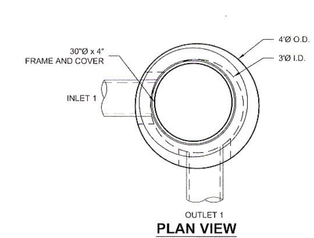
DETAILS

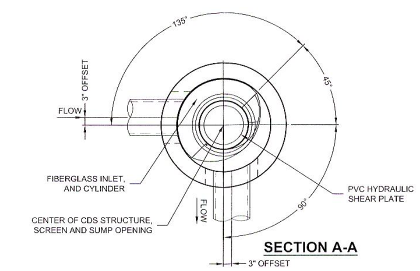
PM-20016

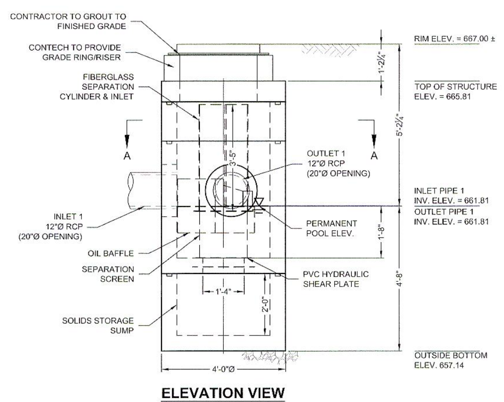
SHEET 20 OF 21
CONTRACT ____
ACCOUNT ____
DWG. NO. AA 5949 SD

D14504 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 – 4:06pm by: Brent.King







MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET AND CYLINDER	CONTECH
1	4700 micron, 1.5' O.D. x 1.5' SEP. SCREEN	CONTECH
1	3/16 INCH PVC HYDRAULIC SHEAR PLATE *	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1 PLC	GRADE RINGS/RISERS	CONTRACTOR
1	30"Ø x 4" FRAME & COVER, EJ#001810119A01, OR EQUIV.	CONTRACTOR

* SEE HYDRAULIC SHEAR PLATE DETAIL

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT

APPROXIMATE HEAVIEST PICK = 4000 LBS.
STRUCTURE IS DELIVERED IN 4 PIECES

MAX FOOTPRINT = Ø4'

CONTECH CONTRACT DRAWING

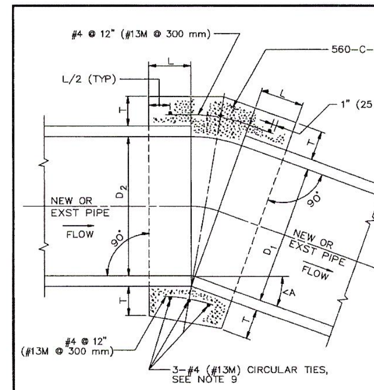
PRECS LAYOUT 4A
1515-3-FGIS
5850 / 453627

CDS1515-3-C 686090-10
MERRILL AVE
ONTARIO, CA
###

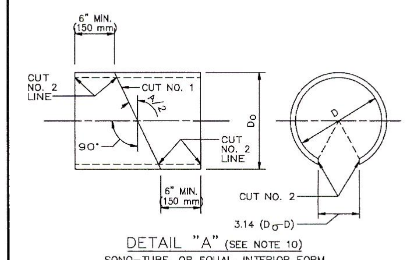
CONTECH ENGINEERED SOLUTIONS LLC

DATE: 08/16/21	SCALE: 3/8" = 1'-0"
DESIGNED: RLH	DRAWN: RLH
CHECKED: ###	APPROVED: ###
PROJECT No.: 686090	SEQUENCE No.: 10
SHEET: 1	OF 1

MARK	DATE	REVISION DESCRIPTION	BY

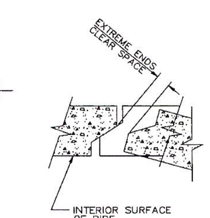


D	L	T
12" (300 mm)	12" (300 mm)	4" (100 mm)
18" (450 mm)	12" (300 mm)	5" (125 mm)
24" (600 mm)	12" (300 mm)	6" (150 mm)
30" (750 mm)	18" (450 mm)	7" (175 mm)
36" (900 mm)	18" (450 mm)	9" (225 mm)
42" (1050 mm)	18" (450 mm)	9" (225 mm)
48" (1200 mm)	18" (450 mm)	10" (250 mm)
57" (1425 mm)	18" (450 mm)	10" (250 mm)
60" (1500 mm)	21" (525 mm)	11" (275 mm)
66" (1650 mm)	21" (525 mm)	11" (275 mm)
72" (1800 mm)	24" (600 mm)	12" (300 mm)



DETAIL "A" (SEE NOTE 10)

SONO-TUBE, OR EQUAL, INTERIOR FORM



DETAIL "B"

TYPICAL JOINT FOR REINFORCED CONCRETE PIPE

CUT NO. 1: SAW THE TUBE AT AN ANGLE OF A/2 WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A.
CUT NO. 2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP 3.14 (D_O-D) WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE CUT TOGETHER AND INSERT THE TUBE IN THE PIPE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 1997, 1999, 2009

CONCRETE COLLAR FOR RCB 12" (300 mm) THROUGH 72" (1800 mm)

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 380–4 SHEET 1 OF 2

NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10%.
2. FOR CURVE JOINTS (SEE DETAIL B, SHEET 1)
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 1" (25 mm), BUT IS LESS THAN 3" (75 mm) A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SSPWC 306-1.2.4.
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 3" (75 mm), BUT LESS THAN 6" (150 mm), A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 6" (150 mm) OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
   A. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. D=D_1 OR D_2, WHICHEVER IS GREATER.
   B. WHEN D_1 IS EQUAL TO OR LESS THAN D_2, JOIN INVERTS AND WHEN D_1 IS GREATER THAN D_2, JOIN SOFFITS.
5. FOR PIPE LARGER THAN 72" (1800 mm) SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 (A 615 M) GRADE 40 (300).
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2X WALL THICKNESS) + T.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21" (525 mm) AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 3" (75 mm) OR LARGER.

CIRCULAR TIES:

PIPE DIAMETER	NO. OF CIRCULAR TIES
21" (525 mm) OR LESS	3
24" (600 mm) TO 30" (750 mm)	3
33" (825 mm) TO 57" (1425 mm)	4
60" (1500 mm) TO 72" (1800 mm)	5

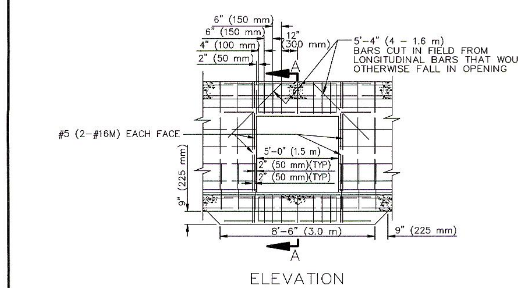
WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 3" (75 mm), THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" (150 mm) O.C.

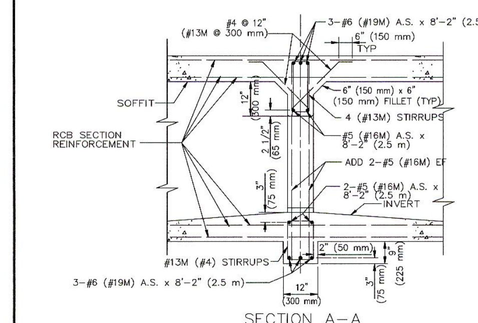
10. WHERE THE PIPE IS 21" (525 mm) OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 24" (600 mm) OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

CONCRETE COLLAR FOR RCB 12" (300 mm) THROUGH 72" (1800 mm)

STANDARD PLAN 380–4 SHEET 2 OF 2





STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009

WINDOW DETAILS FOR MULTIPLE RCB STRUCTURES

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 382–2 SHEET 1 OF 2

NOTES

1. THIS STRUCTURE MAY BE USED WHERE:
   a. DEPTH OF COVER DOES NOT EXCEED 10' (3.0 m).
   b. CLEAR SPAN OF ONE BARREL DOES NOT EXCEED 12' (3.6 m). WHEN THESE LIMITS ARE EXCEEDED, WINDOW OPENING DETAILS SHALL BE AS SHOWN ON PLANS.
2. LONGITUDINAL BARS SHALL BE CUT IN THE FIELD 2" (50 mm) FROM OPENING.
3. ROUND ALL EDGES TO 2" (50 mm) RADIUS.
4. NO TRANSVERSE CONSTRUCTION JOINT SHALL BE PLACED WITHIN 5'-0" (1.5 m) OF WINDOW.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

WINDOW DETAILS FOR MULTIPLE RCB STRUCTURES

STANDARD PLAN 382–2 SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 21 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14505 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:07pm by: Brent.King

EXHIBITS

EXHIBIT A: EUCLID AVENUE STORM DRAIN DRAINAGE FACILITIES MAP

EUCLID MIXED USE SPECIFIC PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

EUCLID AVENUE STORM DRAIN

DRAINAGE FACILITIES MAP

EXHIBIT "A"

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EUCLID MIXED USE SPECIFIC PLAN

EUCLID AVENUE STORM DRAIN DRAINAGE FACILITIES MAP

EUCLID MIXED USE SPECIFIC PLAN

HYDRAULIC REPORT
IN SUPPORT OF
EUCLID AVENUE STORM DRAIN
(EULD-XIV-4)

CITY OF ONTARIO
CALIFORNIA

PREPARED FOR:

WESTLAND GROUP, INC.
4150 CONCOURS, ONTARIO CA

PREPARED BY:

JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552
FAX 951.304.3568

JULY 10, 2023

EUCLID MIXED USE SPECIFIC PLAN
HYDRAULIC REPORT IN SUPPORT OF
EUCLID AVENUE STORM DRAIN (EULD-XIV-4)
ONTARIO, CA

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

07/10/2023

Joseph L. Castaneda RCE 59835 Registered Civil Engineer	Date	Seal

TABLE OF CONTENTS

FIGURES

APPENDICES

EXCERPTS

EXHIBITS

I. PURPOSE AND SCOPE

The purpose of this study is to evaluate the offsite storm drain systems located in Euclid Avenue and Schaefer Avenue which is proposed as part of the Euclid Mixed Use Specific Plan (EMUSP) project. The EMUSP project site is located within the City of Ontario Master Drainage Plan Area XIV and plans to construct several City of Ontario Master Drainage Plan storm drain facilities.

The scope of the study includes the following:

1. Determination of the 100-year peak flow rates for the Euclid Avenue and Schaefer Avenue storm drain systems based on the City of Ontario Master Drainage Plan.
2. Hydraulically assess the proposed mainline and lateral storm drain systems located in Euclid Avenue and Schaefer Avenue.
3. Preparation of a drainage report, which consists of hydraulic and analytical results and exhibits.

II. PROJECT DESCRIPTION AND MASTER DRAINAGE PLAN OVERVIEW

Euclid Mixed Use Specific Plan (EMUSP) is a proposed industrial development within the City of Ontario. The project site is bounded by Schaefer Avenue to the north, Euclid Avenue to the west, Edison Avenue to the south, and Sultana Avenue to the east, as shown on Figure 1 Vicinity Map. The Euclid Avenue mainline and Schaefer Avenue lateral storm drain systems which are the focus of this report are located on Euclid Avenue from Eucalyptus Avenue to Schaefer Avenue and within Schaefer Avenue, respectively, as shown on Figure 1 Vicinity Map. The project site is located within the City of Ontario’s Master Drainage Plan (MDP) Area XIV, see Excerpt A. The City of Ontario’s Master Drainage Plan Planned Facilities Map has been included as Excerpt B.

The MDP Area XIV is approximately bounded by Riverside Drive to the north, between Bon View Avenue and Grove Avenue to the east, Merrill Avenue to the south, and Euclid Avenue to the west, see Figure 1 Vicinity Map. Runoff flows to the south and is collected in storm drain facilities which ultimately discharge into the City of Chino Line I system located south of the southwestern corner of Area XIV near the intersection of Merrill Avenue and Euclid Avenue.

As part of the PM 20016 Project (Ontario Ranch Business Park) storm drain infrastructure is being constructed along Euclid Avenue, Eucalyptus Avenue, Merrill Avenue, Sultana Avenue, Campus Avenue, and Bon View Avenue. Similarly, the PM 20714 Project (Excerpt D) will seek to construct storm drain within Schaefer Avenue stemming from the Euclid Avenue mainline. The EMUSP project was assessed based on the downstream storm drain construction being completed and operational. The existing MDP facilities constructed per PM 20016 are shown on Figure 2.

The EMUSP project proposes the following Master Drainage Plan Facilities, as shown on Figure 3:

1. EULD-XIV-1 located on Euclid Avenue between Eucalyptus Avenue and Schaefer Avenue.
2. EULD-XIV-4 located on Schaefer Avenue east of Euclid Avenue

This report focuses on the mainline analysis for the proposed MDP systems located on Euclid Avenue and the lateral analysis for the proposed system in Schaefer Avenue which stems from the Euclid Avenue mainline:

MDP System	Location	Name used in this report and on the SD Improvement Plans	Flow Rate per MDP (see Excerpt A)
EULD-XIV-1	Euclid Ave, north of Schaefer Ave	Euclid Ave SD / Line A	338.5 ft^3/s
EULD-XIV-1	Euclid Ave, south of Schaefer Ave, north of Edison Ave	Euclid Ave SD / Line A	568.4 ft^3/s
EULD-XIV-1	Euclid Ave, south of Edison Ave	Euclid Ave SD / Line A	829.1 ft^3/s
EULD-XIV-3*	Edison Avenue	Line B	289.0 ft^3/s
EULD-XIV-4*	Schaefer Avenue	Line C	234.5 ft^3/s

*Only the portions of the EULD-XIV-3 and EULD-XIV-4 storm drain systems located within Euclid Avenue were included in the analysis for this report. Separate reports shall be prepared to assess the rest of the EULD-XIV-3 and EULD-XIV-4 systems proposed as part of the EMUSP project.

III. OFFSITE HYDRAULICS

A Drainage Facilities Map has been provided, see Exhibit A. The Euclid Avenue and Schaefer Avenue storm drain systems were hydraulically assessed using the WSPG program.

The flow rates used for the hydraulic analysis are per the flow rates established by the City of Ontario Master Drainage Plan. The flow rates used are listed on the table in the previous section and shown on the Drainage Facilities Map, Exhibit A.

The downstream control for the Euclid Ave/Line A system was 649.82 per the storm drain plans for the downstream storm drain system. The hydraulic grade line calculated for Euclid Ave/Line A was used as the downstream control for Line B and Line C. The improvement plans for the downstream storm drain system have been included as Excerpt C. Moreover, the downstream control for the Euclid Ave/Schaefer Ave system was 702.54 per the results of the Euclid Avenue analysis contained in Appendix A.1. All WSPG calculations are included in Appendix A.

It should be noted that at this time the Schaefer Avenue lateral (EULD-XIV-4) which stems from the Euclid Avenue mainline (EULD-XIV-1) does not currently account for the dissemination of the anticipated inflows along the alignment. Therefore, EULD-XIV-4 has been conservatively modeled with WSPG assuming the maximum expected MDP flowrate of 234.5 ft^3/s is propagated along the entire alignment. The calculations in the current WSPG output suggest that the design is sufficient under this assumption; however, the ultimate behavior of this alignment will improve once a more nuanced consideration of where the lateral will capture inflows has been assessed.

IV. CONCLUSION

The study evaluated the storm drain improvements located in Euclid Avenue and Schaefer Avenue associated with the Euclid Mixed Use Specific Plan project. It has been concluded that:

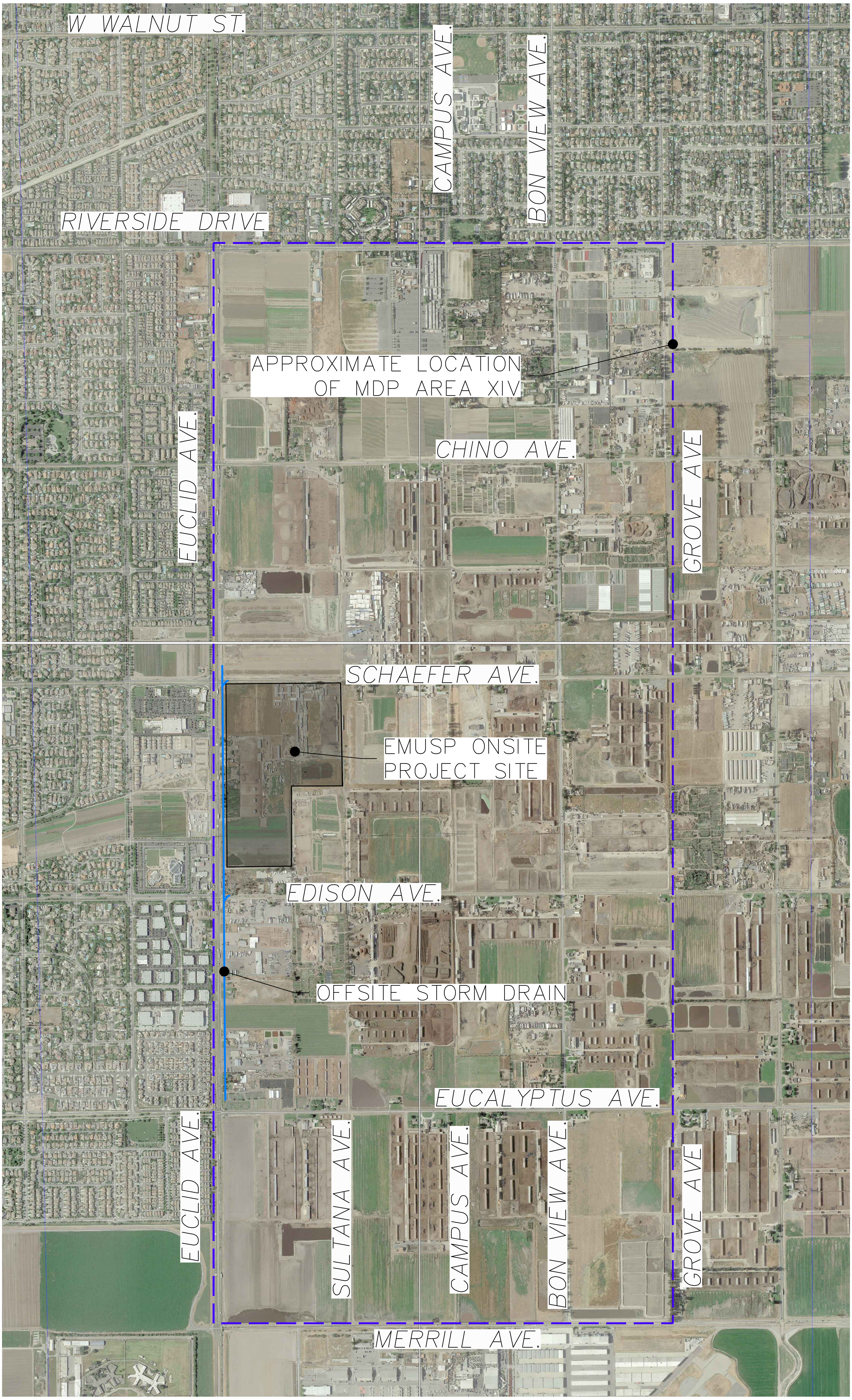
1. The proposed project is located within the City of Ontario Master Drainage Plan Area XIV which provides the regional storm drain system to flood protect the area.
2. The proposed Euclid Avenue storm drain systems are City of Ontario Master Drainage Plan planned facilities. The MDP has established flow rates for the proposed storm drain systems.
3. A hydraulic grade line has been established for the proposed storm drain systems.

V. REFERENCES

1. San Bernardino Flood Control Hydrology Manual, August 1986.
2. City of Ontario Master Plan of Drainage, Revised June 2017

FIGURES

FIGURE 1: VICINITY MAP



SCALE 1"=1200'

VICINITY MAP

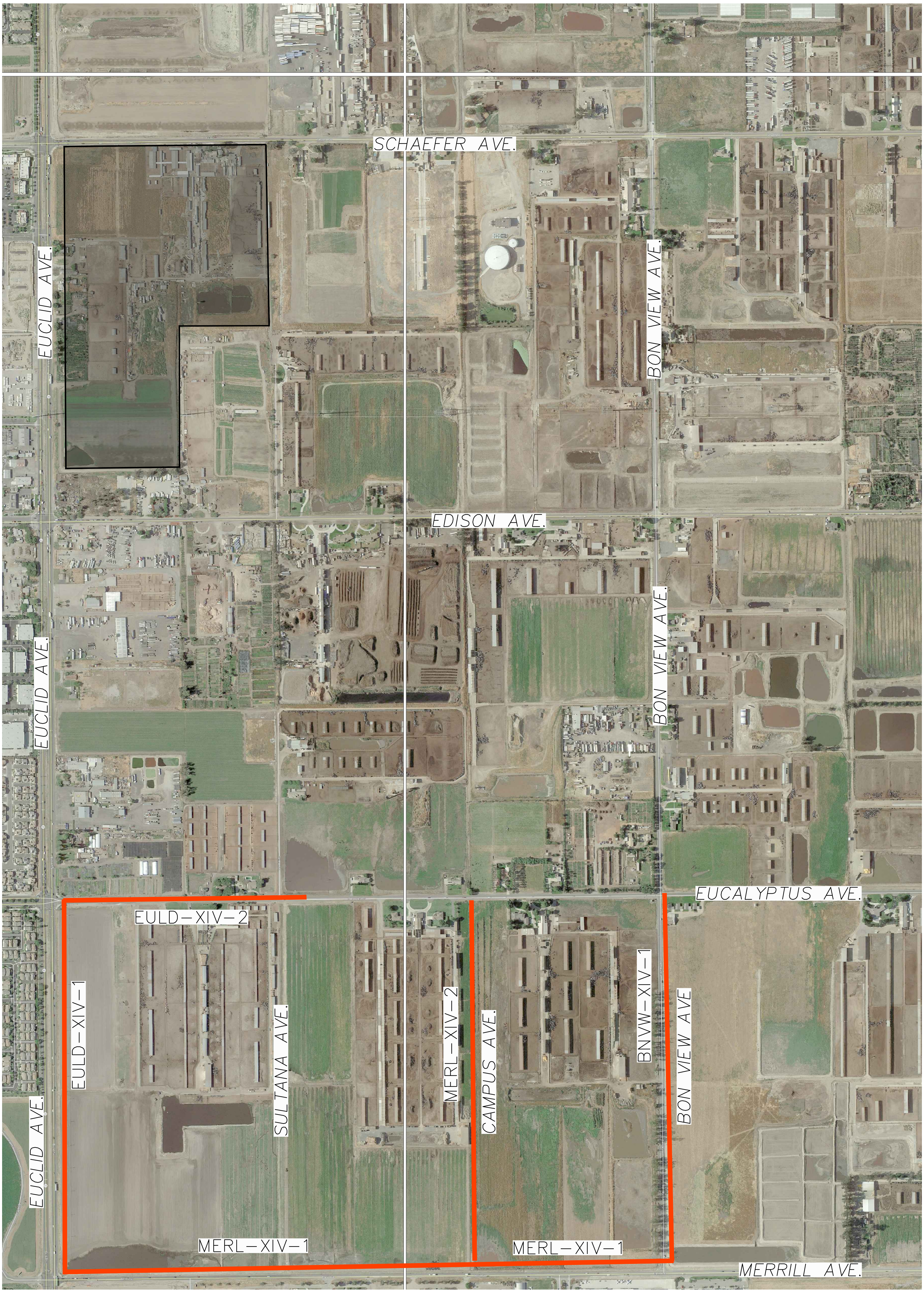
FIGURE 1

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits_Offsite_Hydraulics\FIGURE-1-VICINITY-MAP.dwg
Last Opened: May 10, 2023 - 10:48am by stanner

FIGURE 2: EXISTING MDP DRAINAGE FACILITIES MAP

EXISTING MDP DRAINAGE FACILITIES MAP



SCALE 1"=700'

LEGEND:

EXISTING MDP SYSTEMS PER PM 20016

EMUSP ONSITE PROJECT SITE

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

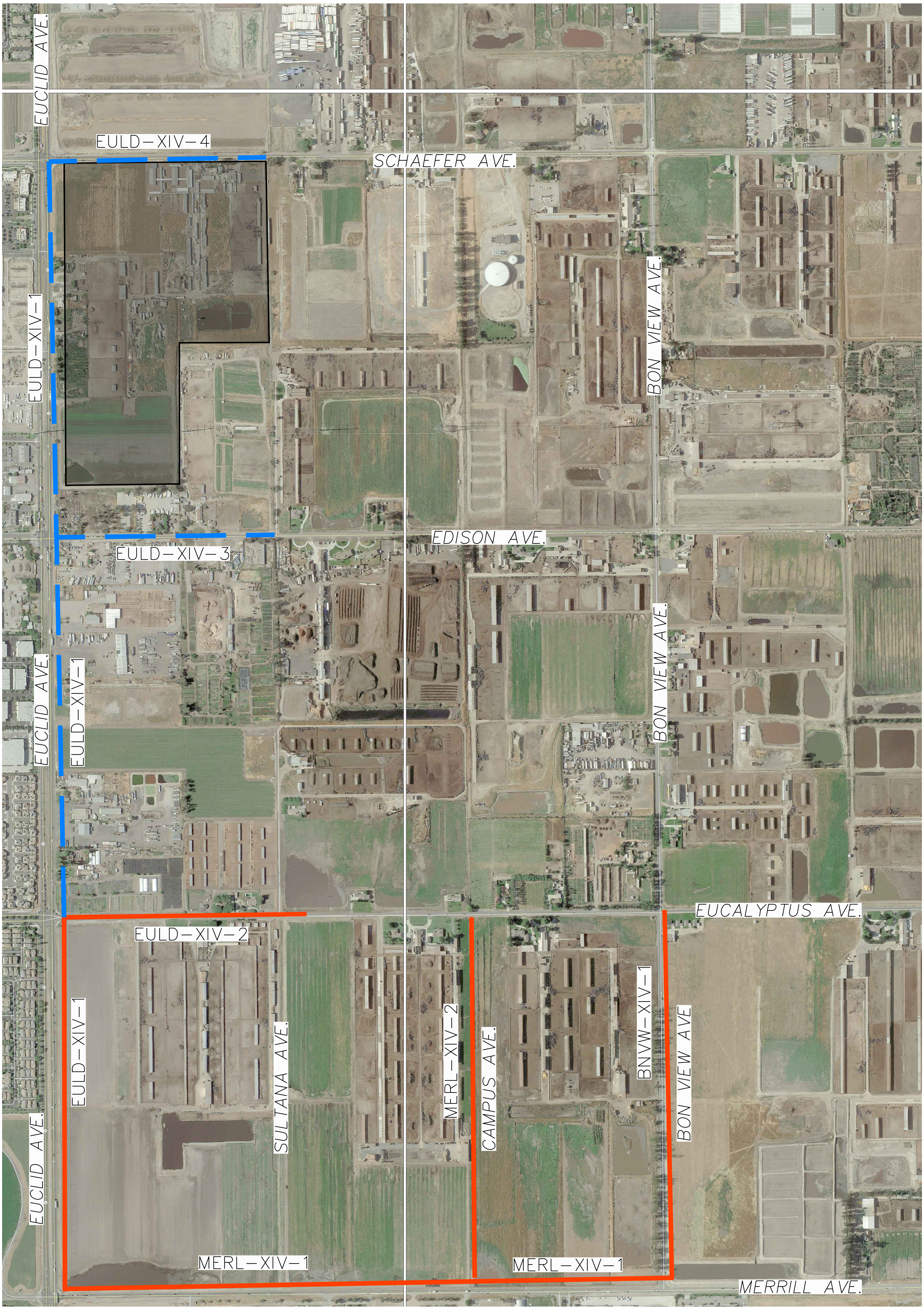
FIGURE 2

EXISTING MDP DRAINAGE FACILITIES MAP

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits_Offsite_Hydraulics\FIGURE-2-EXISTING-MDP.dwg
Last Opened: May 10, 2023 - 10:51am by stanner

FIGURE 3: PROPOSED MDP DRAINAGE FACILITIES MAP

PROPOSED MDP DRAINAGE FACILITIES MAP



SCALE 1"=700'

LEGEND:

EXISTING MDP SYSTEMS PER PM 20016

PROPOSED MDP SYSTEMS PER EMUSP

EMUSP ONSITE PROJECT SITE

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

FIGURE 3

PROPOSED MDP DRAINAGE FACILITIES MAP

Drawing Name: O:\265.24.23\Engineering\Hydrology_Plan\Exhibits_Offsite_Hydraulics\FIGURE-3-PROPOSED-MDP.dwg
Last Opened: May 10, 2023 - 2:02pm by stanner

APPENDICES

APPENDIX A: STORM DRAIN HYDRAULIC CALCULATIONS

APPENDIX A.1: EUCLID AVENUE WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR EUCLID AVENUE (SR83)
T3 FN: EUCLID.WSW
SO   3762.560 639.170  1                          649.820
R    3935.350 640.730  1      .013                                 .000    .000 0
R    6192.240 664.650  1      .013                                 .000    .000 0
JX   6212.400 665.150  3  2   .013  260.700         664.920         45.0         .000
R    8821.510 692.810  3      .013                                 .000    .000 0
JX   8841.670 693.310  5  4   .013  229.900         692.820         45.0         .000
R    9084.670 695.890  5      .013                                 .000    .000 0
SH   9084.670 695.890  5                          695.890
CD   1  4   1    .000   8.500     .000  .000  .000   .00
CD   2  4   1    .000   8.000     .000  .000  .000   .00
CD   3  4   1    .000   7.500     .000  .000  .000   .00
CD   4  4   1    .000   7.500     .000  .000  .000   .00
CD   5  4   1    .000   6.500     .000  .000  .000   .00
Q           338.500   .0
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Program Package Serial Number: 7028

WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:53:48

265.24.22

WSPG RUN FOR EUCLID AVENUE (SR83)

FN: EUCLID.WSW

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
3762.560	639.170	10.650	649.820	829.10	14.61	3.31	653.13	.00	7.15	.00	8.500	.000	.00	1 .0
172.790	.0090					.0060	1.03	10.65	.00	5.82	.013	.00	.00	PIPE
3935.350	640.730	10.123	650.853	829.10	14.61	3.31	654.17	.00	7.15	.00	8.500	.000	.00	1 .0
253.820	.0106					.0060	1.52	10.12	.00	5.50	.013	.00	.00	PIPE
4189.170	643.420	8.950	652.370	829.10	14.61	3.31	655.68	.00	7.15	.00	8.500	.000	.00	1 .0
HYDRAULIC JUMP														
4189.170	643.420	5.498	648.918	829.10	21.35	7.08	656.00	.00	7.15	8.13	8.500	.000	.00	1 .0
824.484	.0106					.0106	8.74	5.50	1.72	5.50	.013	.00	.00	PIPE
5013.654	652.159	5.498	657.657	829.10	21.35	7.08	664.74	.00	7.15	8.13	8.500	.000	.00	1 .0
698.644	.0106					.0102	7.11	5.50	1.72	5.50	.013	.00	.00	PIPE
5712.297	659.563	5.664	665.227	829.10	20.64	6.62	671.84	.00	7.15	8.02	8.500	.000	.00	1 .0
255.673	.0106					.0092	2.36	5.66	1.63	5.50	.013	.00	.00	PIPE
5967.970	662.273	5.911	668.184	829.10	19.68	6.02	674.20	.00	7.15	7.82	8.500	.000	.00	1 .0
117.552	.0106					.0082	.97	5.91	1.49	5.50	.013	.00	.00	PIPE
6085.522	663.519	6.178	669.697	829.10	18.77	5.47	675.17	.00	7.15	7.58	8.500	.000	.00	1 .0
63.649	.0106					.0074	.47	6.18	1.37	5.50	.013	.00	.00	PIPE
6149.171	664.194	6.469	670.662	829.10	17.89	4.97	675.63	.00	7.15	7.25	8.500	.000	.00	1 .0
32.814	.0106					.0066	.22	6.47	1.25	5.50	.013	.00	.00	PIPE

Program Package Serial Number: 7028
WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:53:48
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WSPG RUN FOR EUCLID AVENUE (SR83)
FN: EUCLID.WSW

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
6181.985	664.541	6.790	671.331	829.10	17.06	4.52	675.85	.00	7.15	6.82	8.500	.000	.00	1 .0
10.255	.0106					.0060	.06	6.79	1.13	5.50	.013	.00	.00	PIPE
6192.240	664.650	7.155	671.805	829.10	16.26	4.11	675.91	.00	7.15	6.21	8.500	.000	.00	1 .0
JUNCT STR	.0248					.0056	.11	7.15	1.00		.013	.00	.00	PIPE
6212.400	665.150	10.172	675.322	568.40	12.87	2.57	677.89	.00	6.14	.00	7.500	.000	.00	1 .0
474.593	.0106					.0055	2.60	10.17	.00	4.71	.013	.00	.00	PIPE
6686.993	670.181	7.741	677.922	568.40	12.87	2.57	680.49	.00	6.14	.00	7.500	.000	.00	1 .0
HYDRAULIC JUMP														
6686.993	670.181	4.707	674.889	568.40	19.47	5.89	680.78	.00	6.14	7.25	7.500	.000	.00	1 .0
1233.438	.0106					.0106	13.08	4.71	1.71	4.71	.013	.00	.00	PIPE
7920.431	683.257	4.707	687.965	568.40	19.47	5.89	693.85	.00	6.14	7.25	7.500	.000	.00	1 .0
566.900	.0106					.0101	5.70	4.71	1.71	4.71	.013	.00	.00	PIPE
8487.331	689.267	4.888	694.156	568.40	18.64	5.39	699.55	.00	6.14	7.15	7.500	.000	.00	1 .0
172.320	.0106					.0090	1.55	4.89	1.59	4.71	.013	.00	.00	PIPE
8659.651	691.094	5.099	696.193	568.40	17.77	4.90	701.10	.00	6.14	7.00	7.500	.000	.00	1 .0
84.289	.0106					.0080	.67	5.10	1.47	4.71	.013	.00	.00	PIPE
8743.940	691.988	5.325	697.313	568.40	16.94	4.46	701.77	.00	6.14	6.81	7.500	.000	.00	1 .0
46.346	.0106					.0071	.33	5.32	1.35	4.71	.013	.00	.00	PIPE

Program Package Serial Number: 7028
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265.24.22
WSPG RUN FOR EUCLID AVENUE (SR83)
FN: EUCLID.WSW

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
8790.286	692.479	5.570	698.049	568.40	16.16	4.05	702.10	.00	6.14	6.56	7.500	.000	.00	1 .0
23.871	.0106					.0064	.15	5.57	1.23	4.71	.013	.00	.00	PIPE
8814.157	692.732	5.838	698.570	568.40	15.40	3.68	702.25	.00	6.14	6.23	7.500	.000	.00	1 .0
7.353	.0106					.0058	.04	5.84	1.12	4.71	.013	.00	.00	PIPE
8821.510	692.810	6.139	698.949	568.40	14.69	3.35	702.30	.00	6.14	5.78	7.500	.000	.00	1 .0
JUNCT STR	.0248					.0048	.10	6.14	1.00		.013	.00	.00	PIPE
8841.670	693.310	9.234	702.544	338.50	10.20	1.62	704.16	.00	4.94	.00	6.500	.000	.00	1 .0
243.000	.0106					.0042	1.01	9.23	.00	3.73	.013	.00	.00	PIPE
9084.670	695.890	7.667	703.557	338.50	10.20	1.62	705.17	.00	4.94	.00	6.500	.000	.00	1 .0

APPENDIX A.2: SCHAEFER AVENUE WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR SCHAEFER AVENUE (SR83)

T3 FN: SCHAEFER.WSW

SO   1122.560 693.420  3                          702.544

R    1521.110 695.410  3      .013                                  .000    .000 0

TS   1525.810 696.940  3      .013                                  .000
R    1871.110 698.660  5      .013                                  .000    .000 0

R    1875.810 698.690  5      .013                                  .000    .000 0
R    2221.110 700.410  5      .013                                  .000    .000 0

R    2225.800 700.440  5      .013                                  .000    .000 0
R    2536.050 701.990  5      .013                                  .000    .000 0

TS   2540.720 704.010  5      .013                                  .000
R    2613.100 704.370  6      .013                                  .000    .000 0

SH   2613.100 704.370  6                          704.370

CD   1  4   1    .000   8.500     .000  .000  .000   .00

CD   2  4   1    .000   8.000     .000  .000  .000   .00

CD   3  4   1    .000   7.500     .000  .000  .000   .00

CD   4  4   1    .000   6.500     .000  .000  .000   .00
CD   5  4   1    .000   6.000     .000  .000  .000   .00
CD   6  4   1    .000   4.000     .000  .000  .000   .00

Q           234.500   .0
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Program Package Serial Number: 7028

WATER SURFACE PROFILE LISTING Date: 7- 7-2023 Time: 1:39:53

265.24.22

WSPG RUN FOR SCHAEFER AVENUE (SR83)

FN: SCHAEFER.WSW

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
1122.560	693.420	9.124	702.544	234.50	5.31	.44	702.98	.00	3.92	.00	7.500	.000	.00	1 .0
398.550	.0050					.0009	.37	9.12	.00	3.45	.013	.00	.00	PIPE
1521.110	695.410	7.506	702.916	234.50	5.31	.44	703.35	.00	3.92	.00	7.500	.000	.00	1 .0
TRANS STR	.3255					.0010	.00	7.51	.00		.013	.00	.00	PIPE
1525.810	696.940	5.827	702.767	234.50	8.36	1.09	703.85	.00	4.19	2.01	6.000	.000	.00	1 .0
147.990	.0050					.0027	.40	5.83	.39	4.00	.013	.00	.00	PIPE
1673.800	697.677	5.382	703.059	234.50	8.77	1.19	704.25	.00	4.19	3.65	6.000	.000	.00	1 .0
87.833	.0050					.0028	.25	5.38	.57	4.00	.013	.00	.00	PIPE
1761.633	698.115	5.072	703.186	234.50	9.20	1.31	704.50	.00	4.19	4.34	6.000	.000	.00	1 .0
66.481	.0050					.0031	.20	5.07	.67	4.00	.013	.00	.00	PIPE
1828.114	698.446	4.812	703.258	234.50	9.65	1.45	704.70	.00	4.19	4.78	6.000	.000	.00	1 .0
42.996	.0050					.0033	.14	4.81	.75	4.00	.013	.00	.00	PIPE
1871.110	698.660	4.626	703.286	234.50	10.03	1.56	704.85	.00	4.19	5.04	6.000	.000	.00	1 .0
4.700	.0064					.0035	.02	4.63	.82	3.67	.013	.00	.00	PIPE
1875.810	698.690	4.582	703.272	234.50	10.12	1.59	704.86	.00	4.19	5.10	6.000	.000	.00	1 .0
35.686	.0050					.0037	.13	4.58	.84	4.00	.013	.00	.00	PIPE
1911.496	698.868	4.397	703.264	234.50	10.56	1.73	705.00	.00	4.19	5.31	6.000	.000	.00	1 .0

HYDRAULIC JUMP

Program Package Serial Number: 7028

WATER SURFACE PROFILE LISTING

Date: 7- 7-2023 Time: 1:39:53

265.24.22

WSPG RUN FOR SCHAEFER AVENUE (SR83)

FN: SCHAEFER.WSW

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
1911.496	698.868	4.002	702.870	234.50	11.70	2.13	705.00	.00	4.19	5.66	6.000	.000	.00	1 .0
120.299	.0050					.0051	.61	4.00	1.10	4.00	.013	.00	.00	PIPE
2031.796	699.467	3.949	703.416	234.50	11.88	2.19	705.61	.00	4.19	5.69	6.000	.000	.00	1 .0
114.727	.0050					.0055	.63	3.95	1.12	4.00	.013	.00	.00	PIPE
2146.523	700.038	3.789	703.828	234.50	12.46	2.41	706.24	.00	4.19	5.79	6.000	.000	.00	1 .0
74.587	.0050					.0062	.46	3.79	1.22	4.00	.013	.00	.00	PIPE
2221.110	700.410	3.639	704.049	234.50	13.07	2.65	706.70	.00	4.19	5.86	6.000	.000	.00	1 .0
4.690	.0064					.0066	.03	3.64	1.32	3.67	.013	.00	.00	PIPE
2225.800	700.440	3.638	704.078	234.50	13.08	2.65	706.73	.00	4.19	5.86	6.000	.000	.00	1 .0
34.192	.0050					.0068	.23	3.64	1.32	4.00	.013	.00	.00	PIPE
2259.992	700.611	3.561	704.172	234.50	13.41	2.79	706.97	.00	4.19	5.89	6.000	.000	.00	1 .0
57.026	.0050					.0075	.43	3.56	1.37	4.00	.013	.00	.00	PIPE
2317.018	700.896	3.424	704.319	234.50	14.07	3.07	707.39	.00	4.19	5.94	6.000	.000	.00	1 .0
50.979	.0050					.0085	.43	3.42	1.48	4.00	.013	.00	.00	PIPE
2367.997	701.150	3.293	704.444	234.50	14.75	3.38	707.82	.00	4.19	5.97	6.000	.000	.00	1 .0
46.583	.0050					.0096	.45	3.29	1.59	4.00	.013	.00	.00	PIPE
2414.581	701.383	3.170	704.553	234.50	15.47	3.72	708.27	.00	4.19	5.99	6.000	.000	.00	1 .0
43.175	.0050					.0109	.47	3.17	1.71	4.00	.013	.00	.00	PIPE

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                         Program Package Serial Number: 7028
                                     WATER SURFACE PROFILE LISTING              Date: 7- 7-2023  Time: 1:39:53
                   265.24.22
                     WSPG RUN FOR SCHAEFER AVENUE (SR83)
                       FN: SCHAEFER.WSW
************************************************************************************************************************** ********
         | Invert  |  Depth |  Water   |    Q     |  Vel    Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev    |  (CFS)   | (FPS)   Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |          |          |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2457.756  701.599   3.052   704.651    234.50   16.23    4.09   708.74     .00    4.19     6.00    6.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  40.346    .0050                                       .0124      .50    3.05    1.84    4.00     .013      .00   .00  PIPE
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2498.102  701.800   2.940   704.740    234.50   17.02    4.50   709.24     .00    4.19     6.00    6.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  37.948    .0050                                       .0140      .53    2.94    1.98    4.00     .013      .00   .00  PIPE
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2536.050  701.990   2.833   704.823    234.50   17.85    4.95   709.77     .00    4.19     5.99    6.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
TRANS STR   .4326                                       .0097      .05    2.83    2.12             .013      .00   .00  PIPE
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2540.720  704.010   4.193   708.203    234.50   11.11    1.92   710.12     .00    4.19     5.51    6.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2540.720  704.010   3.916   707.926    234.50   18.76    5.46   713.39     .00    3.92     1.14    4.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   1.424    .0050                                       .0247      .04    3.92    1.00    4.00     .013      .00   .00  PIPE
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2542.144  704.017   4.000   708.017    234.50   18.66    5.41   713.42     .00    3.92      .00    4.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  70.956    .0050                                       .0261     1.85    4.00     .00    4.00     .013      .00   .00  PIPE
         |         |        |          |          |              |         |       |        |        |       |       |      |
 2613.100  704.370   5.538   709.908    234.50   18.66    5.41   715.32     .00    3.92      .00    4.000    .000   .00   1   .0
       -|-      -|-      -|-       -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
```

APPENDIX A.3: LINE B WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR LINE B
T3 FN: LINEB.WSW
SO   1017.100 664.990  1                          675.322
R    1065.020 665.230  1      .013                                     .000    .000 0
R    1107.900 665.440  1      .013                                   54.597    .000 0
SH   1107.900 665.440  1                          665.440
CD   1  4   1    .000   8.000     .000  .000  .000   .00
Q           289.000   .0
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FILE: LINEB.WSW                               W S P G W - CIVILDESIGN Version 14.07                                    PAGE    1
                                        Program Package Serial Number: 7028
                                                              WATER SURFACE PROFILE LISTING               Date: 5-10-2023  Time: 2:53:54
                                  265.24.22
                                    WSPG RUN FOR LINE B
                                      FN: LINEB.WSW
************************************************************************************************************************** ********
         | Invert  |  Depth  |  Water   |    Q     |  Vel     Vel  |  Energy  |  Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)   |  Elev    |  (CFS)   | (FPS)    Head |  Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-       -|-        -|-        -|-      -|-     -|-        -|-      -|-       -|-      -|-      -|-      -|-    -|
 L/Elem  |Ch Slope |         |          |          |          SF Ave|   HF     |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |               |          |        |        |        |       |       |      |
 1017.100  664.990   10.332   675.322    289.00    5.75      .51   675.84      .00     4.29      .00    8.000    .000    .00   1   .0
        -|-       -|-       -|-        -|-        -|-      -|-     -|-        -|-      -|-       -|-      -|-      -|-      -|-    |-
   47.920   .0050                                         .0010      .05     10.33      .00     3.75    .013      .00    .00  PIPE
         |         |        |         |         |               |          |        |        |        |       |       |      |
 1065.020  665.230   10.140   675.370    289.00    5.75      .51   675.88      .00     4.29      .00    8.000    .000    .00   1   .0
        -|-       -|-       -|-        -|-        -|-      -|-     -|-        -|-      -|-       -|-      -|-      -|-      -|-    |-
   42.880   .0049                                         .0010      .04       .00      .00     3.78    .013      .00    .00  PIPE
         |         |        |         |         |               |          |        |        |        |       |       |      |
 1107.900  665.440   10.053   675.493    289.00    5.75      .51   676.01      .00     4.29      .00    8.000    .000    .00   1   .0
        -|-       -|-       -|-        -|-        -|-      -|-     -|-        -|-      -|-       -|-      -|-      -|-      -|-    |-
```

APPENDIX A.4: LINE C WSPG MODEL

```
T1 265.24.22
T2 WSPG RUN FOR LINE C
T3 FN: LINEC.WSW
SO   1016.150 692.890  1                           702.544
R    1079.620 693.210  1      .013                                    .000    .000 0
R    1122.560 693.420  1      .013                                  54.597    .000 0
SH   1122.560 693.420  1                           693.420
CD   1  4   1    .000   7.500     .000  .000  .000   .00
Q           234.500   .0
```

FILE: LINEC.WSW W S P G W - CIVILDESIGN Version 14.07 PAGE 1

Program Package Serial Number: 7028

WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time: 2:54: 0

265.24.22

WSPG RUN FOR LINE C

FN: LINEC.WSW

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
1016.150	692.890	9.654	702.544	234.50	5.31	.44	702.98	.00	3.92	.00	7.500	.000	.00	1 .0
63.470	.0050					.0009	.06	9.65	.00	3.44	.013	.00	.00	PIPE
1079.620	693.210	9.393	702.603	234.50	5.31	.44	703.04	.00	3.92	.00	7.500	.000	.00	1 .0
42.940	.0049					.0009	.04	.00	.00	3.47	.013	.00	.00	PIPE
1122.560	693.420	9.291	702.711	234.50	5.31	.44	703.15	.00	3.92	.00	7.500	.000	.00	1 .0

EXCERPTS

EXCERPT A: CITY OF ONTARIO MASTER DRAINAGE PLAN HYDROLOGY MAP


XIV
XIII
XII
XI
X
XV
FONTANA
RIVERSIDE DR
GROVE AVE BASIN
LOWER CUCAMONGA SPREADING GROUNDS
CHRIS BASIN
EUCLID MIXED USE SPECIFIC PLAN ONISTE PROJECT SITE
ARCHIBALD AVE
CUCAMONGA CHANNEL
COUNTY LINE CHANNEL
AIRPORT CHANNEL
GROVE AVE STORM DRAIN
CHINO LINE A
CAMP - VIII - 2
BNVW-VIII-2
CUCA-VIII-2
WLKR-IV-2
BAKR - IV - 1
RVSD - IV - 1
OFF-SITE FLOWS Q100=524cfs
LEGEND
COUNTY LIMITS
CITY LIMITS
PLANNED STORM DRAIN, SIZE AND LINE ID
DRAINAGE AREA BOUNDARY
DRAINAGE SYSTEM BOUNDARY
MINOR DRAINAGE BOUNDARY
EXISTING CITY STORM DRAIN AND SIZE (IN INCHES)
EXISTING COUNTY OPEN CHANNEL
EXISTING COUNTY STORM DRAIN AND SIZE (IN INCHES)
DRAINAGE AREA #
DRAINAGE SYSTEM NAME
WLKR - XII - 3
SYSTEM IDENTIFICATION
DRAINAGE AREA NUMBER
LINE NUMBER
AREA DESIGNATION
AREA ACREAGE (IN ACRES)
Q10 =861.0cfs
Q25 =981.1cfs
Q100=1213.7cfs
t=36.1
A=942.7ac
PEAK FLOW RATE
TIME OF CONCENTRATION
AREA
EXISTING DOUBLE 10'W x 6'H RCB
SCALE: 1" = 800'
GRAPHIC SCALE 1"=800'
DATE | REV. | DESCRIPTION
06-2017 | 1 | REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016
REVISIONS
5-20-2017: REVISED TO MERGE DRAINAGE AREA XII AND XIII.
MARCH 2012
CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
HYDROLOGY MAP
NEW MODEL COLONY
HUNSAKER & ASSOCIATES
I R V I N E , I N C.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 PH: (949) 583-1010 FX: (949) 583-0759
SHEET 3 OF 3
PLOTTED 12/12/2017 1:53 PM
\\TUSFS1\HFIProject\140152\Eng\140152-0000\Hm\Hydrology Report\MPD Update\Civil 3D Files\New Model Hydrology Map Update.dwg

EXCERPT B: CITY OF ONTARIO MASTER DRAINAGE PLAN PLANED FACILITIES MAP

F:\0641\Engineering\SY_SD Master Plan\Rpt_SD Master Plan\Exh 8 – PLANNED FACILITIES.dwg

EXCERPT C: STORM DRAIN IMPROVEMENT PLAN FOR PM-20016 EUCLID AVENUE (SR83) FROM 3350' SOUTH MERRILL AVENUE TO EUCALYPTUS AVENUE

STORM DRAIN IMPROVEMENT PLAN
FOR
PM-20016
EUCLID AVENUE (SR83)
FROM 3350' SOUTH MERRILL AVENUE TO EUCALYPTUS AVENUE
IN THE CITY OF ONTARIO

CITY OF ONTARIO GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AND CALTRANS PERMIT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS REFERRED TO SECTION 7-10.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION."

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

BASIS OF BEARING

BEARINGS ARE BASED UPON THE CENTERLINE OF EUCLID AVENUE BEING N89°26'19"E AS SHOWN ON RECORD OF SURVEY 92/97 RECORDED AS INSTRUMENT NO. 1991-447293 OF OFFICIAL RECORDS OF THE COUNTY OF SAN BERNARDINO.

811 Know what's below. Call 811 before you dig.

UTILITY PURVEYORS:

CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA EDISON
24-HOUR EMERGENCY: (800) 611-1911

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

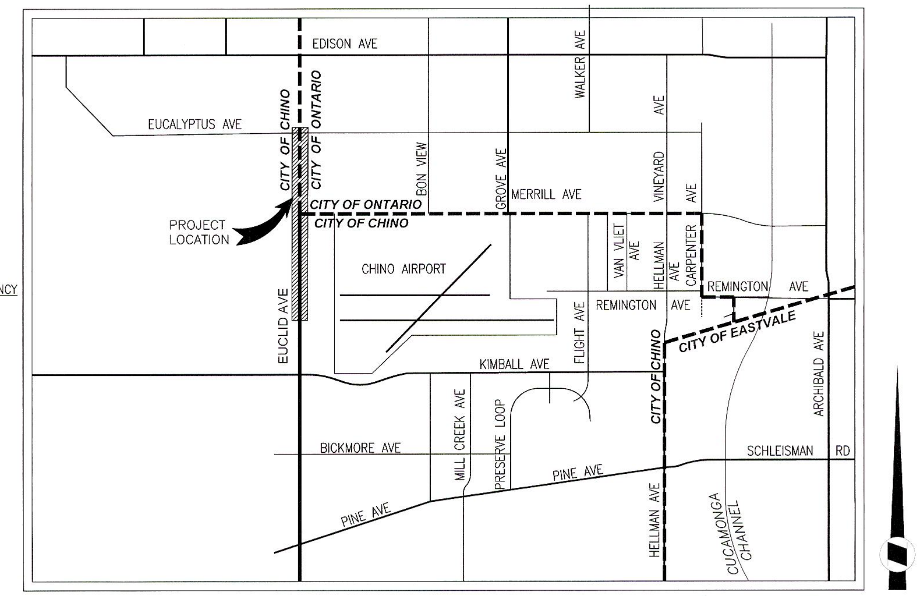
TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOTS 1, 2, 3, 16, 17, 18, 19, 20, 21, 34, 35 AND 36 IN SECTION 19, TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO MAP OF SUBDIVISION OF PART OF THE RANCHO SANTA ANA DEL CHINO, RECORDED IN BOOK 6, PAGE 15 OF MAPS, RECORDS OF SAID COUNTY.



VICINITY MAP
N.T.S.

INDEX OF DRAWINGS

INDEX NO.	DESCRIPTION
SHEET 1	TITLE SHEET
SHEET 2	SHEET INDEX AND TYPICAL SECTIONS
SHEET 3	EUCLID AVENUE – FROM MERRILL AVE TO 912' NORTH OF MERRILL AVE
SHEET 4	EUCLID AVENUE – FROM 912' TO 1812' NORTH OF MERRILL AVE
SHEET 5	EUCLID AVENUE – FROM 1812' NORTH OF MERRILL AVE TO EUCALYPTUS AVE
SHEET 6	EUCLID AVENUE – FROM 2171' TO 3071' NORTH OF KIMBALL AVE
SHEET 7	EUCLID AVENUE – FROM 3071' NORTH OF KIMBALL AVE TO 1310' SOUTH OF MERRILL AVE
SHEET 8	EUCLID AVENUE – FROM 1310' TO 590' SOUTH OF MERRILL AVE
SHEET 9	EUCLID AVENUE – FROM 590' SOUTH OF MERRILL AVE TO MERRILL AVE
SHEET 10	CDS & UTILITY CROSSING DETAILS
SHEET 11-21	DETAILS

OWNER/DEVELOPER:

REDA
4100 MACARTHUR, SUITE 120
NEWPORT BEACH, CA 92660

CONTACT: JEFF JOHNSTON
PHONE: (949) 945-6809
EMAIL: JJOHNSTON@REDALLC.COM

CIVIL ENGINEER

WESTLAND GROUP INC.
4150 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SIARA R. MACKINNEY, P.E.
PHONE: (909)-403-5647

GEOTECHNICAL ENGINEER:

SOUTHERN CALIFORNIA GEOTECHNICAL
22885 EAST SAVI RANCH PARKWAY, SUITE E
YORBA LINDA, CA 92887

CONTACT: GREGORY K. MITCHELL
PHONE: (714) 685-1115

REFERENCE DRAWINGS

DESCRIPTION	REFERENCE
PROPOSED 8" RECYCLED WATER AT EUCLID AVE	PM 20016 RECYCLED WATER IMPROVEMENT
PROPOSED 16" DOMESTIC WATER AT EUCLID AVE	PM 20016 DOMESTIC WATER IMPROVEMENT PLAN
PROPOSED 36" SEWER AT EUCLID AVE	M-1219 SEWER IMPROVEMENT PLANS
PROPOSED 20" SEWER AT EUCLID AVE	PM 20016 SEWER IMPROVEMENT PLAN

HYDROLOGY LEGEND

Q_{ULT-O} = PEAK FLOW RATE BASED ON THE CITY OF ONTARIO MPD
Q_{ULT-C} = PEAK FLOW RATE BASED ON THE CITY OF CHINO MASTER PLAN UPDATE.
NOTE:
THE CITY OF ONTARIO Q_{ULT-O}=2234.5 FT^3/S COMPARED TO THE CITY OF CHINO Q_{ULT-C}=2196.2 FT^3/S.

$Q_{INTERIM}$ = PEAK FLOW RATE BASED ON CURRENT LAND COVER.

NOTE:
THE CITY OF ONTARIO $Q_{INTERIM}$=900.1 FT^3/S COMPARED TO THE CITY OF CHINO $Q_{INTERIM}$=1142.7 FT^3/S.

H_{ULT-O} BASED ON CITY OF ONTARIO Q_{ULT}
H_{ULT-C} BASED ON CITY OF CHINO Q_{ULT}
$H_{INTERIM}$ BASED ON CITY OF CHINO $Q_{INTERIM}$= 1142.7 FT^3/S.

$V_{ULT-100}$ = FOUND USING $Q_{ULT-100}$.
$V_{INT-100}$ = FOUND USING $Q_{INT-100}$.

CONSTRUCTION NOTES

ITEM	DESCRIPTION	QUANTITY	
1	CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	2531	LF
2	CONSTRUCT 102" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	174	LF
3	CONSTRUCT 90" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	101	LF
4	CONSTRUCT 2-24" TEMPORARY HDPE PIPE, BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20	5550	LF
5	CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20	5	EA
6	CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	38	LF
7	CONSTRUCT PRECAST DBL 10'x10' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 10'X10'- WITH SLOPED INVERT RCB PER CALTRANS STD. D81 & D82. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAILS ON SHEETS 13-18 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	600	LF
8	CONSTRUCT PRECAST 9.5'x9.5' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 9.5'X9.5' INCLUDE V INVERT RCB PER CALTRANS STD. D80. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAIL ON SHEETS 14, 15, 17 AND 19 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET 20	56	LF
9	CONSTRUCT TRANSITION STRUCTURE PIPE TO PIPE PER SPPWC STD. 340-2, DETAIL ON SHEET 14	1	EA
10	CONSTRUCT TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB PER SPPWC STD. 343-2, DETAIL ON SHEET 12	1	EA
11	CONSTRUCT 36" STORM DRAIN MANHOLE SHAFT WITHOUT REDUCER PER SPPWC STD. 326-2, DETAIL ON SHEET 11	5	EA
12	CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN	4	EA
13	CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.	4	EA
14	CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11	3	EA
15	CONSTRUCT RCB WINDOW PER SPPWC STD 382-2, DETAIL ON SHEET 21	1	EA
16	CONSTRUCT RCB STAND PIPE OUTLET RISER PER DETAIL16 ON SHEET 11	36	EA
17	CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	260	LF
18	INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11	4	EA
19	CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16	10	EA
20	CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11	4	EA
21	INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT	4	EA
22	CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15	6	EA
23	CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, DETAIL ON SHEET 13	1	EA
24	CONSTRUCT RIP-RAP PER SAN DIEGO REGIONAL STD. DWG. D-40 DETAIL ON SHEET 12	60	CY
25	CONSTRUCT ENDWALL PER DETAIL 25 ON SHEET 18	1	EA
26	CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19	9	EA
27	CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12	4	EA
28	CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17	10	EA
29	CONSTRUCT 24" TEMPORARY HDPE 45° BEND	4	EA
30	CONSTRUCT 12" RCP CONCRETE COLLAR PER SPPWC STD. 380-4, DETAIL ON SHEET 21	1	EA
31	CONSTRUCT CDS UNIT, SIZE PER PLAN PER DETAIL 31 ON SHEET 21	3	EA
32	CONSTRUCT 24" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20	20	LF
33	INSTALL SURVEY MONITORING POINTS AND SETTLEMENT ROD PER CALTRANS TR-0151 AND TR-0152 ON SHEET 18	2	EA

CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.
2. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY AND NOT BE LIMITED TO A NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER, OR ANY PUBLIC AGENCY.
3. THE ESTIMATES OF IMPROVEMENT QUANTITIES AS SHOWN HEREON ARE PROVIDED ONLY FOR THE PURPOSE OF SATISFYING DISTRICT PLAN INFORMATION REQUIREMENTS. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES AND SHALL USE SAME AS A BASIS FOR HIS BID(S) AND CONTRACT(S).
4. CONTRACTOR TO VERIFY CLEARANCE AT ALL UTILITY CROSSINGS. IF INTERFERENCE OCCURS, OTHER THAN NOTED ON PLAN, CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR POSSIBLE REDESIGN. IF REDESIGN IS NOT FEASIBLE, CONTRACTOR TO RELOCATE UTILITY AT NO EXPENSE TO ENGINEER.
5. CONTRACTOR SHALL TAKE EXTREME CARE DURING STORM DRAIN CONSTRUCTION AND IS RESPONSIBLE FOR TRENCHING AND SHORING. CONTRACTOR SHALL SUBMIT A DETAILED SHORING PLAN PER SECTION 7-10.4.2.2 OF SPPWC AND A PERMIT FROM STATE DIVISION OF INDUSTRIAL SAFETY PRIOR TO COMMENCING WORK.
6. CONTRACTOR SHALL VERIFY PAVEMENT ELEVATION AT RIM PRIOR TO SETTING CONE.

LEGEND OF SYMBOLS

(100)	EXISTING CONTOURS
100	PROP. CONTOUR
	EXIST. EASEMENT
2%	FLOW RATE
	CENTERLINE
	FIRE HYDRANT
	SIGN
	PROPOSED STORM DRAIN MH
	PROPOSED CATCH BASIN
	PROPOSED STORM DRAIN
	BOUNDARY LINE
	FENCE LINE
	STREET LIGHT

LEGEND OF ABBREVIATIONS

BC	BEGIN CURVE	LT	LEFT
BCR	BEGIN CURB RETURN	LP	LOW POINT
BNDY	BOUNDARY	MIN	MINIMUM
C+G	CURB AND GUTTER	PCC	POINT OF COMPOUND CURVE
CB	CATCH BASIN	ℙ OR P/L OR PL	PROPERTY LINE
CFS	CUBIC FEET PER SECOND	PRC	POINT OF REVERSE CURVE
℄ OR C/L OR CL	CENTERLINE	PVC	POLYVINYL CHLORIDE
DBL	DOUBLE	RCB	REINFORCED CONCRETE BOX
DW	DOMESTIC WATER	RCP	REINFORCED CONCRETE PIPE
EC	END CURVE	RT	RIGHT
ECR	END CURB RETURN	RW	RECYCLED WATER
EP	EDGE OF PAVEMENT	R/W	RIGHT OF WAY
ESMT	EASEMENT	SD	STORM DRAIN
EX, EXIST.	EXISTING	SL	STREET LIGHT
FH	FIRE HYDRANT	SP	STAND PIPE (RCP)
FL	FLOW LINE	SS	SANITARY SEWER
FS	FINISHED SURFACE	SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
FT/S	FEET PER SECOND	STA	STATION
GB	GRADE BREAK	TC	TOP OF CURB
HDPE	HIGH DENSITY POLY ETHYLENE	TYP	TYPICAL
HP	HIGH POINT	ULT	ULTIMATE
INT	INTERIM		
INV	INVERT		

RECOMMENDED FOR ACCEPTANCE
TECK, C. LOH, P.E. 7/13/2022
HARRIS AND ASSOCIATES DATE

CITY OF CHINO
RECOMMENDED BY: 8/8/2022
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK
DATE: 04/26/2022
DRAWN BY: PK/BK
DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

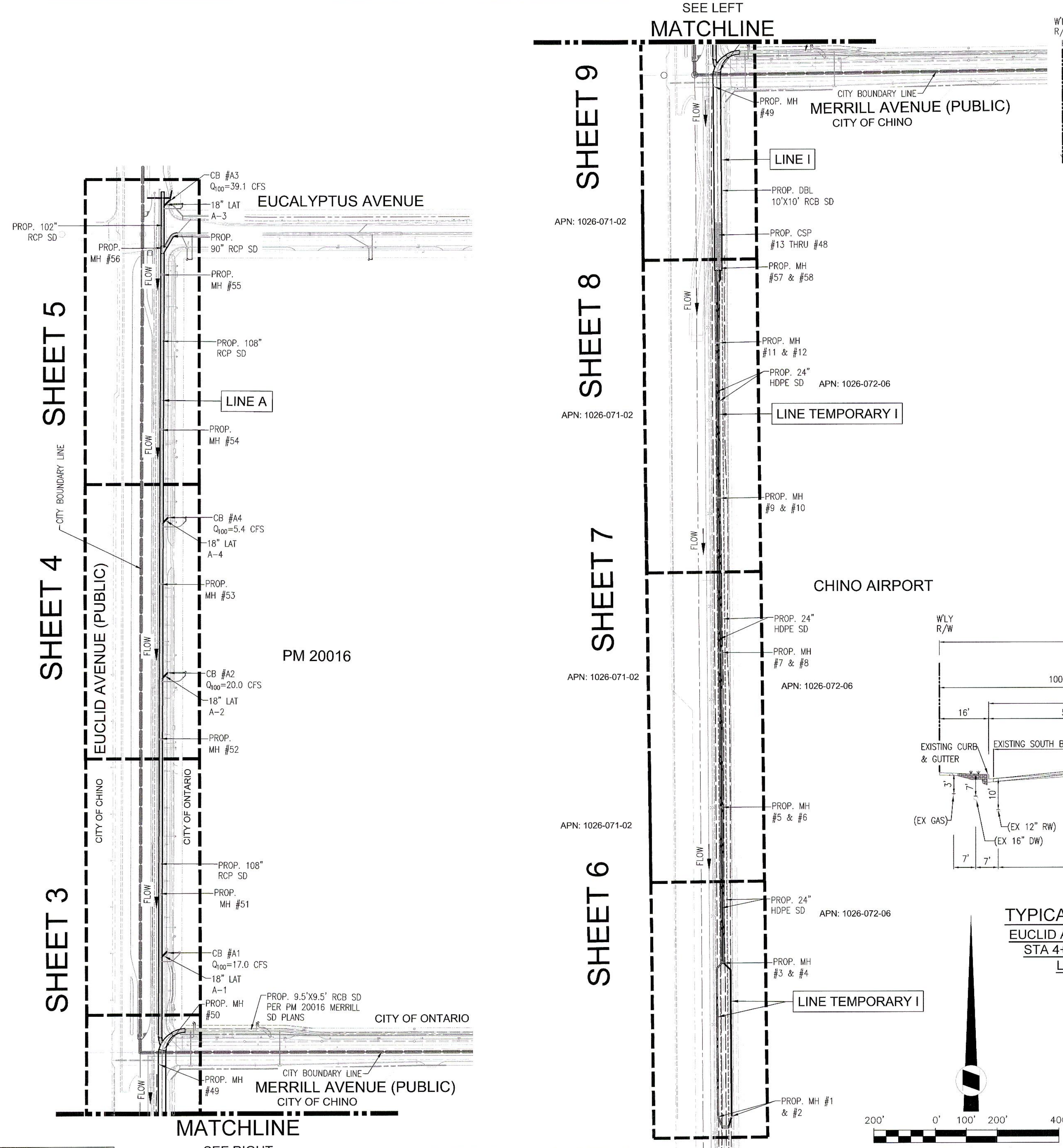
STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
TITLE SHEET

PM-20016

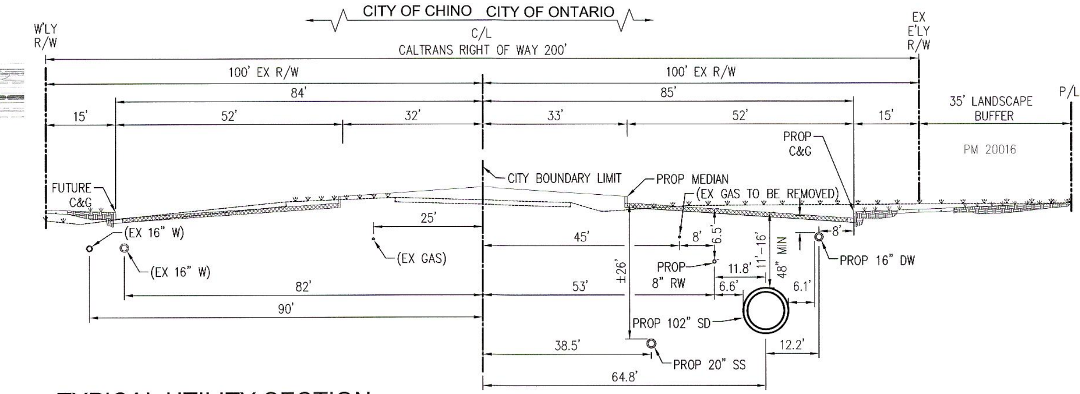
SHEET 1 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14485
AA 59495D

06/16/2022

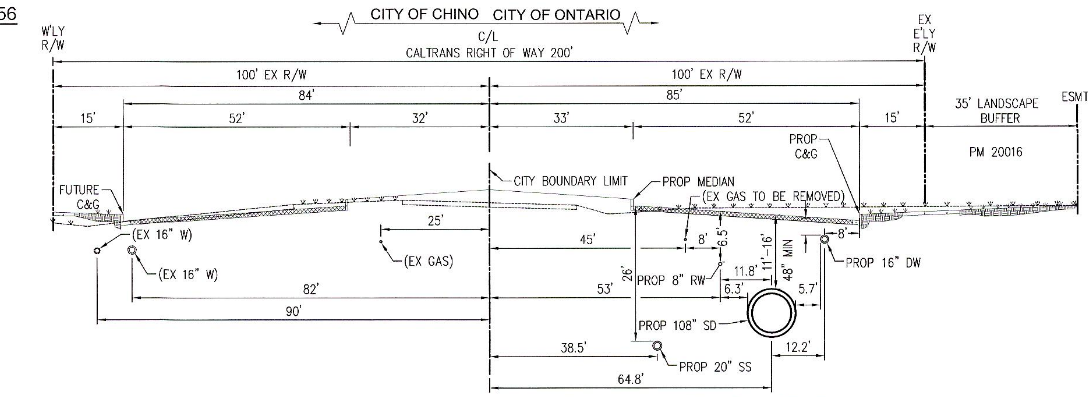
Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\01_2020-015_SD.dwg
Last Opened: Jun 16, 2022 - 3:14pm by: BrentKing



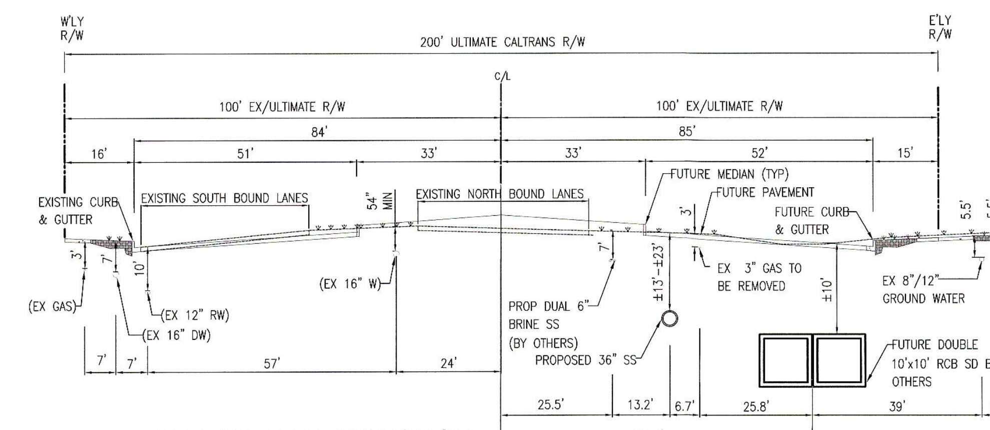
SHEET INDEX/SYSTEM MAP



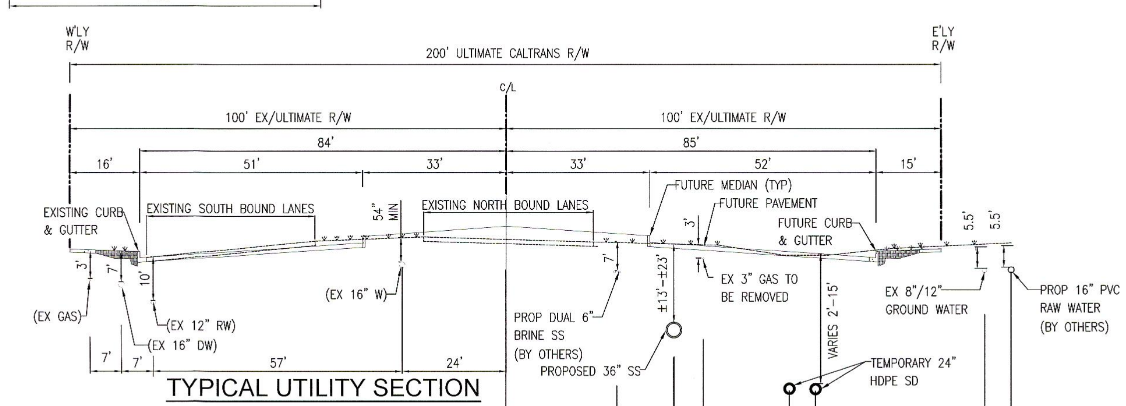
TYPICAL UTILITY SECTION
EUCLID AVENUE
STA 35+87.99 TO STA 37+62.56
LINE A STATIONING
N.T.S.



TYPICAL UTILITY SECTION
EUCLID AVENUE
STA 10+33.24 TO STA 35+64.75
LINE A STATIONING
N.T.S.



TYPICAL UTILITY SECTION
EUCLID AVENUE (CITY OF CHINO)
STA 4+04.72 TO STA 10+03.77
LINE I STATIONING
N.T.S.



TYPICAL UTILITY SECTION
EUCLID AVENUE (CITY OF CHINO)
STA 10+46.32 TO STA 38+19.29
LINE TEMPORARY I STATIONING
N.T.S.

811 Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: [signature] 8/8/22
CITY ENGINEER DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/18/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER 7/18/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA RENE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

SHEET INDEX AND TYPICAL SECTIONS

PM-20016

SHEET 2 OF 21
CONTRACT
ACCOUNT
DWG. NO. D1486
AA 5949 SD

06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\02_2020-015_SD-USM.dwg
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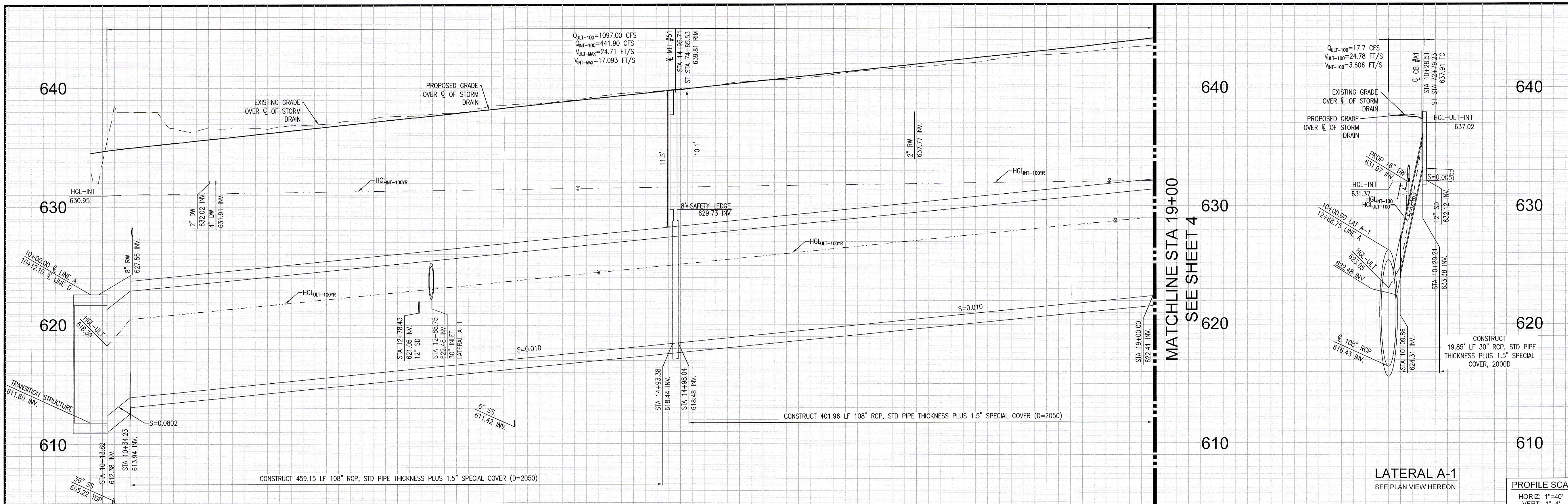

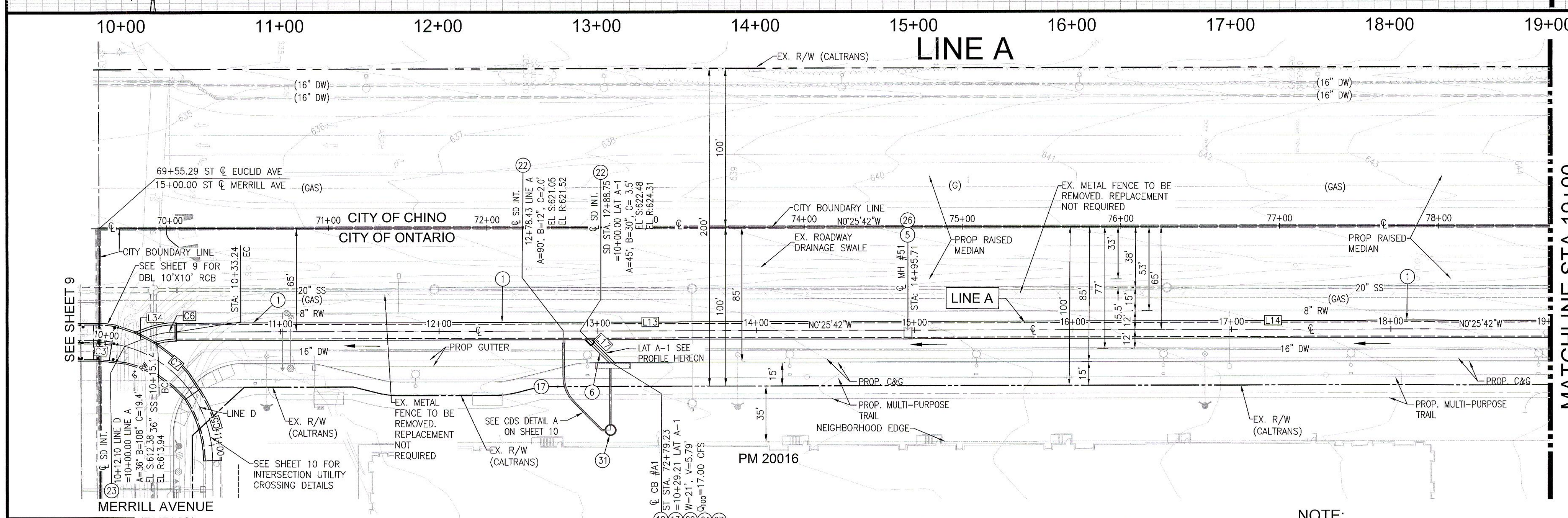

CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
5. CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20
6. CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
12. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
17. CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
20. CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22. CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
23. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, DETAIL ON SHEET 13
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
27. CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12
31. CONSTRUCT CDS UNIT, SIZE PER PLAN PER DETAIL 31 ON SHEET 21

NOTE:

- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
C5	033°39'48.2"	44.07'	75.00'	22.69
C6	020°49'26.7"	16.36'	45.00'	8.27
C7	047°22'56.9"	62.02'	75.00'	32.91
L13	N0°25'42"W	460.14'		
L14	N0°25'42"W	495.34'		
L17	N44°34'18"E	17.93'		

40' 0' 20' 40' 80'
SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

LEGEND
STORM DRAIN FLOW DIRECTION

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

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REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

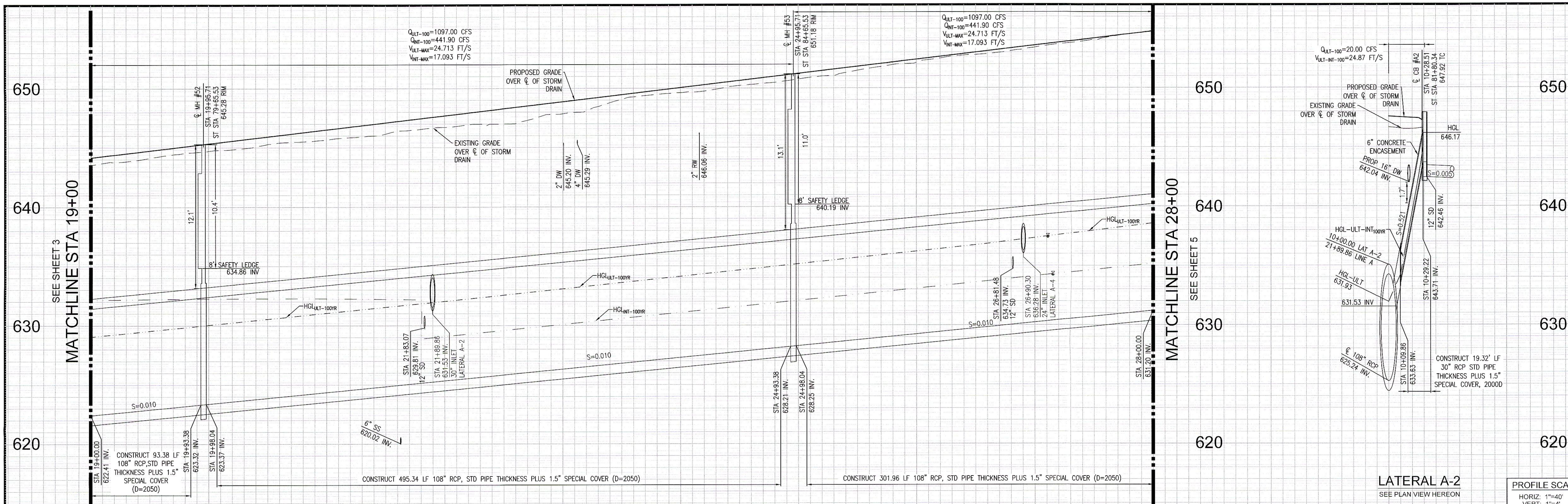
STORM DRAIN IMPROVEMENT PLAN & PROFILE
EUCLID AVENUE
FROM MERRILL AVE TO 912' NORTH OF MERRILL AVE

PM-20016

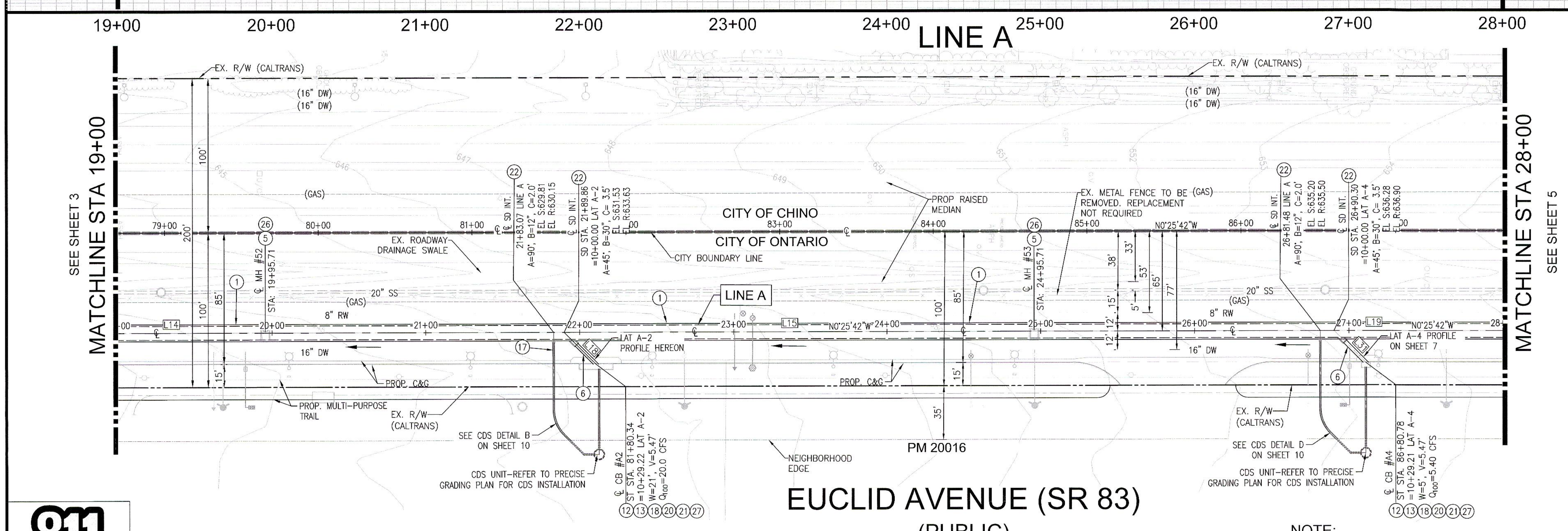
SHEET 3 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14487
AA 5949SD

06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\03_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 2:49pm by: Brent.King



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



CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
5. CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20
6. CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
12. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
17. CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
18. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11
20. CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22. CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
27. CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L14	N0°25'42"W	495.34'		
L15	N0°25'42"W	495.34'		
L18	N44°33'24"E	17.94'		
L19	N0°25'42"W	495.34'		
L31	N44°33'51"E	19.37'		

SCALE: 1" = 40'

NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

STORM DRAIN FLOW DIRECTION

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

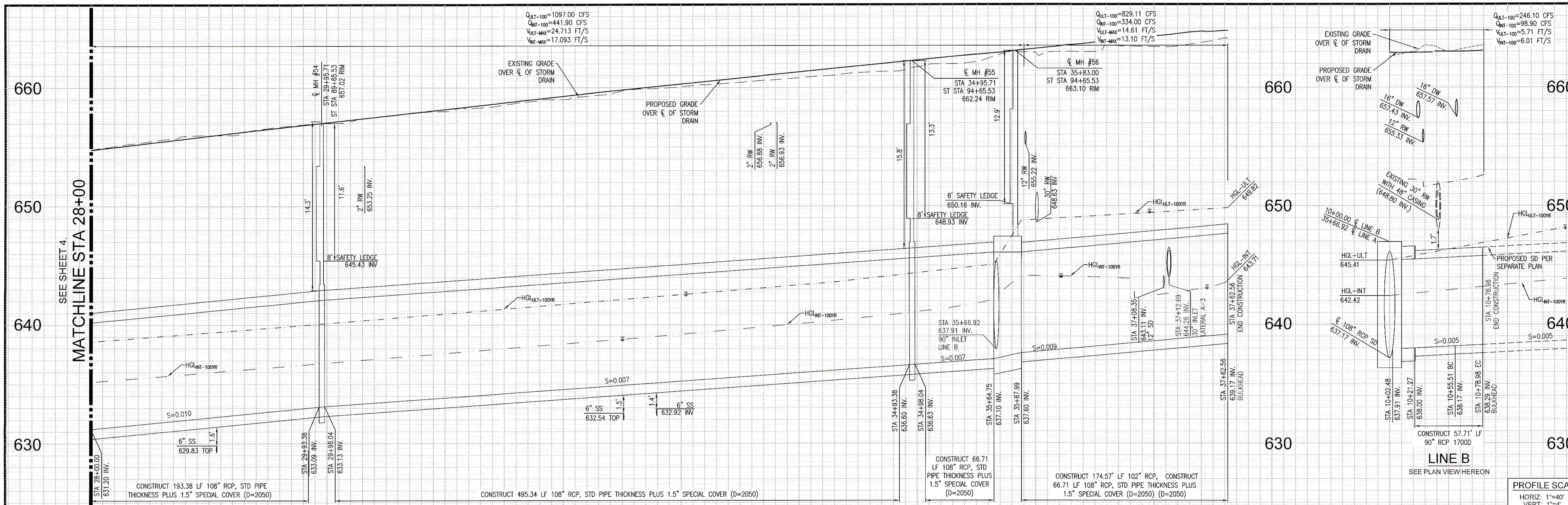
STORM DRAIN IMPROVEMENT PLAN & PROFILE
EUCLID AVENUE
FROM 912' TO 1812' NORTH OF MERRILL AVE

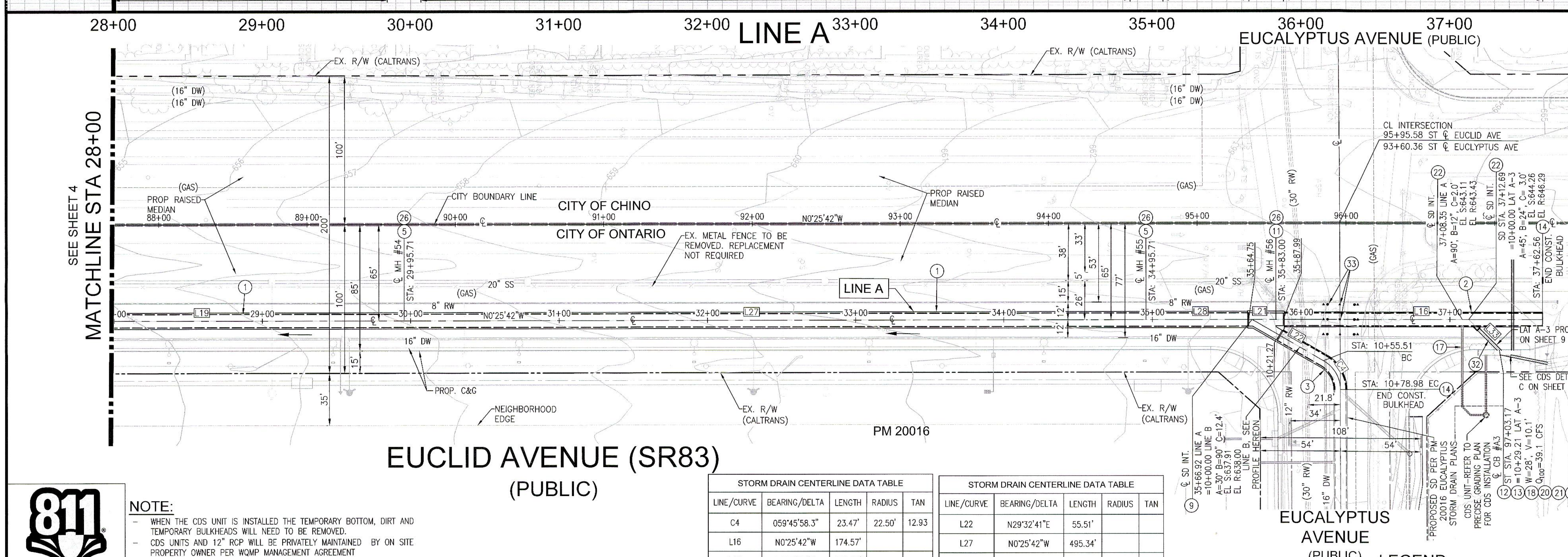
PM-20016

SHEET 4 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14488
AA 5949 SD

06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\04_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 2:55pm by: Brent.King





CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
2. CONSTRUCT 102" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
3. CONSTRUCT 90" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
5. CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 320-2, DETAIL ON SHEET 20
9. CONSTRUCT TRANSITION STRUCTURE PIPE TO PIPE PER SPPWC STD. 340-2, DETAIL ON SHEET 14
11. CONSTRUCT 36" STORM DRAIN MANHOLE SHAFT WITHOUT REDUCER PER SPPWC STD. 326-2, DETAIL ON SHEET 11
12. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
13. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
14. CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
17. CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
18. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11
20. CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
21. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
22. CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
26. CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
27. CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12
32. CONSTRUCT 24" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
33. INSTALL SURVEY MONITORING POINTS AND SETTLEMENT ROD PER CALTRANS TR-0151 AND TR-0152 ON SHEET 18

Know what's below. Call 811 before you dig.

NOTE:
- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
C4	059°45'58.3"	23.47'	22.50'	12.93
L16	N0°25'42"W	174.57'		
L19	N0°25'42"W	495.34'		
L21	N0°25'42"W	28.79'		

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L22	N29°32'41"E	55.51'		
L27	N0°25'42"W	495.34'		
L28	N0°25'42"W	66.72'		
L33	N44°34'18"E	20.20'		

LEGEND

STORM DRAIN FLOW DIRECTION

40' 0' 20' 40' 80'
SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER for 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

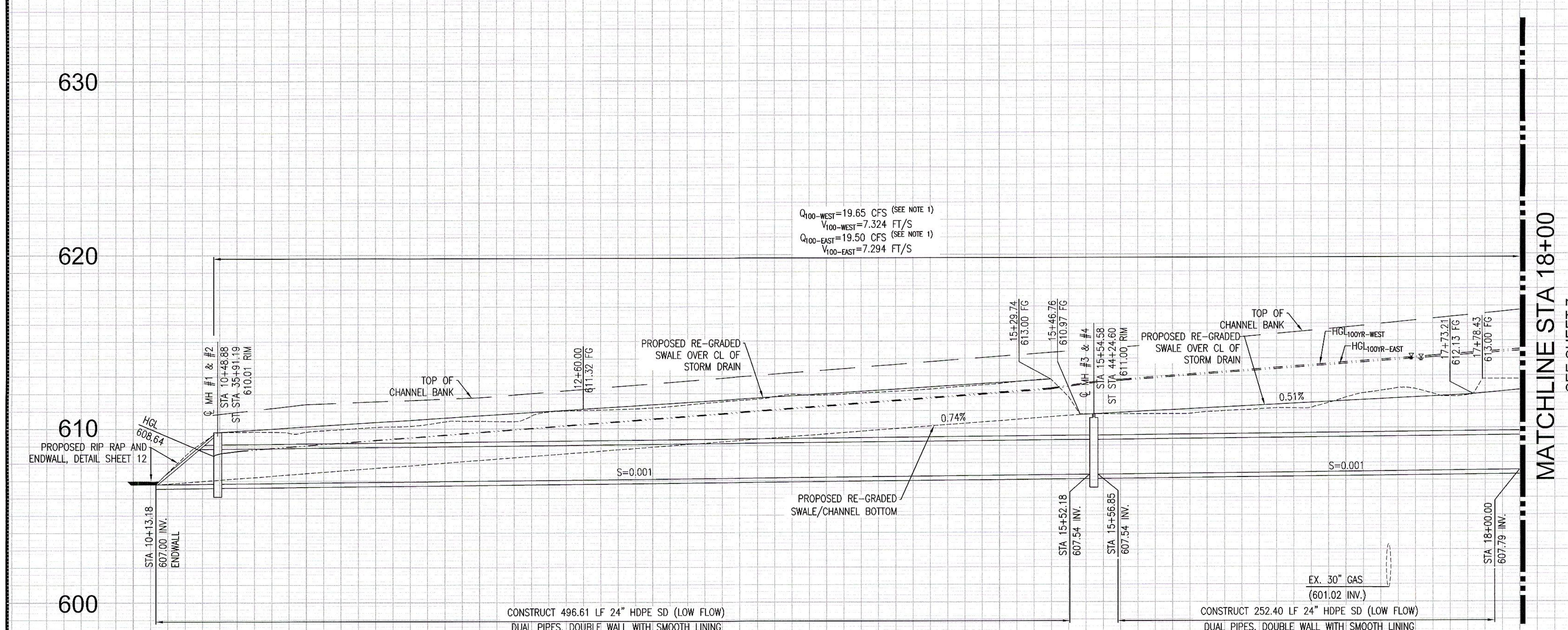
STORM DRAIN IMPROVEMENT PLAN & PROFILE
EUCLID AVENUE
FROM 1812' NORTH OF MERRILL AVE TO EUCALYPTUS AVE

PM-20016

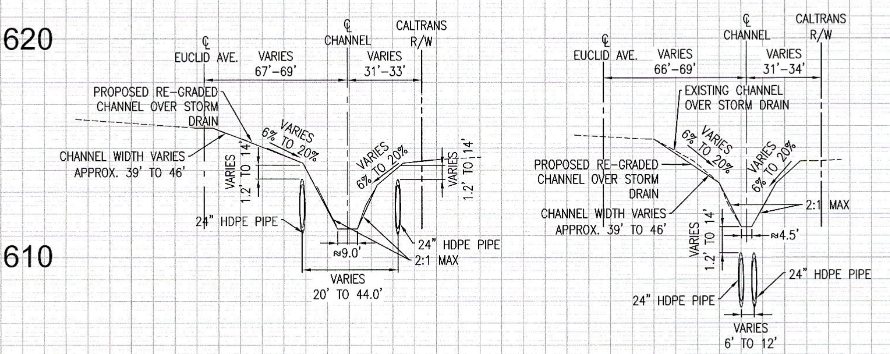
SHEET 5 OF 21
CONTRACT
ACCOUNT
DWG. NO. D14489 AA 5949 SD

06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\05_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 3:03pm by: Brent.King



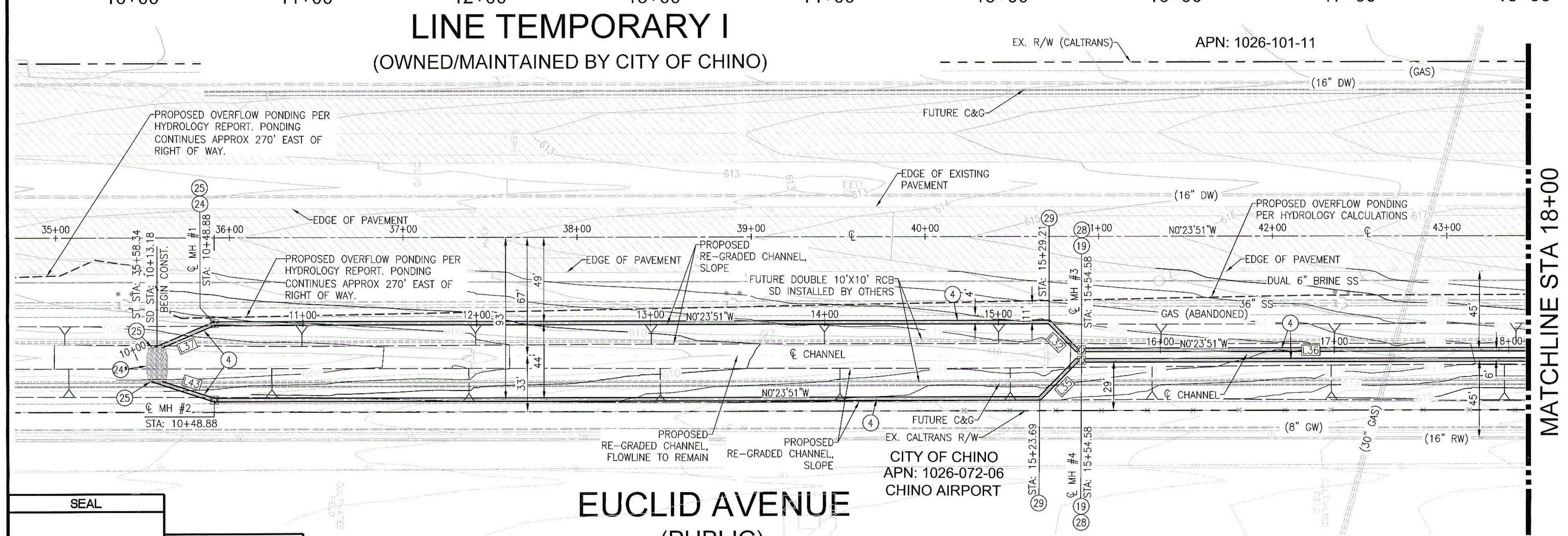
NOTE 1: THE 39 CFS IS BASED ON THE MAXIMUM FLOW RATE THAT CAN BE CONVEYED BY THE DOUBLE 24-INCH STORM DRAIN SYSTEM. THE 39 CFS IN AN INTERIM CONDITION UNTIL SUCH TIME ULTIMATE LINE "I" IS CONSTRUCTED WITHIN THE CITY OF CHINO.



TYPICAL CROSS SECTION
STA: 10+13.18 TO STA: 15+54.58

TYPICAL CROSS SECTION
STA: 15+54.58 TO STA: 38+28.61

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



LINE TEMPORARY I

(OWNED/MAINTAINED BY CITY OF CHINO)

EUCLID AVENUE

(PUBLIC)

CONSTRUCTION NOTES

(4) CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20

(19) CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16

(24) CONSTRUCT RIP-RAP PER SAN DIEGO REGIONAL STD. DWG. D-40 DETAIL ON SHEET 12

(25) CONSTRUCT ENDWALL PER DETAIL 25 ON SHEET 18

(28) CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L32	S45°02'17"W	22.61'		
L35	S45°50'14"E	30.52'		
L36	N0°23'51"W	495.89'		
L37	S23°25'44"E	35.70'		
L43	N17°41'12"E	29.81'		

SEAL

REGISTERED PROFESSIONAL ENGINEER
SIARA ROSE MACKINNEY
No.85559
Exp. 9/30/2022
CIVIL
STATE OF CALIFORNIA

6/22/22

811
Know what's below.
Call 811 before you dig.

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

PAVEMENT LEGEND

EXISTING AC PAVEMENT TO REMAIN

* PROPOSED RIP RAP SHALL BE $\frac{1}{4}$ TON ROCK WITH FOLLOWING GRADATION
$\frac{1}{2}$ TON – 0 TO 5% PASSING
200 LB – 50 TO 100% PASSING
75 LB – 90 TO 100% PASSING

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

STORM DRAIN FLOW DIRECTION

40' 0' 20' 40' 80'
SCALE: 1" = 40'

CALTRANS # 08-22-6-UT-0007

PREPARED BY	REVISIONS	MADE BY	MADE DATE	RECOMMENDED BY	RECOMMENDED DATE
FIRM: WESTLAND GROUP, INC.					
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764					
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660					
SIGNATURE RCE 85559 DATE					

BENCH MARK DATA
BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REFERENCE DRAWINGS

REVIEWED BY STAFF	BY	DATE
WATER:		
SEWER:		
FIRE:		
PLANNING:		
TRAFFIC:		
ENVIRONMENTAL:		

CITY ENGINEER'S STAFF	BY	DATE
DRAWN:		
DESIGNED:		
CHECKED:		
RECOMMENDED:		

RECOMMENDED BY:
CITY ENGINEER
DATE: 8/8/22

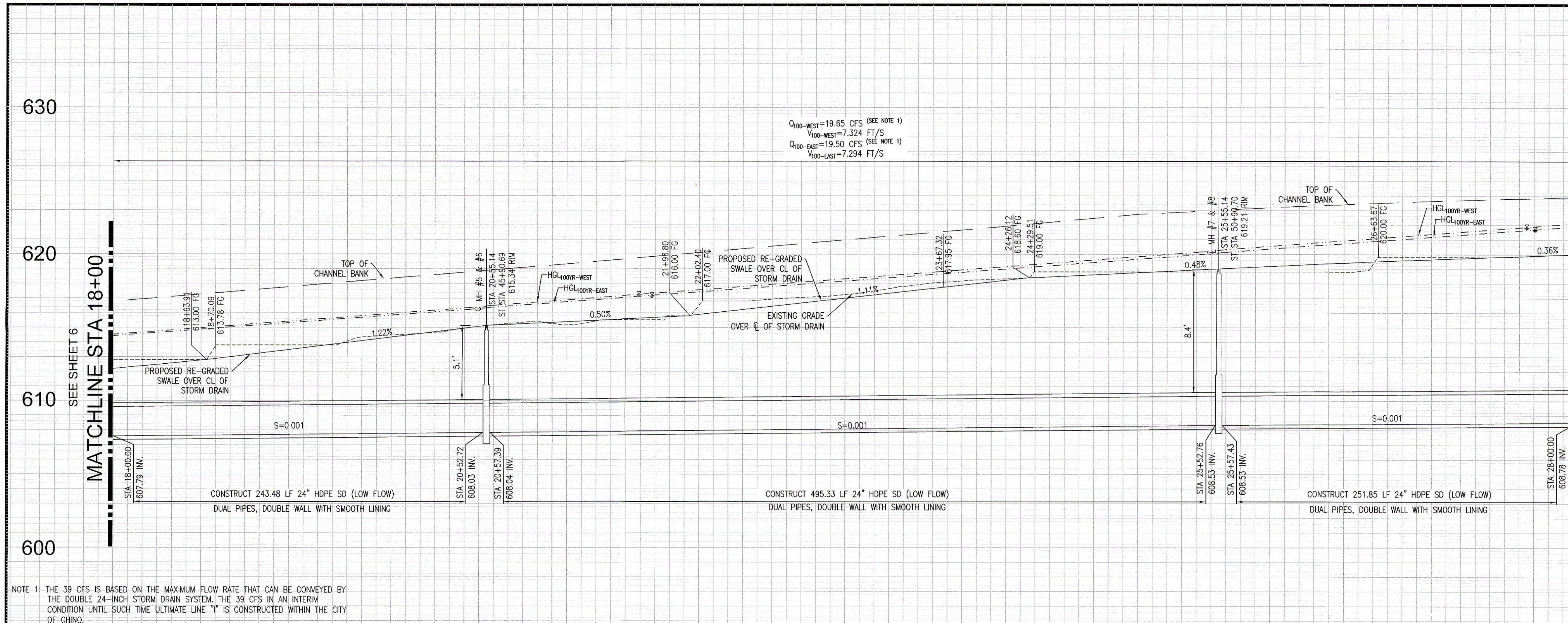
CITY OF CHINO ENGINEERING DIVISION

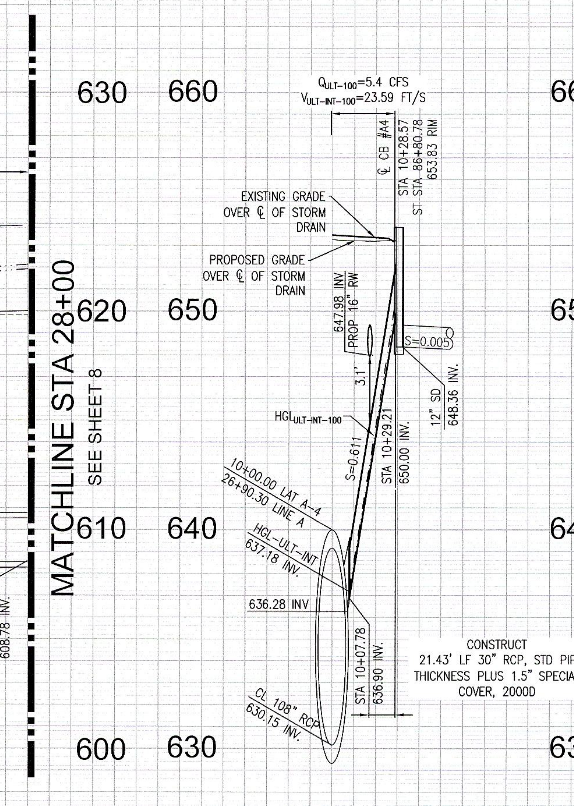
STORM DRAIN IMPROVEMENT PLAN & PROFILE
EUCLID AVENUE
FROM 2171' TO 3071' NORTH OF KIMBALL AVE

PROJECT NO.
PM-20016
SHEET 6 OF 21
DRAWING NO.
AA 5949 SD D14490

06/08/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 08, 2022 - 5:22pm by: Brent.King





LATERAL A-4

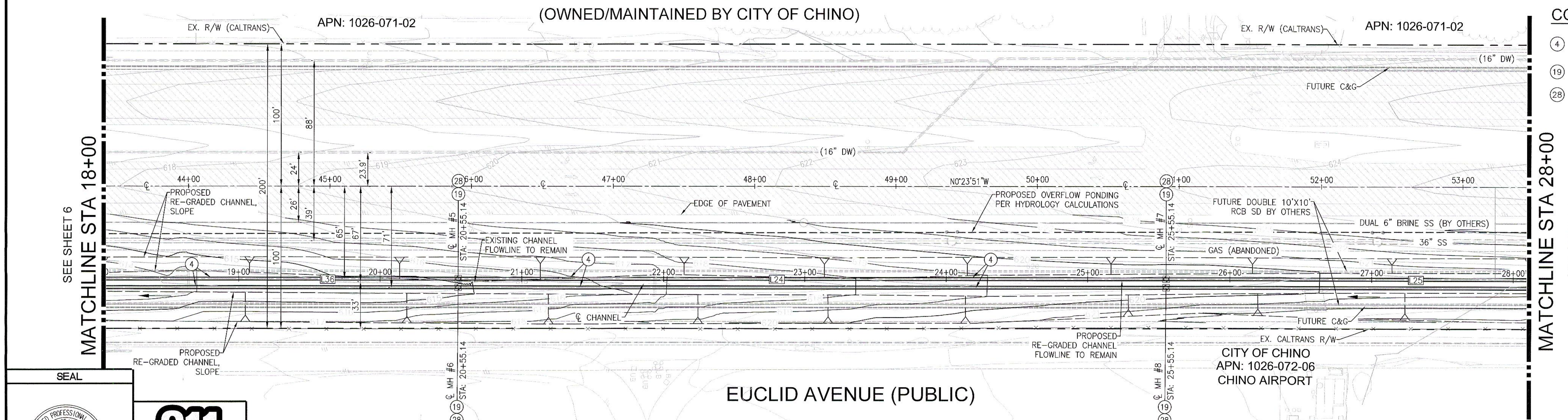
SEE PLAN VIEW SHEET 4

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

NOTE 1: THE 39 CFS IS BASED ON THE MAXIMUM FLOW RATE THAT CAN BE CONVEYED BY THE DOUBLE 24-INCH STORM DRAIN SYSTEM. THE 39 CFS IN AN INTERIM CONDITION UNTIL SUCH TIME ULTIMATE LINE "I" IS CONSTRUCTED WITHIN THE CITY OF CHINO.

LINE TEMPORARY I

(OWNED/MAINTAINED BY CITY OF CHINO)



CONSTRUCTION NOTES

(4) CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20

(19) CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16

(28) CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17

STORM DRAIN CENTERLINE DATA TABLE				
LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L24	N0°23'51"W	495.34'		
L25	N0°23'51"W	495.33'		
L36	N0°23'51"W	495.89'		

SCALE: 1" = 40'

PAVEMENT LEGEND

EXISTING AC PAVEMENT TO REMAIN

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

STORM DRAIN FLOW DIRECTION

CALTRANS # 08-22-6-UT-0007

SEAL

No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

6/22/22

Know what's below. Call 811 before you dig.

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY P.E., ASSISTANT CITY ENGINEER — DATE 7/20/22

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 7/20/22

PREPARED BY	
FIRM: WESTLAND GROUP, INC.	
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764	
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660	
SIGNATURE RCE 85559	DATE

REVISIONS | MADE BY DATE | RECOMMENDED BY DATE

BENCH MARK DATA
BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REFERENCE DRAWINGS

REVIEWED BY STAFF	BY	DATE
WATER:		
SEWER:		
FIRE:		
PLANNING:		
TRAFFIC:		
ENVIRONMENTAL:		

CITY ENGINEER'S STAFF	BY	DATE
DRAWN:		
DESIGNED:		
CHECKED:		
RECOMMENDED:		

RECOMMENDED BY:
CITY ENGINEER
DATE: 8/8/22

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE

FROM 3071' NORTH OF KIMBALL AVE TO 1310' SOUTH OF MERRILL AVE

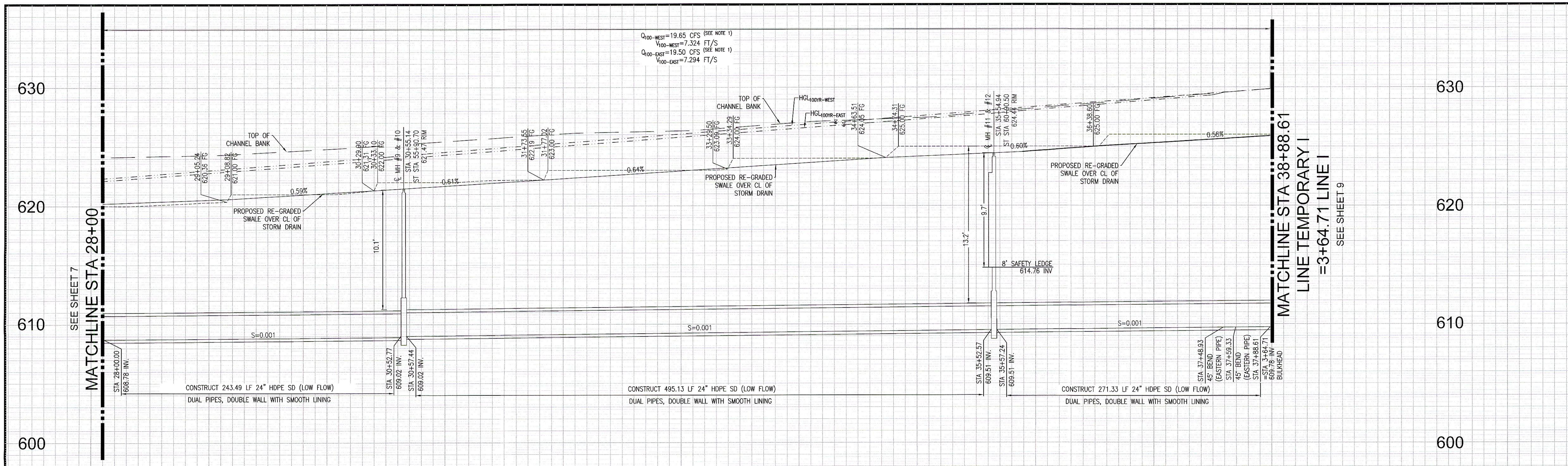
PROJECT NO. PM-20016

SHEET 7 OF 21

DRAWING NO. AA 5949-SD

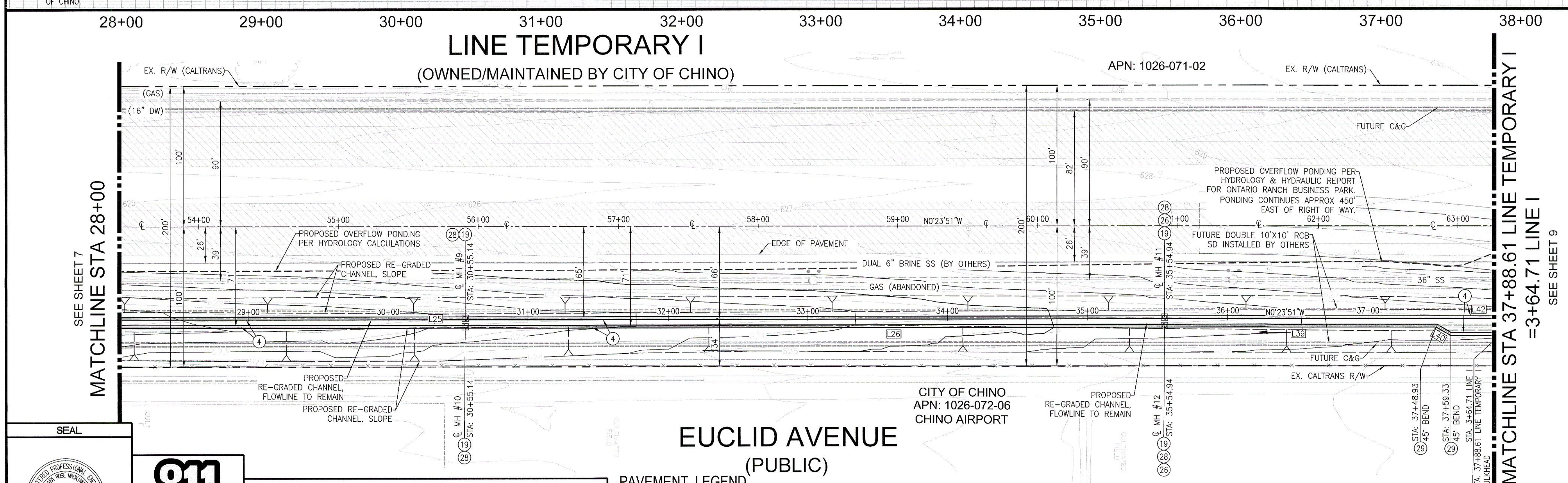
06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 9:03am by: Brent.King



NOTE 1: THE 39 CFS IS BASED ON THE MAXIMUM FLOW RATE THAT CAN BE CONVEYED BY THE DOUBLE 24-INCH STORM DRAIN SYSTEM. THE 39 CFS IN AN INTERIM CONDITION UNTIL SUCH TIME ULTIMATE LINE "I" IS CONSTRUCTED WITHIN THE CITY OF CHINO.

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



CONSTRUCTION NOTES

- (4) CONSTRUCT 2-24" TEMPORARY HDPE PIPE. BEDDING & BACKFILL PER DETAIL 4 ON SHEET 11, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET ON 20
- (14) CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
- (19) CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD 321-2, DETAIL ON SHEET 16
- (26) CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19
- (28) CONSTRUCT PRESSURE MANHOLE SHAFT AND PRESSURE PLATE, PER SPPWC 329-2, DETAIL ON SHEET 17
- (29) CONSTRUCT 24" TEMPORARY HDPE 45° BEND

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L25	N0°23'51"W	495.33'		
L26	N0°23'51"W	495.13'		
L39	N0°23'51"W	191.66'		
L40	N29°36'09"E	12.00'		
L41	N0°23'51"W	69.28'		
L42	N0°23'51"W	271.33'		

SCALE: 1" = 40'

SEAL

No.85559
Exp. 9/30/2022
CIVIL
STATE OF CALIFORNIA
6/22/22

Know what's below. Call 811 before you dig.

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

PAVEMENT LEGEND

PROPOSED AC PAVEMENT PER SEP. PLAN

EXISTING AC PAVEMENT TO REMAIN

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

LEGEND

STORM DRAIN FLOW DIRECTION

CALTRANS # 08-22-6-UT-0007

PREPARED BY
FIRM: WESTLAND GROUP, INC.
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE RCE 85559 DATE

REVISIONS | MADE BY DATE | RECOMMENDED BY DATE

BENCH MARK DATA
BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REFERENCE DRAWINGS

REVIEWED BY STAFF	BY	DATE	CITY ENGINEER'S STAFF	BY	DATE
WATER:			DRAWN:		
SEWER:			DESIGNED:		
FIRE:			CHECKED:		
PLANNING:			RECOMMENDED:		
TRAFFIC:					
ENVIRONMENTAL:					

RECOMMENDED BY:
CITY ENGINEER
DATE: 8/8/22

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE
FROM 1310' TO 590' SOUTH OF MERRILL AVE

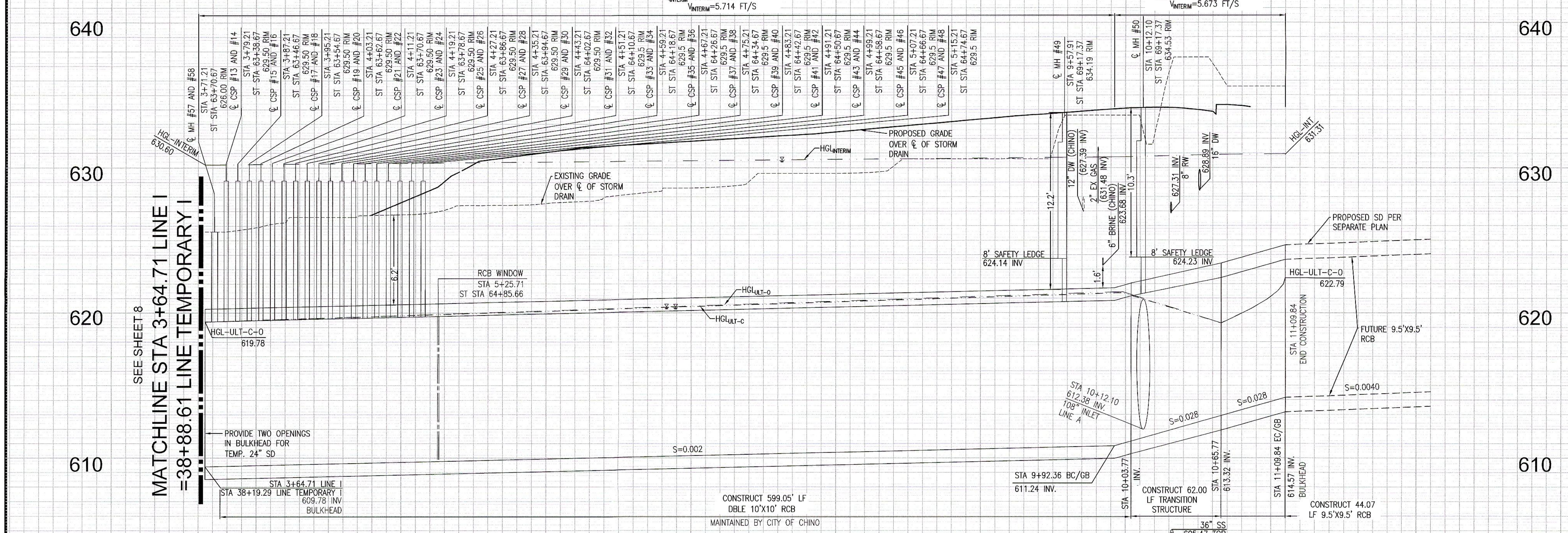
PROJECT NO. PM-20016
SHEET 8 OF 21
DRAWING NO. AA 5949 SD
B14492
06/16/2022

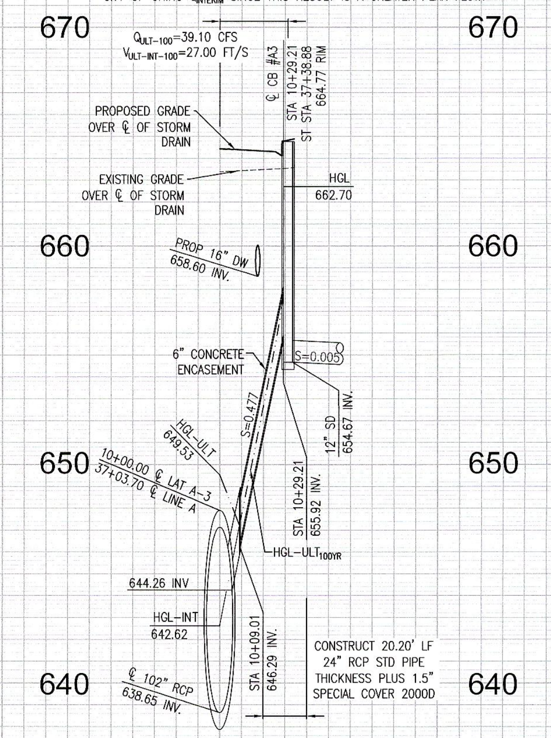
Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 - 9:05am by: Brent.King

Q_{ULT-O}: PEAK FLOW RATE BASED ON CITY OF ONTARIO MDP
V_{ULT-O}: MAX VELOCITY BASED ON CITY OF ONTARIO MDP PEAK Q
HGL_{ULT-O}: HGL BASED ON CITY OF ONTARIO MDP PEAK Q
Q_{ULT-C}: PEAK FLOW RATE BASED ON CITY OF ONTARIO MDP
V_{ULT-C}: MAX VELOCITY BASED ON CITY OF ONTARIO MDP PEAK Q
$Q_{INTERIM}$: INTERIM PEAK FLOW BASED ON CURRENT LAND USE COVER
$V_{INTERIM}$: MAX VELOCITY BASED ON INTERIM PEAK FLOW RATE

NOTE 2: THE PEAK FLOW RATE FOR LINE "I" BASED ON THE CITY OF ONTARIO MDP IS Q_{ULT-O}=2,234.5 CFS. THE PEAK FLOW RATE FOR LINE "I" BASED ON THE CITY OF CHINO MDP IS Q_{ULT-C}=2,196.2 CFS. THE HGL SHOWN ON THE PLANS PERTAIN TO THE PEAK FLOW RATES PROVIDED BY THE CITY OF ONTARIO AND CITY OF CHINO.

NOTE 3: $Q_{INTERIM}$ IS BASED ON PEAK FLOW RATE USING CURRENT LAND COVER USING AN AERIAL IMAGE DATED 8/2021. THE CITY OF ONTARIO $Q_{INTERIM}$=900.1 CFS. THE CITY OF CHINO $Q_{INTERIM}$=1,142.7. THE $HGL_{INTERIM}$ SHOWN ON THE PLANS IS BASED ON THE CITY OF CHINO $Q_{INTERIM}$ SINCE THIS RESULT IS A GREATER PEAK FLOW.





LATERAL A-3

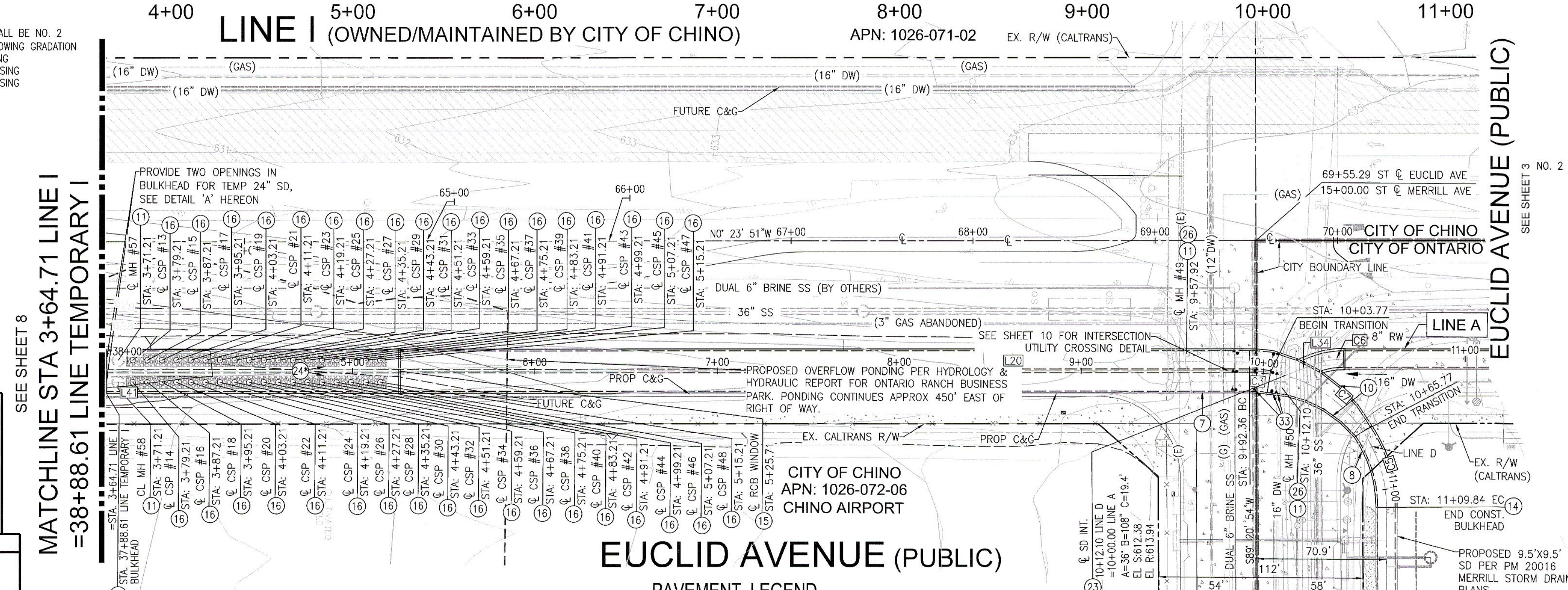
SEE PLAN VIEW SHEET 5

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

* PROPOSED RIP RAP SHALL BE NO. 2 BACKING ROCK WITH FOLLOWING GRADATION
75 LB – 0 TO 5% PASSING
25 LB – 25 TO 75% PASSING
5 LB – 90 TO 100% PASSING

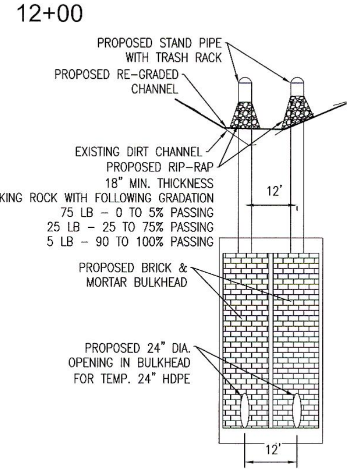
LINE I (OWNED/MAINTAINED BY CITY OF CHINO)

APN: 1026-071-02



EUCLID AVENUE (PUBLIC)

MERRILL AVENUE (PUBLIC)



DETAIL 'A'

SEE PLAN VIEW HEREON

CONSTRUCTION NOTES

(7) CONSTRUCT PRECAST DBL 10'x10' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 10'X10'– WITH SLOPED INVERT RCB PER CALTRANS STD. D81 & D82. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAILS ON SHEETS 13-18 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET 20

(8) CONSTRUCT PRECAST 9.5'x9.5' RCB PER CALTRANS STD D83A & D83B, ALTERNATIVE TO CONSTRUCT CAST-IN-PLACE 9.5'X9.5' INCLUDE V INVERT RCB PER CALTRANS STD. D80. BEDDING & BACKFILL PER CALTRANS STD. A62G, DETAILS ON SHEETS 14, 15, 17 AND 19 TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL SHEET 20

(10) CONSTRUCT TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB PER SPPWC STD. 343-2, DETAIL ON SHEET 12

(11) CONSTRUCT 36" STORM DRAIN MANHOLE SHAFT WITHOUT REDUCER PER SPPWC STD. 326-2, DETAIL ON SHEET 11

(14) CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11

(15) CONSTRUCT RCB WINDOW PER SPPWC STD 382-2, DETAIL ON SHEET 21

(16) CONSTRUCT RCB STAND PIPE OUTLET RISER PER DETAIL16 ON SHEET 11

(23) CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, DETAIL ON SHEET 13

(24) CONSTRUCT RIP-RAP PER SAN DIEGO REGIONAL STD. DWG. D-40 DETAIL ON SHEET 12

(26) CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 19

(33) INSTALL SURVEY MONITORING POINTS AND SETTLEMENT ROD PER CALTRANS TR-0151 AND TR-0152 ON SHEET 18

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
C3	008°43'08.0"	11.41'	75.00'	5.72
C5	033°39'48.2"	44.07'	75.00'	22.69
C6	020°49'26.7"	16.36'	45.00'	8.27
C7	047°22'56.9"	62.02'	75.00'	32.91
L20	N0°23'51"W	492.37'		
L34	N21°15'08"W	16.88'		

SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

SEAL

REGISTERED PROFESSIONAL ENGINEER No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

Lia A. Hall 4/12/22

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E. CITY ENGINEER FOR 7/28/22 DATE

PAVEMENT LEGEND

PROPOSED AC PAVEMENT PER SEP. PLAN
PROPOSED PCC PAVEMENT PER SEP. PLAN
EXISTING AC PAVEMENT TO REMAIN

LEGEND

STORM DRAIN FLOW DIRECTION

NOTE:
NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

CALTRANS # 08-22-6-UT-0007

PREPARED BY	REVISIONS	MADE BY	DATE	RECOMMENDED BY	DATE	BENCH MARK DATA	REFERENCE DRAWINGS	REVIEWED BY STAFF	BY	DATE	CITY ENGINEER'S STAFF	BY	DATE
FIRM: WESTLAND GROUP, INC.						BENCH MARK No. GG-18-1		WATER:			DRAWN:		
ADDRESS: 4150 CONCOURS, ONTARIO, CA 91764						ELEV. 635.314' (NAVD '88) LEVELED 2018		SEWER:			DESIGNED:		
TELEPHONE: (909) 989-9789 FAX: (909) 989-9660						LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.		FIRE:			CHECKED:		
SIGNATURE RCE 85559 DATE								PLANNING:			RECOMMENDED:		
								TRAFFIC:					
								ENVIRONMENTAL:					

RECOMMENDED BY: CITY ENGINEER DATE: 8/8/22

CITY OF CHINO ENGINEERING DIVISION

STORM DRAIN IMPROVEMENT PLAN & PROFILE

EUCLID AVENUE
FROM 590' SOUTH OF MERRILL AVE TO MERRILL AVE

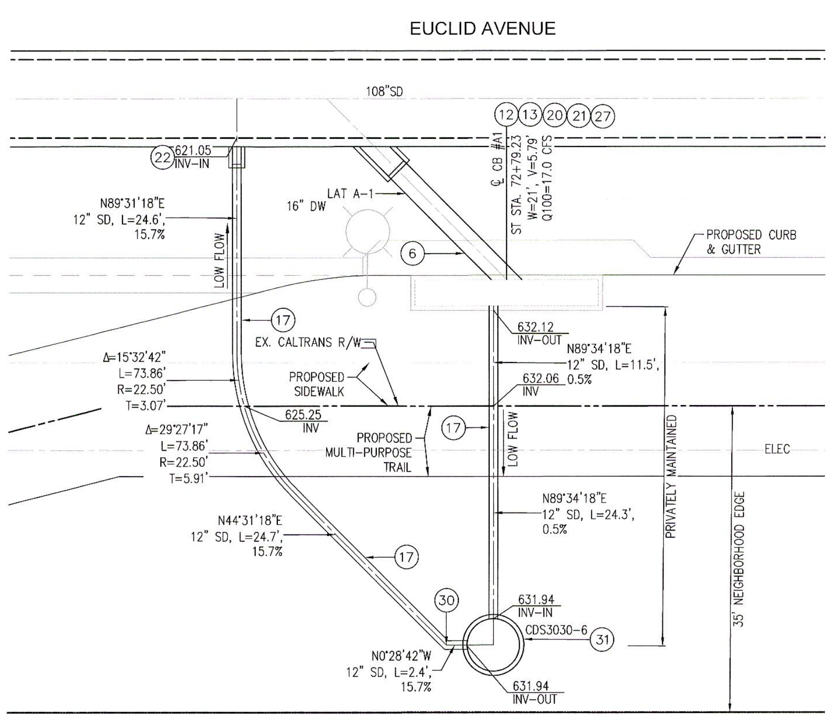
PROJECT NO. PM-20016

SHEET 9 OF 21

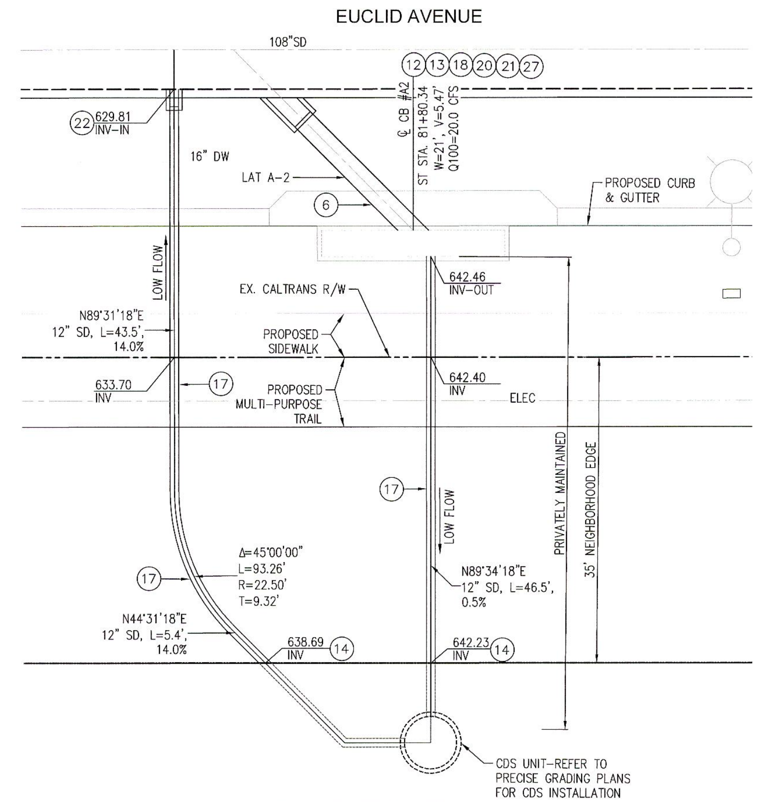
DRAWING NO. AA 5949 SD D1449

06/16/2022

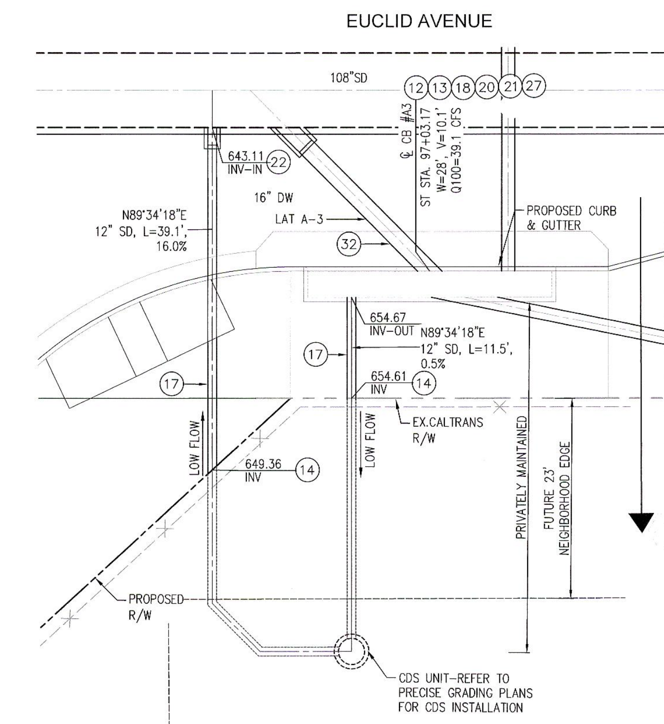
Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\06_09_2020-015_SD-PP.dwg
Last Opened: Jun 16, 2022 – 3:11pm by: Brent.King



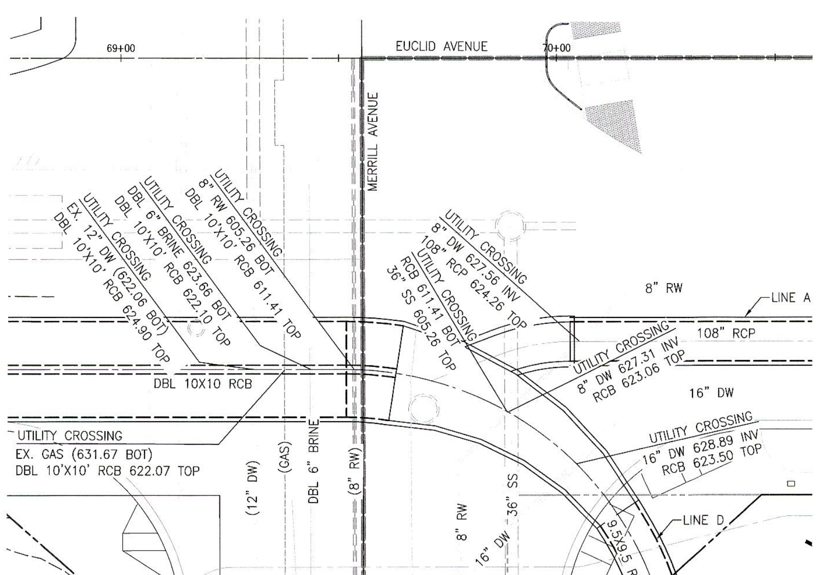
CDS DETAIL "A"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 3



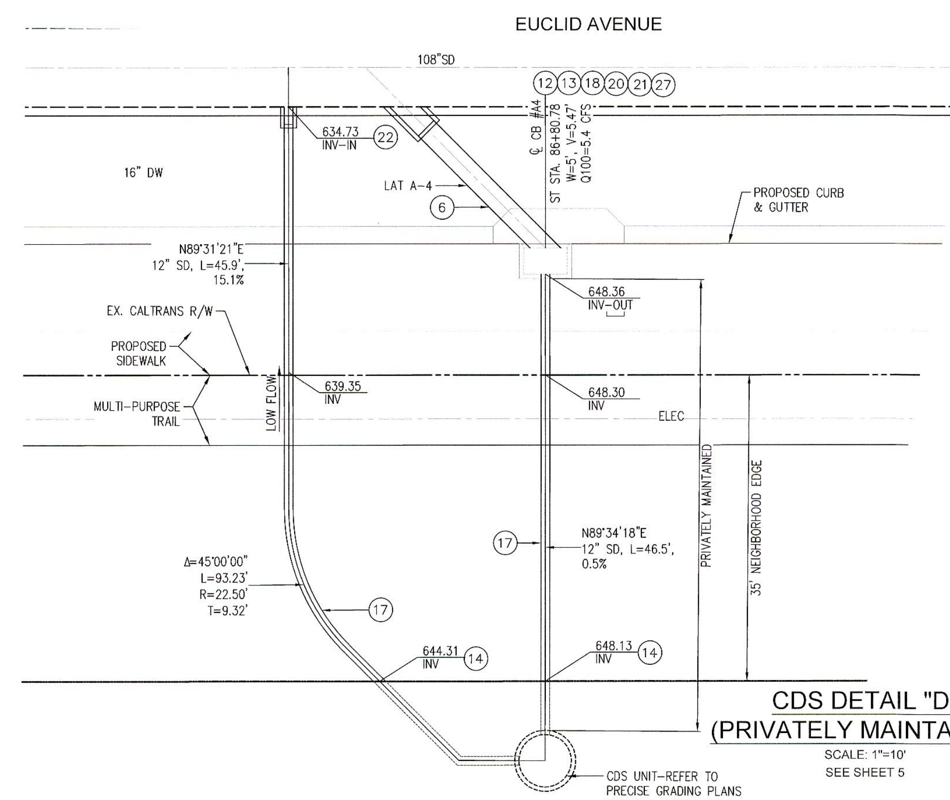
CDS DETAIL "B"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 4



CDS DETAIL "C"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 5



EUCLID AND MERRILL INTERSECTION
UTILITY CROSSING DETAIL
SCALE: 1"=20'
SEE SHEET 9



CDS DETAIL "D"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 5

CONSTRUCTION NOTES

- (6) CONSTRUCT 30" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
- (12) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
- (13) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20016 STREET IMPROVEMENT PLANS FOR DETAILS.
- (14) CONSTRUCT BRICK & MORTAR BULKHEAD PER DETAIL 14 ON SHEET 11
- (17) CONSTRUCT 12" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL ON SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20
- (18) INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 18 ON SHEET 11
- (20) CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
- (21) INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
- (22) CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 15
- (20) CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE, PER DETAIL 20 ON SHEET 11
- (27) CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2, DETAIL ON SHEET 12
- (30) CONSTRUCT 12" RCP CONCRETE COLLAR PER SPPWC STD. 380-4, DETAIL ON SHEET 21
- (31) CONSTRUCT CDS UNIT, SIZE PER PLAN PER DETAIL 31 ON SHEET 21
- (32) CONSTRUCT 24" RCP. BEDDING & BACKFILL PER CALTRANS STD. A62D, D-LOAD PER PLAN, DETAIL SHEET 16, TRENCHING PER DEP. OF TRANSPORTATION STD TR-0153, DETAIL ON SHEET 20

NOTE:

CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ONTARIO PROPERTY OWNERS PER WQMP MALIGNANCE. AGREEMENT.
WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT, AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.

811 Know what's below. Call 811 before you dig.

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

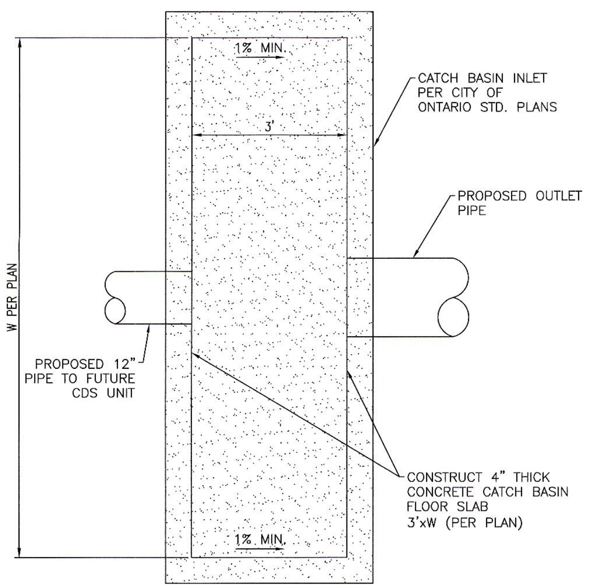
WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
CDS & UTILITY CROSSING DETAILS

PM-20016

SHEET 10 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD
D14494 06/16/2022

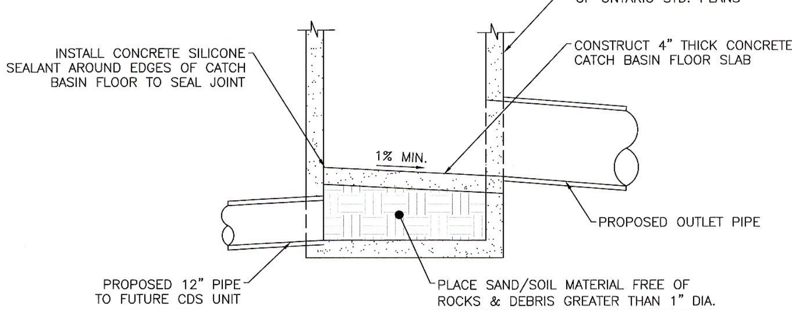
Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\10_2020-015_SD-CB DET.dwg
Last Opened: Jun 16, 2022 - 10:22am by: Brent.King



CATCH BASIN - PLAN VIEW

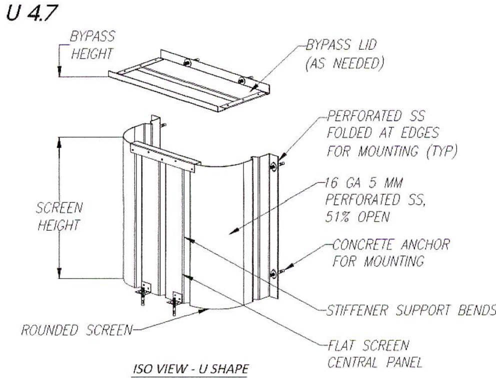
(18) CATCH BASIN - TEMPORARY FLOOR CONSTRUCTION DETAIL

N.T.S.



CATCH BASIN - PROFILE VIEW

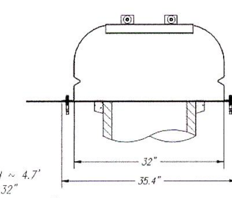
CONNECTOR PIPE SCREEN (CPS) U 4.7



ISO VIEW - U SHAPE

CPS U WITH 4.7 FT SCREEN LENGTH	
CPS HEIGHT (IN)	SCREEN FLOW (CFS)
12	6.67
18	12.26
24	18.88
30	26.40
36	34.71

NOTE: BYPASS FLOW RATES VARY WITH VAULT DEPTH AND BYPASS HEIGHT. CONTACT BIO CLEAN FOR ADDITIONAL INFORMATION.



TOTAL SCREEN LENGTH ~ 4.7'
SPAN LENGTH = 32"
COMPATIBLE WITH PIPES UP TO ø24"

TOP SECTION VIEW - U SHAPE

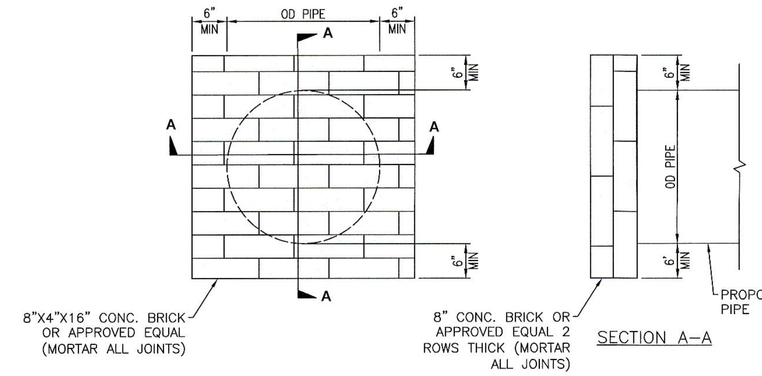
GENERAL NOTES

1. BIO CLEAN TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS, AND CAPACITIES ARE SUBJECT TO CHANGE.
3. THIS CPS UNIT IS DESIGNED FOR TREATMENT FLOWS THROUGH THE SCREEN. FLOWS GREATER THAN THE TREATMENT FLOW RATE WILL BYPASS OVER THE SCREEN.
4. A BYPASS LID IS REQUIRED WHEN THE OUTLET PIPE IS DIRECTLY BELOW THE CURB OPENING.
5. CPS IS COMPRISED OF 304 STAINLESS STEEL. THICKNESS IS 16 GAUGE. SCREEN PERFORATIONS ARE 5 MILLIMETERS IN DIAMETER. THE SCREEN AREA IS 51% OPEN SPACE.

INSTALLATION NOTES

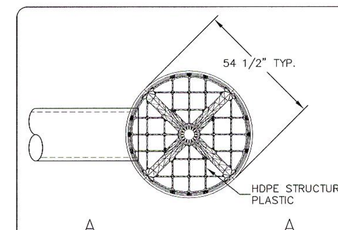
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS REQUIRED TO INSTALL THE CPS UNIT AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. POSITION THE CPS SO IT IS EVENLY SPACED AROUND THE CONNECTOR PIPE, ENSURING A MIN. OF 4" SPACING AWAY FROM ANY CORNERS. SCREEN BOTTOM SHALL BE FLUSH WITH THE CATCH BASIN FLOOR, OR WITH GAPS NO GREATER THAN 5 MM.
3. IF A BYPASS LID IS REQUIRED, VERIFY THE BYPASS HEIGHT NEEDED AND MARK THAT LOCATION ON THE WALL DIRECTLY ABOVE THE BASE UPRIGHTS. LIFT THE LID IN PLACE AND MARK THE HOLE LOCATIONS FOR THE LID MOUNTING BRACKETS. SECURE THE LID WITH STAINLESS STEEL NUTS.

WARRANTY: 3 YEAR MANUFACTURER'S		MEETS FULL CAPTURE REQUIREMENTS		Bio Clean A Forterra Company
BIO CLEAN ENVIRONMENTAL SERVICES, INC. 398 VIA EL CENTRO, OCEANSIDE CA 92058 PHONE: 760-433-7640		REVISIONS:	DATE:	
		REVISIONS:	DATE:	
DATE: 1/17/2020	SCALE: NTS	REVISIONS:	DATE:	
DRAFTER: G.M.S.	UNITS = INCHES	REVISIONS:	DATE:	



SECTION A–A

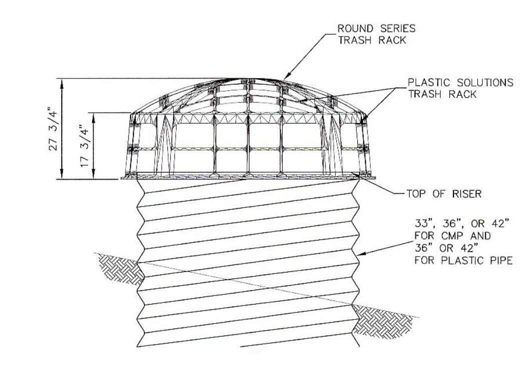
(14) BRICK AND MORTAR BULKHEAD DETAIL



TOP VIEW

NOTE: A 3/4" ROUND GALV PIPE MOUNTING KIT IS PROVIDED BY PLASTIC SOLUTIONS, INC.

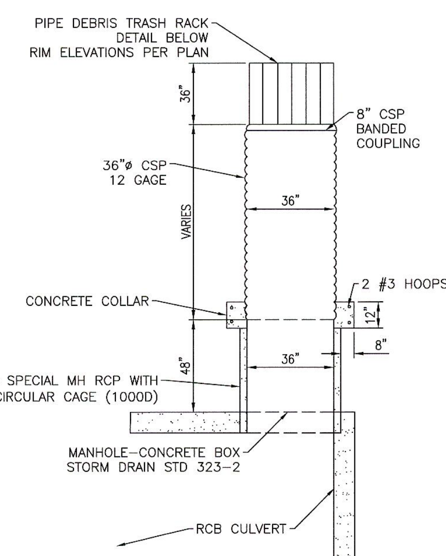
TRASH RACK ASSEMBLY



ELEV. A–A

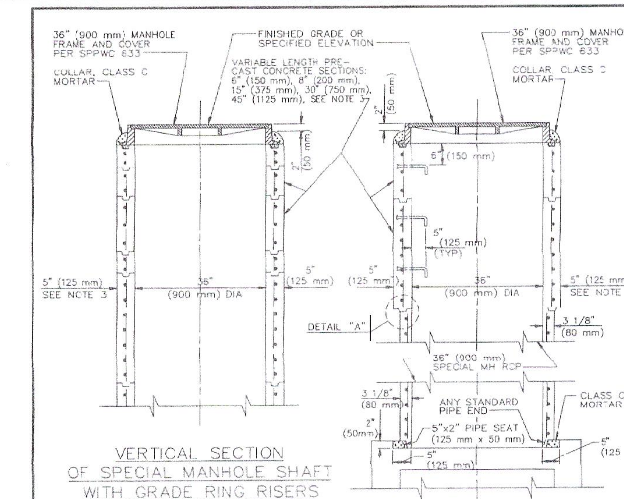
NOTE: **MOUNTING KIT INCLUDED**

PART NO	48" ROUND SERIES TRASH RACK	PLASTIC SOLUTIONS INC.	240 McGhee Road P.O. Box 4386 Winchester, VA 22604 540-722-4694 www.plastic-solution.com
RSP-48	WITH METAL OR PLASTIC RISER		



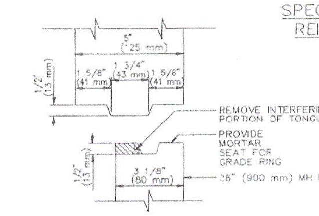
(16) RCB STAND PIPE OUTLET RISER

N.T.S.



VERTICAL SECTION OF SPECIAL MANHOLE SHAFT WITH GRADE RING RISERS

VERTICAL SECTION OF SPECIAL MANHOLE SHAFT WITH REINFORCED CONCRETE PIPE



DETAIL "A"

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009	MANHOLE SHAFT 36"(900 mm) WITHOUT REDUCER	STANDARD PLAN 326–2
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2

NOTES

1. UNLESS OTHERWISE INDICATED THIS STRUCTURE SHALL CONFORM TO ASTM C 478 (ASTM C 478M). ALL STEEL SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES AND ALL CONCRETE SHALL BE PER SSPWC.
2. WHERE A 36" (900 mm) MANHOLE IS CONSTRUCTED WITH 36" (900 mm) MANHOLE RCP, THE RCP SECTION SHALL CONTAIN A CIRCULAR CAGE AND HAVE A LOAD CARRYING CAPACITY OF AT LEAST 1000D (50D). SPECIAL MANHOLE SHAFT SHALL BE PER THIS STANDARD AND 36" (900 mm) MANHOLE FRAME AND COVER SHALL BE PER SPPWC 633.
3. THE MANHOLE SHAFT AND RINGS MAY BE PLAIN CONCRETE. FOR PLAIN CONCRETE SECTIONS THE MINIMUM THICKNESS SHALL BE 6" (150 mm).
4. ALL JOINTS SHALL BE SEALED BY FILLING THE ANNULAR SPACES WITH CLASS C MORTAR. THE INSIDE OF THE SHAFT AT EACH JOINT SHALL BE WIPED CLEAN OF EXCESS MORTAR.
5. PROTECTIVE PLASTIC LINER (T LOCK) OR ENGINEER–APPROVED COATINGS WHERE REQUIRED BY THE PLANS SHALL BE IN ACCORDANCE WITH SSPWC AND THE MANUFACTURER'S DIRECTIONS.
6. STEPS SHALL CONFORM TO SPPWC 635 OR 636. THE TOP STEP SHALL BE PLACED 6" (150 mm) BENEATH THE MANHOLE COVER FRAME. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC.
7. THE PRECAST CONCRETE MANHOLE STRUCTURES WILL BE INSPECTED BY THE ENGINEER WHO WILL INDICATE ACCEPTANCE FOR SHIPMENT TO THE JOB BY MARKING THE STRUCTURES WITH THE AGENCY'S STAMP.
8. THE VERTICAL SIDES OF THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE STORM DRAIN CONDUIT.
9. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330 IF DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
10. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

633 36" (900 mm) MANHOLE FRAME AND COVER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
MANHOLE SHAFT 36"(900 mm) WITHOUT REDUCER	326–2 SHEET 2 OF 2

811 Know what's below. Call 811 before you dig.

NOTE:

WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN KIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No. 85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

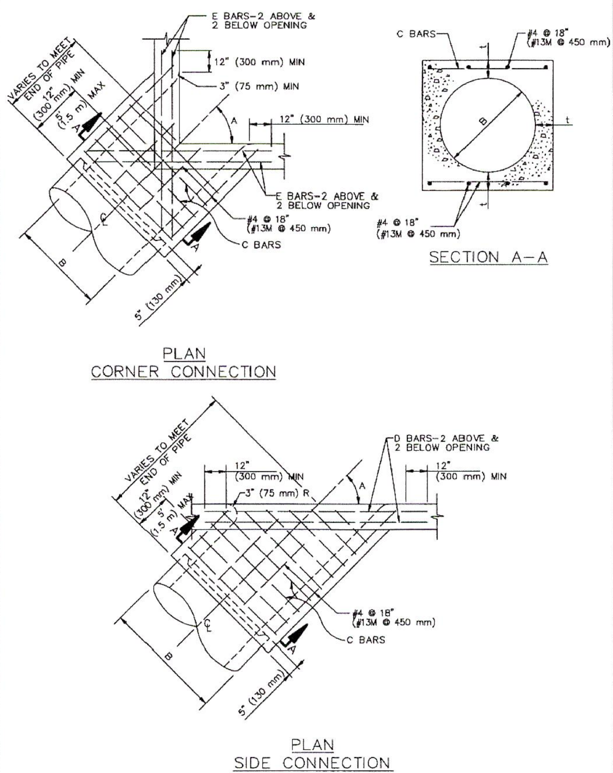
EUCLID AVENUE
DETAILS

PM-20016

SHEET 11 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 59495D

D14495 06/16/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 16, 2022 - 10:27am by: Brent.King

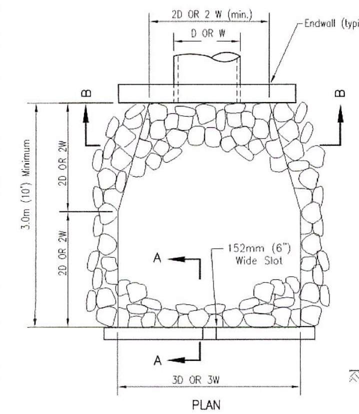


STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC., GREENBOOK COMMITTEE 1984 REV. 1996, 2009

MONOLITHIC CATCH BASIN CONNECTION — STANDARD PLAN 308–2 — SHEET 1 OF 2

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

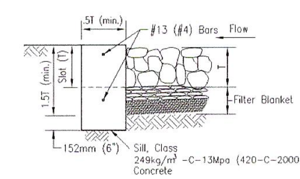


Design Velocity m/sec (ft/sec)*	Rock Classification	T (min)
1.8–3 (6–10)	No. 2 Backing	320mm (1.1ft)
3–3.7 (10–12)	220 kg (1/4 ton)	823mm (2.7ft)
3.7–4.3 (12–14)	450 kg (1/2 ton)	1.1m (3.5ft)
4.3–4.9 (14–16)	900 kg (1 ton)	1.3m (4.4ft)
4.9–5.5 (16–18)	1.8 tonne (2 ton)	1.6m (5.4ft)

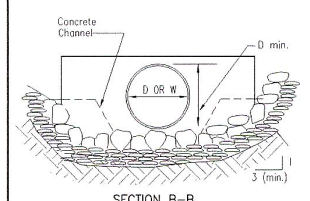
*over 5.5 mps (18 fps) requires special design

D = Pipe Diameter

W = Bottom Width of Channel



SECTION A–A



SECTION B–B

NOTES

1. Plans shall specify:
   A) Rock Class and thickness (T).
   B) Filter material, number of layers and thickness.
2. Rip rap shall be either quarry stone or broken concrete (if shown on the plans.) Cobbles are not acceptable.
3. Rip rap shall be placed over filter blanket which may be either granular material or filter fabric (woven filter slit film fabric shall not be used).
4. See Regional Supplement Amendments for selection of filter blanket.
5. Rip rap energy dissipators shall be designated as either Type 1 or Type 2. Type 1 shall be with concrete sill; Type 2 shall be without sill.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Add Rip Rap Table		S. Brady	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

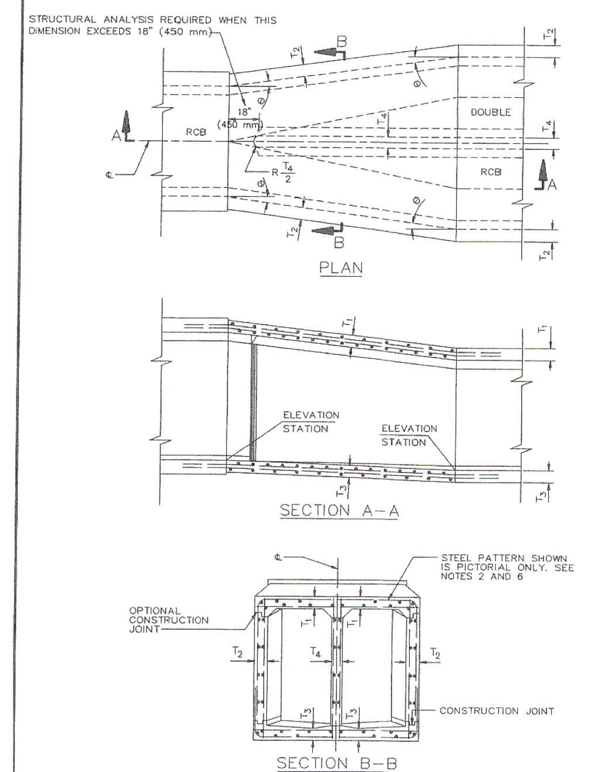
RIP RAP ENERGY DISSIPATOR

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

04/27/2006

Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-40



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 2009

TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB — STANDARD PLAN 343–2 — SHEET 1 OF 2

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

NOTES

1. THE HORIZONTAL ANGLE OF DIVERGENCE OR CONVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. REINFORCING STEEL BAR SIZE, SPACING AND OUTSIDE COVER SHALL BE THAT OF DOUBLE RCB SECTION. FOR CURVED TRANSITIONS, SPACE BARS ON CENTER LINE AND PLACE TRANSVERSE STEEL RADIALLY. THE BAR LENGTHS AND DIMENSIONS SHALL VARY UNIFORMLY THROUGHOUT TRANSITION. LONGITUDINAL BARS SHALL BE CONTINUED THROUGH THE JOINTS WITH THE TRANSITION STRUCTURE.
3. THE CONCRETE THICKNESS SHALL BE THAT OF THE DOUBLE RCB SECTION.
4. PLAN AS SHOWN IS FOR DOUBLE RCB SECTION DOWNSTREAM. WHEN DOUBLE RCB SECTION IS UPSTREAM TAPER THE LAST 24" (600 mm) OF CENTER WALL TO END IN 1 1/2" (40 mm) RADIUS.
5. f'_c = 4000 PSI (28 MPa) AT 28 DAYS AND THE CONCRETE SHALL BE THE SAME MIX AS THE ADJACENT RCB.
6. ALL STEEL, EXCEPT LONGITUDINAL STEEL SHALL BE GRADE 60 (400) BILLET STEEL CONFORMING TO ASTM A 615 (A 615 M) AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. TRANSVERSE JOINT KEYWAYS, AS DETAILED FOR LONGITUDINAL JOINT KEYWAYS AT BASE OF OUTER WALLS ON THE PLANS, SHALL BE PLACED IN BOTH SLABS AND WALLS AT THE END OF EACH POUR.
8. THE TRANSITION STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STRUCTURAL NOTES APPLYING TO RCB STRUCTURES SHOWN ON THE PLANS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB — STANDARD PLAN 343–2 — SHEET 2 OF 2

STRUCTURAL DATA

B	t	C BARS	D&E BARS	B	t	C BARS	D&E BARS
12" (300 mm)	4" (115 mm)	#4 @ 6" (#13M @ 150 mm)	#5 (#16M)	42" (1050 mm)	7 1/2" (190 mm)	#5 @ 6" (#16M @ 150 mm)	#6 (#19M)
15" (375 mm)	4-1/4" (115 mm)			45" (1125 mm)	7 3/4" (190 mm)		
18" (450 mm)	4-1/2" (115 mm)			48" (1200 mm)	8" (215 mm)		
21" (525 mm)	5" (140 mm)			51" (1275 mm)	8 1/2" (215 mm)		
24" (600 mm)	5 1/4" (140 mm)			54" (1350 mm)	9" (240 mm)		
27" (675 mm)	5 1/2" (140 mm)			57" (1425 mm)	9 1/4" (240 mm)		
30" (750 mm)	6" (165 mm)			60" (1500 mm)	9 1/2" (240 mm)		
33" (825 mm)	6 1/4" (165 mm)			63" (1575 mm)	10" (260 mm)		
36" (900 mm)	6 1/2" (165 mm)			66" (1650 mm)	10 1/4" (260 mm)		
39" (975 mm)	7" (190 mm)			69" (1725 mm)	10 3/4" (280 mm)		
				72" (1800 mm)	11" (280 mm)		

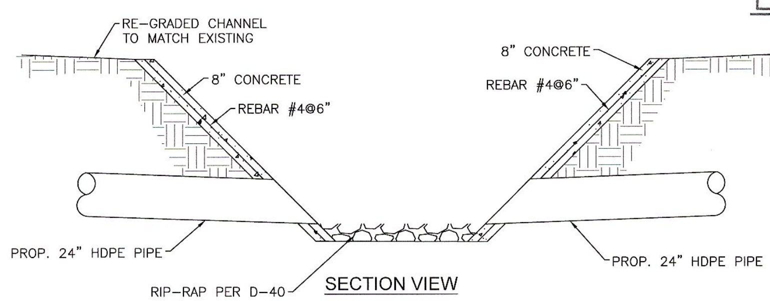
FOR B GREATER THAN 72" (1800 mm) SEE PLANS

NOTES

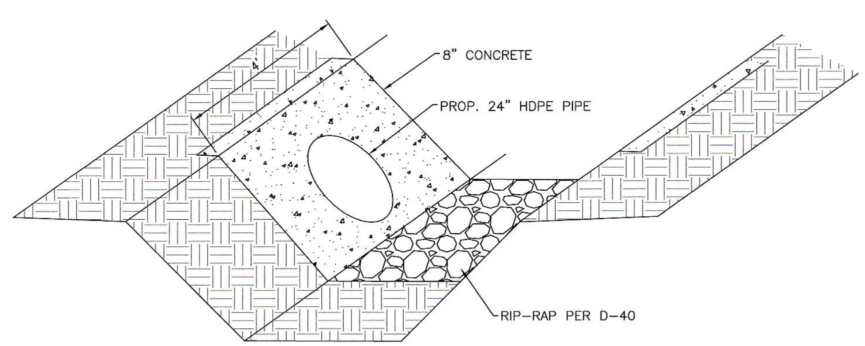
1. REINFORCING STEEL SHALL BE 1-1/2" (40 mm) CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CATCH BASIN CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN SHALL BE CUT 2" (50 mm) CLEAR OF OPENING.
3. CONNECTION SHALL BE PLACED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY PLACING CONCRETE WITH THE SAME CLASS OF CONCRETE AS THE CATCH BASIN AGAINST A CURVED FORM WITH A RADIUS OF 3" (75 mm).
4. CONNECTIONS SHALL BE CONSTRUCTED WHEN:
   (A) PIPES INLET OR OUTLET THROUGH CORNER OF CATCH BASIN
   (B) ANGLE A FOR PIPES THROUGH 30" (750 mm) IN DIAMETER IS LESS THAN 70° OR GREATER THAN 110°.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MONOLITHIC CATCH BASIN CONNECTION — STANDARD PLAN 308–2 — SHEET 2 OF 2



SECTION VIEW



ISOMETRIC VIEW

25 CHANNEL CONCRETE END WALL DETAIL

N.T.S.

Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: ____ 8/8/22

CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022

DRAWN BY: PK/BK DATE: 04/26/2022

CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — FCA 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 6/22/22 DATE

CALTRANS # 08-22-6-UT-0007

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 12 OF 21
CONTRACT ____
ACCOUNT ____
DWG. NO. AA 5949 SD

D14496 06/08/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 08, 2022 - 4:15pm by: Brent.King

DESIGN NOTES:

Design Specifications:
AASHTO LRFD Bridge Design Specifications, 6th Edition with California Amendments.

Loading:
Live load: (AASHTO LRFD 3.6.1.2)
HL-93 consists of design truck or design tandem and design lane load.

Impact Factor: (Apply to roof slab only)
$IM = 33(1.0-0.125D_E) \geqslant 0\%$ (AASHTO LRFD 3.6.2.2)
D_E = minimum depth of earth cover

Earth load:
Earth pressure for two conditions:
140 pcf vertical, 42 pcf horizontal
140 pcf vertical, 140 pcf horizontal

Load Factors:
AASHTO LRFD Table 3.4.1.1 & Table 3.4.1.2

Unit stresses:
f'_c = 3600 psi
f_y = 60,000 psi

Distribution "d" bars:
Up to and including 10'-0" cover
Express as a percentage of main positive reinforcement required: $\frac{100}{\sqrt{S}}$, Max 50%,
Over 10'-0" cover,
4 @ 12 maximum

Shear:
$V_c = \{2.14\sqrt{f'_c}+4600 \frac{A_s}{bd_e}\frac{V_u d_e}{M_u}\} b.d_e \leqslant 4.0\sqrt{f'_c}\, b.d_e$ (Pounds)
V_c shall not be less than $3.00\sqrt{f'_c}\, b.d_e$ for frame members and $2.5\sqrt{f'_c}\, b.d_e$ for simply supported members.

Exclusion:
Compressive reinforcement and negative moment reduction (for continuity) do not apply.
Axial loading on members has not been considered.

CONSTRUCTION NOTES:

Construction loads:
Strutting required as shown on Standard Plan D88. Strutting may be required on culvert extensions when existing parapet is removed.

Expansion joints:
Invert:
No expansion joints shall be permitted.

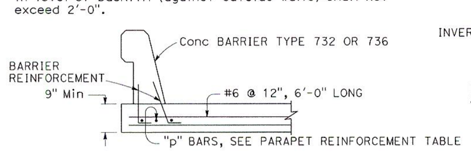
Roof and Walls:
When cover is less than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers outside the paved roadway lanes and place Bridge Detail 3-2, Standard Plan B0-3, at 30'-0" centers under paved roadway lanes.
When cover is more than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers and additional ½" premolded expansion joints at locations of change in foundation character, as directed by the Engineer.

Construction joints:
Temporary joints may be permitted if normal (or radial) to ℄ of RCB. Otherwise, the contractor is to submit a proposal for consideration.

Cutoff walls:
4'-0" cutoff walls are to be provided at inlet and/or outlet unless adjacent channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant.

Earthwork:
See Standard Plan A62E.

Backfill:
See Standard Specifications, except that the difference in level of backfill (against outside walls) shall not exceed 2'-0".



BARRIER SECTION (30'-0" MINIMUM)

GENERAL NOTES:

Designation:
Standard single or multiple box culverts are shown on plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10' or double 10' x 5' RCB with 20', followed by alternatives.

Alternatives:
Single cell: Invert will be sloped unless "trapezoidal invert", "flat invert" or "V invert" is included in designation.
Multiple cell: Invert will be vee unless "flat invert" is specified. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown unless designated in plans. Such designations may be different for inlet and outlet ends.

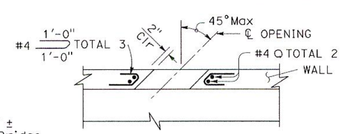
Quantities:
Quantities do not include the following:
- Concrete for parapet, paving notches and cut-off wall.
- Reinforcement for 2% splices, parapets, paving notches, cut-off wall and additional required bars for exposed top slab (D-80, Note 9).

Reinforcement placement:
Main reinforcement is to be placed transversely or, for curved culverts, radially. When radial, reinforcing spacing of the "a", "f" and "g" bars is measured along the centerline. Stagger splices not shown. Hooks may be rotated or tilted, as necessary, for clearance.

Special reinforcement coverage:
Box standard plans are not to be used for culverts in a corrosive environment or where there is a severe abrasive flow condition or in freeze-thaw locations.

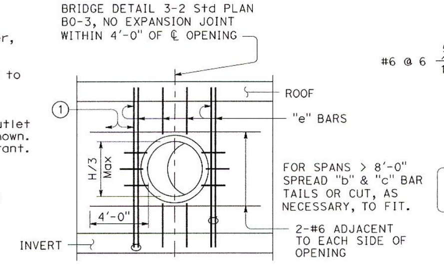
Special design:
Required for culverts with conditions, loads, design bearing pressures or sizes greater than those given on this plan or Standard Plans D80 & D81. Also required for multiple cell culverts with unequal spans. For culverts with railroad loading, see the current AREMA design specification.

3 or more cells:
For culverts with more than two cells, use dimensions and reinforcement for the standard "double box culvert" and adjust quantities accordingly.



PART PLAN-SECTION

BRIDGE DETAIL 3-2 Std PLAN B0-3, NO EXPANSION JOINT WITHIN 4'-0" OF ℄ OPENING

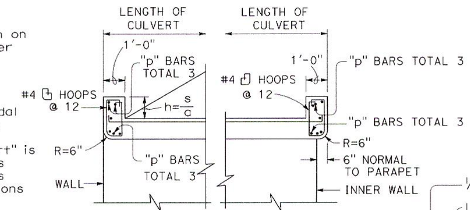


LONGITUDINAL SECTION

UTILITY OPENING-WALL

H=Height of box

① Adjacent to each side of the opening, place additional bars equivalent to half the interrupted main reinforcement.



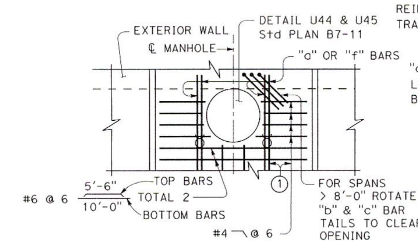
SINGLE SPAN MULTIPLE SPAN

PARAPET DETAIL

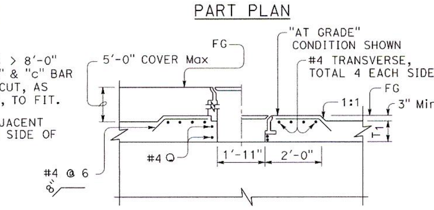
s = Clear span (ft)
a = 12 cosine skew angle
h = Height, 1'-0" Min

PARAPET "p" BARS			
SKEW ANGLE / SPAN	0° TO 15°	16° TO 30°	31° TO 45°
4'	#4	#4	#4
6'	#4	#4	#5
8'	#4	#5	#6
10'	#5	#6	#7
12'	#6	#7	#8
14'	#7	#8	#9

PARAPET REINFORCEMENT

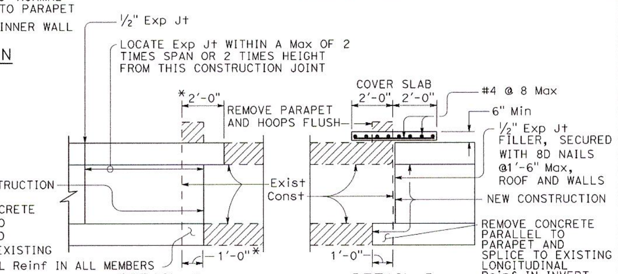


PART PLAN



PART LONGITUDINAL SECTION

MANHOLE



DETAIL A

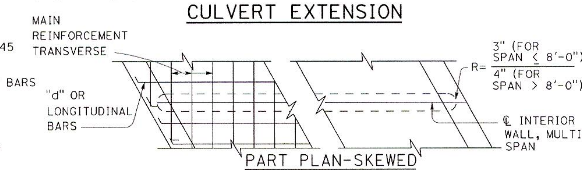
20° maximum skew as shown. If existing longitudinal and transverse reinforcing bars in top slab are lap spliced with new longitudinal and transverse reinforcing bars, the 20° skew may be exceeded. Lap splicing may require removal of top slab in excess of 2'-0" shown.

DETAIL B

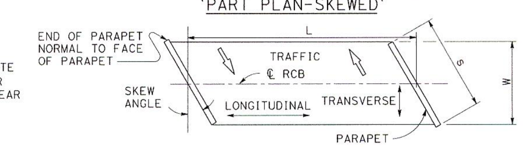
Single cell only, no skew allowed, 1'-0" minimum cover.

* Measured perpendicular to parapet

CULVERT EXTENSION



PART PLAN-SKEWED



RCB TERMINOLOGY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS

NO SCALE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

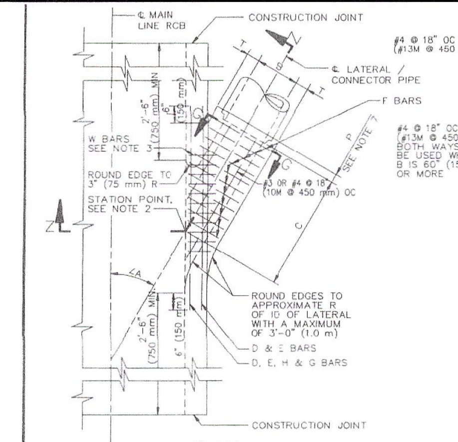
REGISTERED CIVIL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER Carl W. Bush C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

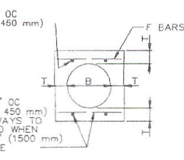
2018 STANDARD PLAN D82

D82

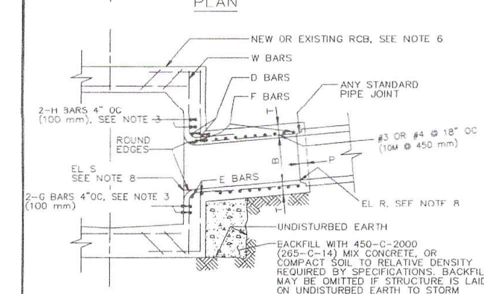
1-29-18



PLAN



SECTION G–G



SECTION Z–Z

B	T	D,E,H & G BARS	F BARS
12" (300 mm)	5" (130 mm)	#5 (#16M)	#4 @ 6" (#13M @ 150 mm) OC
15" (375 mm)	5" (130 mm)		
18" (450 mm)	5" (130 mm)		
21" (525 mm)	5" (130 mm)		
24" (600 mm)	5 1/4" (140 mm)		
27" (675 mm)	5 1/2" (140 mm)		
30" (750 mm)	6" (160 mm)		
33" (825 mm)	6 1/4" (160 mm)		
36" (975 mm)	6 1/2" (170 mm)		
39" (990 mm)	7" (180 mm)		
42" (1050 mm)	7 1/2" (190 mm)	#6 (#19M)	#5 @ 6" (#16M @ 150 mm) OC
45" (1125 mm)	7 3/4" (200 mm)		
48" (1220 mm)	8" (210 mm)		
51" (1275 mm)	8 1/2" (220 mm)		
54" (1350 mm)	9" (230 mm)		
57" (1500 mm)	9 1/4" (240 mm)		
60" (1500 mm)	9 1/2" (240 mm)		
63" (1650 mm)	10" (260 mm)		
66" (1680 mm)	10 1/4" (260 mm)		
69" (1800 mm)	10 3/4" (280 mm)		
72" (1850 mm)	11 (280 mm)		
78" (1950 mm)	11 3/4" (300 mm)		
84" (2100 mm)	12 1/2" (320 mm)		
90" (2400 mm)	13 1/4" (340 mm)	#7 (#22M)	#5 @ 6" (#16M @ 150 mm) OC
96" (2440 mm)	14" (360 mm)		
102" (2550 mm)	15 1/2" (400 mm)		
108" (2700 mm)	16" (410 mm)		
114" (3000 mm)	16 1/2" (420 mm)		
120" (3050 mm)	17" (430 mm)		
126" (3150 mm)	17" (430 mm)		
132" (3300 mm)	17 1/2" (450 mm)		
138" (3450 mm)	17 1/2" (450 mm)		
144" (3600 mm)	18" (460 mm)		

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009
JUNCTION STRUCTURE – PIPE TO RCB
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STANDARD PLAN 333–2
SHEET 1 OF 2

NOTES

1. VALUES FOR A, B AND C SHALL BE SHOWN ON THE PLANS. *ELEVATION R AND ELEVATION S SHALL BE SHOWN WHEN REQUIRED PER* NOTE 8.
2. STATIONS SPECIFIED ON THE PLANS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERALS, EXCEPT THAT STATIONS FOR CATCH BASIN CONNECTOR PIPES APPLY AT NSIDE WALL OF STRUCTURE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
   a. W BARS ARE OF SIZE AND SPACING SPECIFIED FOR WALL STEEL ON PLANS, AND SHALL BE CUT IN CENTER OF OPENING AND BENT INTO TOP AND BOTTOM OF JUNCTION STRUCTURE.
   b. OMIT H BARS WHEN SOFFIT OF SPUR IS 12" (300 mm) OR LESS BELOW *SOFFIT OF MAIN LINE, AND OMIT G BARS WHEN INVERT OF SPUR IS* 12" (300 mm) OR LESS ABOVE FLOOR OF MAIN LINE.
4. JUNCTION STRUCTURE SHALL BE POURED MONOLITHICALLY WITH MAIN LINE, MANHOLE OR TRANSITION STRUCTURE.
5. FLOOR OF STRUCTURE SHALL BE STEEL–TROWELED TO THE SPRING LINE.
6. WHEN CONNECTING TO EXISTING RCB, BREAKOUT LIMITS AND DETAILS SHALL BE SHOWN ON THE PLANS.
7. EMBEDMENT, P, SHALL BE 5" (130 mm) FOR B = 96" (2400 mm) OR LESS 8" (200 mm) FOR B OVER 96" (2400 mm).
8. IF ELEVATION R AND ELEVATION S ARE NOT SHOWN ON THE PLANS *THEN THE INLET OPENING SHALL FALL 6" (150 mm) BELOW* THE SOFFIT OF THE MAIN LINE WITH THE INLET PIPE LAID ON A STRAIGHT GRADE FROM MAIN LINE TO CATCH BASIN OR TO GRADE BREAK IN INLET LINE. ELEVATION S SHALL BE SHOWN ON THE PLANS IF THE INLET OPENING FALLS MORE THAN 6" (150 mm) BELOW THE SOFFIT OF THE MAIN LINE WITH THE INLET PIPE LAID ON A STRAIGHT GRADE AS STATED ABOVE.
   ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN A STUB IS TO BE PROVIDED FOR A FUTURE CONNECTION.
9. LATERALS OR CONNECTOR PIPES 24" (600 mm) OR LESS IN DIAMETER SHALL BE NO MORE THAN 5' (1.5 m) ABOVE THE INVERT. LATERALS OR CONNECTOR PIPES 27" (675 mm) OR LARGER IN DIAMETER SHALL BE NO MORE THAN 18" (450 mm) ABOVE THE INVERT, WITH THE EXCEPTION THAT CATCH BASIN CONNECTOR PIPES LESS THAN 50' (15 m) IN LENGTH SHALL *NOT BE MORE THAN 5' (1.5 m) ABOVE THE INVERT.*
10. THE NEED FOR AN EDGE BEAM AND/OR ADDITIONAL REINFORCEMENT SHALL BE NVESTIGATED BY THE ENGINEER FOR ANY ONE OF THE FOLLOWING CONDITIONS:
    a. ANGLE A IS LESS THAN 30°
    b. TOP OF INLET PIPE IS LESS THAN 6" (150 mm) BELOW THE SOFFIT
    c. FLOW LINE OF INLET PIPE IS LESS THAN 7" (180 mm) ABOVE THE THE FLOOR OF THE RCB AT THE INSIDE FACE

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
JUNCTION STRUCTURE – PIPE TO RCB
STANDARD PLAN 333–2
SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

Know what's **below.** **Call 811 before you dig.**

CITY OF CHINO
RECOMMENDED BY: ____ 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK
DATE: 04/26/2022
DRAWN BY: PK/BK
DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: ~~KHOI DO~~, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

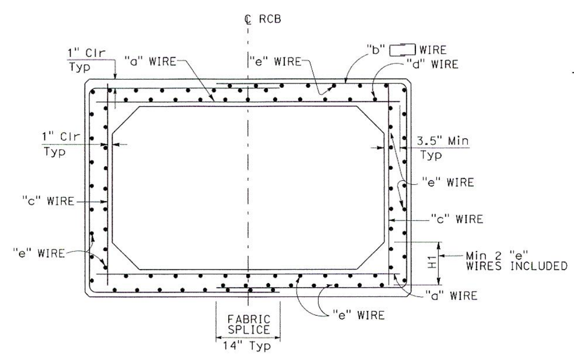
STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

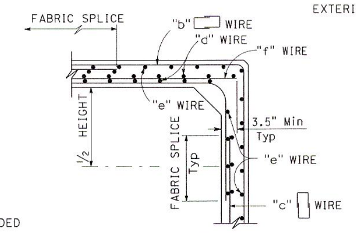
SHEET 13 OF 21
CONTRACT ____
ACCOUNT ____
DWG. NO. AA 5949 SD

D14497 06/03/2022

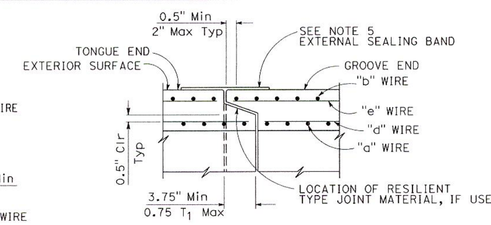
224



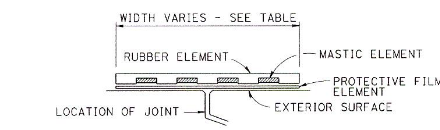
TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"



ALTERNATIVE DETAILING OPTION



END JOINT DETAIL



EXTERNAL SEALING BAND SCHEMATIC

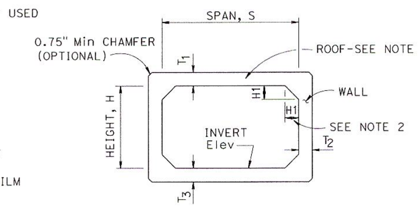
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER Carl W. Dunn No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA



SCHEMATIC

TABLE	
SPAN	EXTERNAL SEALING BAND WIDTH
4'-6'	9"
7'-8'	11"
10'-12'	13"

SPAN, S			4'						5'								6'								7'									
HEIGHT, H			2'		3'		4'		2'		3'		4'		5'		3'		4'		5'		6'		3'		4'		5'		6'		7'	
MAXIMUM EARTH COVER			10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH)	ROOF	T_1	5.5"	5.5"	5.5"	5.5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	6"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
	SIDE WALL	T_2	5.5"	5.5"	5.5"	5.5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	6"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
	INVERT	T_3	5.5"	5.5"	5.5"	5.5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	6"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
MINIMUM WELDED WIRE FABRIC (inch^2/ft)		"a"	.33	.47	.34	.49	.34	.50	.40	.62	.41	.62	.42	.64	.43	.64	.44	.67	.45	.70	.46	.71	.47	.72	.47	.72	.48	.75	.50	.78	.50	.79	.51	.80
		"b"	.23	.28	.23	.25	.21	.23	.26	.36	.24	.36	.24	.33	.24	.30	.28	.44	.27	.40	.27	.37	.27	.38	.33	.52	.31	.48	.30	.45	.30	.43	.30	.48
		"c"	.11	.11	.11	.12	.18	.24	.11	.11	.11	.11	.13	.23	.24	.34	.11	.11	.11	.12	.19	.27	.27	.42	.11	.11	.11	.11	.13	.20	.26	.31	.30	.50
		"d"	.16	.11	.16	.11	.16	.11	.17	.11	.18	.11	.18	.11	.18	.11	.17	.11	.18	.11	.18	.11	.18	.11	.17	.11	.17	.11	.18	.11	.18	.11	.18	.11
		"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
		"f"	.22	.36	.23	.37	.22	.26	.29	.51	.30	.51	.29	.41	.26	.30	.33	.56	.34	.58	.27	.44	.21	.30	.36	.61	.37	.64	.37	.57	.25	.48	.21	.30
* QUANTITY	Conc	CY/LF	.31		.34		.38		.37		.41		.44		.48		.51		.56		.60		.64		.63		.68		.73		.78		.83	
	Reinf	LB/LF	35	41	39	45	45	51	49	58	49	62	54	69	62	78	60	79	64	83	72	93	80	107	72	98	76	102	81	110	92	120	101	143
** SOIL PRESSURE (ksf)			2.3	4.4	2.4	4.5	2.4	4.5	3.1	4.4	3.1	4.5	3.1	4.5	3.2	4.5	2.7	4.5	2.8	4.5	2.8	4.6	2.8	4.6	2.5	4.5	2.5	4.6	2.5	4.6	2.5	4.6	2.6	4.6

SPAN, S			8'										10'												12'													
HEIGHT, H			4'		5'		6'		7'		8'		5'		6'		7'		8'		9'		10'		6'		7'		8'		9'		10'		11'		12'	
MAXIMUM EARTH COVER			10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
CONCRETE (INCH)	ROOF	T_1	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
	SIDE WALL	T_2	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
	INVERT	T_3	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	8.5"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	10"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
MINIMUM WELDED WIRE FABRIC (inch^2/ft)		"a"	.55	.87	.56	.90	.57	.92	.58	.93	.58	.94	.66	1.07	.67	1.10	.69	1.13	.70	1.14	.70	1.16	.71	1.16	.73	1.21	1.21	1.24	.77	1.27	1.24	1.29	1.27	1.31	.78	1.32	1.29	1.32
		"b"	.37	.59	.35	.55	.33	.52	.33	.52	.36	.57	.45	.74	.43	.70	.41	.67	.40	.64	.43	.67	.48	.67	.51	.85	.85	.81	.49	.77	.81	.74	.77	.77	.53	.79	.74	.79
		"c"	.11	.11	.11	.11	.20	.31	.31	.42	.38	.62	.11	.11	.11	.11	.22	.31	.36	.42	.40	.62	.54	.86	.11	.11	.11	.11	.23	.30	.37	.42	.42	.60	.54	.82	.42	1.06
		"d"	.19	.11	.19	.11	.20	.11	.20	.11	.20	.11	.20	.11	.20	.11	.21	.11	.21	.11	.21	.11	.21	.11	.20	.11	.20	.11	.21	.11	.22	.11	.22	.11	.22	.11	.22	.11
		"e"	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11
		"f"	.44	.76	.45	.79	.37	.61	.27	.52	.20	.31	.55	.96	.56	.99	.47	.81	.34	.73	.31	.53	.16	.30	.62	1.10	1.10	1.13	.64	.97	1.13	.87	.97	.71	.40	.50	.87	.26
* QUANTITY	Conc	CY/LF	.78		.83		.88		.94		.99		1.10		1.17		1.23		1.29		1.35		1.41		1.56		1.63		1.70		1.78		1.85		1.93		2.00	
	Reinf	LB/LF	93	129	97	133	105	148	117	161	131	189	133	191	138	196	148	212	191	225	176	253	201	282	174	255	179	261	191	279	207	293	223	323	249	357	281	393
** SOIL PRESSURE (ksf)			2.5	4.6	2.5	4.6	2.5	4.6	2.5	4.6	2.5	4.6	3.8	4.6	3.8	4.7	3.8	4.7	4.6	4.7	3.9	4.7	3.9	4.8	3.6	4.7	3.7	4.7	3.7	4.8	3.7	4.8	3.7	4.8	3.8	4.9	3.8	4.9

* See Note 3 ** See Note 6

NOTES:

1. The inside and outside surfaces of the RCB roof shall be marked "TOP".
2. H1 minimum shall equal the wall thickness. H1 maximum shall be 8" for spans through 8' and 14" for spans over 8'.
3. Quantities are approximate and for design purposes only.
4. For design and details not shown see Standard Plan D83B.
5. For external sealing band applications see Standard Plan A62G.
6. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

2018 STANDARD PLAN D83A

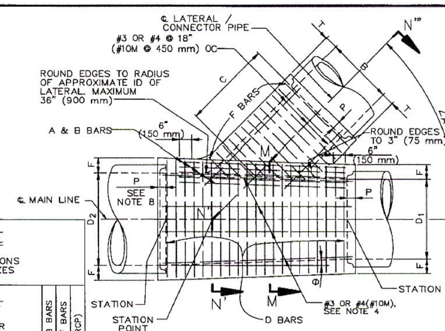
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PRECAST REINFORCED CONCRETE BOX CULVERT

NO SCALE

D83A

1-29-18

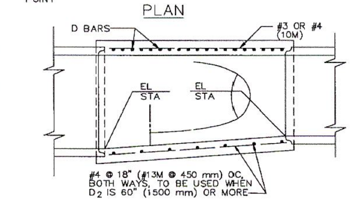


PLAN

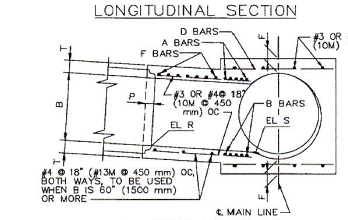
TABLE

FOR DIMENSIONS AND BAR SIZES

D_2 OR B (INCHES)	D_2 OR B (mm)	F OR T (INCHES)	F OR T (mm)	A OR B BARS	D OR F BARS	P (RCP)
12	300	4	110	#5@3" (#16M @ 75 mm) OC	#4@6" (#13M @ 150 mm) OC	5" (125 mm)
15	375	4 1/4	110			
18	450	4 1/2	120			
21	525	5	130			
24	600	5 1/4	140			
27	675	5 1/2	140			
30	750	6	160			
33	825	6 1/4	160			
36	900	6 1/2	170			
39	975	7	180			
42	1050	7 1/2	190	#6 @ 3" (#19M @ 75 mm) OC	#5 @ 6" (#16M @ 150 mm) OC	
45	1125	7 3/4	200			
48	1200	8	210			
51	1275	8 1/2	220			
54	1350	9	230			
57	1425	9 1/4	240			
60	1500	9 1/2	250			
63	1575	10	260			
66	1650	10 1/4	260			
69	1725	10 3/4	280			
72	1800	11	280			
78	1950	11 3/4	300			
84	2100	12 1/2	320			
90	2250	13 1/4	340	#7@3" (22M @ 75 mm) OC	#6@6" (19M @ 150 mm) OC	
96	2400	14	360			
102	2550	15 1/2	400			8" (200 mm)
108	2700	16	410			
114	2850	16 1/2	420			
120	3000	17	440			
126	3150	17	440			
132	3300	17 1/2	450			
138	3450	17 1/2	450			
144	3600	18	460			



LONGITUDINAL SECTION



SECTION N'-N"-N"'
PROJECTED ON M-M-N"'

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 2009

TRANSITION STRUCTURE PIPE TO PIPE

STANDARD PLAN 340-2 SHEET 1 OF 2

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

NOTES

1. THE HORIZONTAL ANGLE OF CONVERGENCE OR DIVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. VALUES FOR A, B, C, D_1 AND D_2 ARE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S ARE SHOWN WHEN REQUIRED BY NOTE 10.
3. FLOOR OF STRUCTURE SHALL BE STEEL TROWELED TO SPRING LINE.
4. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A 615 (A 615 M), GRADE 300 (40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. LONGITUDINAL BARS SHALL BE #3 OR #4 @ 18" (#10M @ 450 mm) OC OR LESS.
5. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
6. TRANSITION STRUCTURE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT LONGITUDINAL KEYWAY.
7. THE LENGTH OF THE STRUCTURE MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET RCP ENDS, USING D BARS, LONGITUDINAL AND BOTTOM REINFORCEMENT IN EXTENDED PORTION OF SAME DIAMETER AND SPACING AS SPECIFIED IN THE TABLE, BUT ANY CHANGE IN THE LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.
8. EMBEDMENT P SHALL BE AS SPECIFIED IN THE TABLE, UNLESS OTHERWISE SHOWN ON THE PLANS.
9. WHEN THERE IS NO SPUR REQUIRED, A & B BARS SHALL BE OMITTED.
10. WHEN ELEVATION R AND ELEVATION S ARE NOT SHOWN ON PLANS, INLET PIPE SHALL ENTER MAIN LINE RADIALLY. WHEN INLET PIPE ENTERS MAIN LINE OTHER THAN RADIALLY, ELEVATION S SHALL BE SHOWN ON PLANS, AND INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO CATCH BASIN OR GRADE BREAK IN INLET LINE. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN STUB IS TO BE PROVIDED IN MAIN LINE FOR FUTURE CONSTRUCTION OF INLET PIPE.
11. THE MAXIMUM COVER ABOVE THIS STRUCTURE SHALL BE 25' (7.5 m). IF THE COVER EXCEEDS 25' (7.5 m) A SPECIAL STRUCTURE SHALL BE DESIGNED FOR THE COVER AND DETAILED ON THE PLANS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

TRANSITION STRUCTURE PIPE TO PIPE

STANDARD PLAN 340-2 SHEET 2 OF 2

811 Know what's below. Call 811 before you dig.

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 14 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14498 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:00pm by: Brent.King

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Carl M. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

DESIGN NOTES:

Specifications:

AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.

Earth load:

Earth pressures for two conditions:
140 pcf Vert, 42 pcf Horiz
140 pcf Vert, 140 pcf Horiz

Unit stresses:

f'c = 5.0 ksi
fy = 65.0 ksi for weld wire fabric
n = 7

Shear:

Based on

$V_c = \{2.14\sqrt{f'_c}+4600\,\frac{A_s}{bd_e}\,\frac{V_u d_e}{M_u}\}\,b.d_e \leq 4.0\sqrt{f'_c}\,b.d_e$ (Pounds)

V_c shall not be less than $3.00\sqrt{f'_c}\,b.d_e$ for frame members and $2.5\sqrt{f'_c}\,b.d_e$ for simply supported members.

Exclusion:

Axial loading on the members has not been considered.

GENERAL NOTES:

Designation:

Standard single or multiple precast box culverts are shown on the plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10'-0" or double 10' x 5' RCB with 20'-0", followed by alternatives.

Alternatives:

Single cell:

Standard dimensions of AASHTO Material Specification 'M259' or 'M273'.

Multiple cell:

Constructed by placing single cells adjacent to each other. Inlet and outlet ends of culvert will be rounded unless square ends are designated. Parapet will be shown unless designated in plans. Such designation may be different for inlet and outlet ends.

Limitations:

Where the overfill is less than 12", Precast RCB culverts are not to be used. Precast RCB culverts are not to be used in siphon or pressurized installations unless appropriate "watertight" jointing is provided.

Special reinforcement coverage:

Precast RCB culvert standard plans are not to be used in a corrosive environment or where there is a severe abrasive flow condition or freeze-thaw locations.

Special design:

Required for culvert with different conditions, loads or design bearing pressures greater than those given on these plans. Required for culverts where end details need higher skew angles, higher parapets or barrier sections.

CONSTRUCTION NOTES:

Cutoff walls:

4'-0" Cutoff walls are to be provided at inlet and/or outlet unless channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant. See Standard Plans D84, D85 and D86A.

Wingwalls:

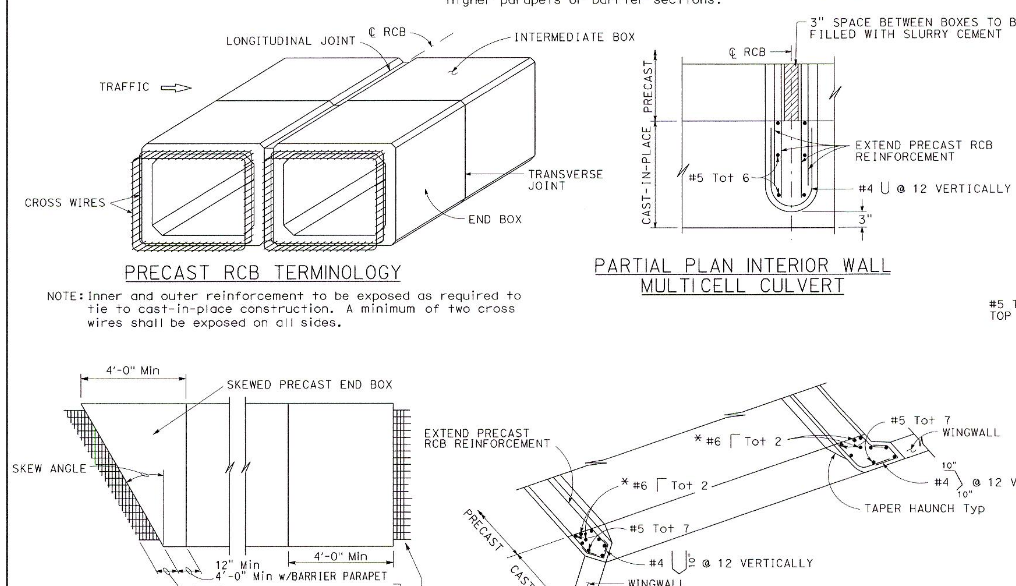
Wingwalls shall be cast-in-place and shall conform to standard plan details for box culvert wingwalls. See Standard Plans D84, D85 and D86A.

Earthwork:

See Standard Plan A62G.

Construction loads:

Strutting may be required near temporary ends. For construction loads on culverts, See Standard Plan D88.



PRECAST RCB TERMINOLOGY

NOTE: Inner and outer reinforcement to be exposed as required to tie to cast-in-place construction. A minimum of two cross wires shall be exposed on all sides.

PARTIAL PLAN INTERIOR WALL MULTICELL CULVERT

PARTIAL PLAN VIEW

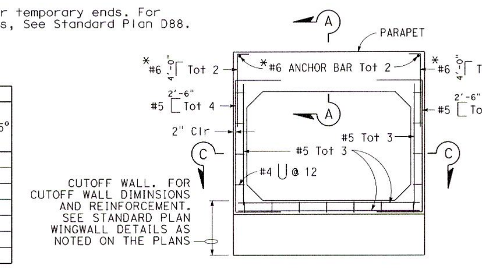
For illustrative purposes only. For correct skew direction see plans.

SECTION C-C

* Reinforcing required for barrier parapet application only.

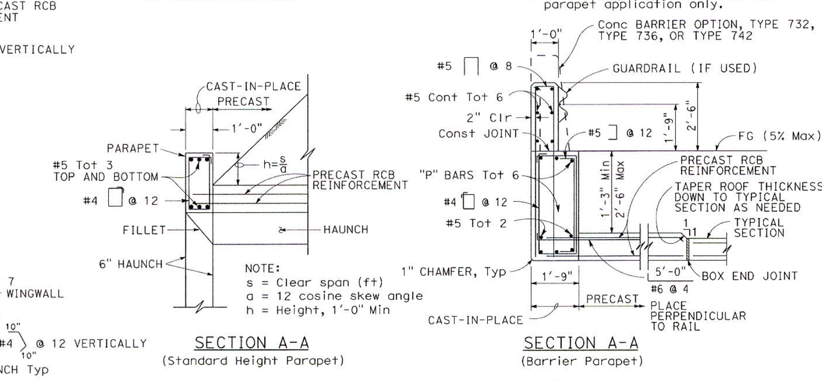
PARAPET "P" BARS			
SKEW ANGLE / SPAN	0° TO 15°	16° TO 30°	31° TO 45°
4'-0"	#5	#5	#5
5'-0"	#5	#5	#6
6'-0"	#6	#6	#6
7'-0"	#7	#7	#7
8'-0"	#7	#7	#8
10'-0"	#8	#8	#9
12'-0"	#9	#9	#10

BARRIER PARAPET REINFORCEMENT



CAST-IN-PLACE END ELEVATION

* Reinforcing required for barrier parapet application only.



NOTE:
s = Clear span (ft)
a = 12 cosine skew angle
h = Height, 1'-0" Min

SECTION A-A (Standard Height Parapet)

SECTION A-A (Barrier Parapet)

TYPICAL CULVERT END DETAILS

For wall and invert reinforcement not shown, See "End Elevation" detail.

2018 STANDARD PLAN D83B

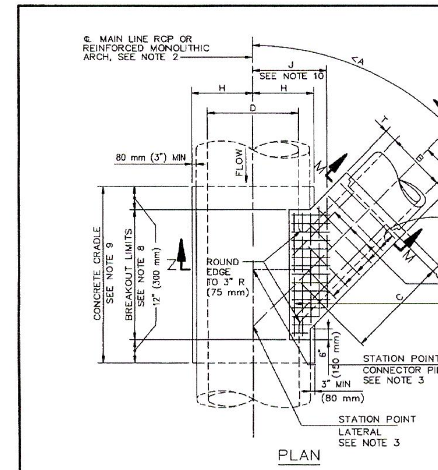
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PRECAST REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS

NO SCALE

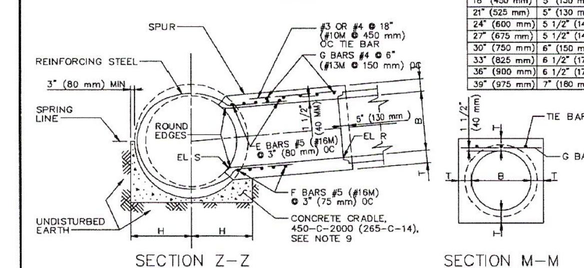
D83B

1-29-18



PLAN

TABLE OF VALUES FOR T	
B	T
12" (300 mm)	5" (130 mm)
15" (375 mm)	5" (130 mm)
18" (450 mm)	5" (130 mm)
21" (525 mm)	5" (130 mm)
24" (600 mm)	5 1/2" (140 mm)
27" (675 mm)	5 1/2" (140 mm)
30" (750 mm)	6" (150 mm)
33" (825 mm)	6 1/2" (170 mm)
36" (900 mm)	6 1/2" (170 mm)
39" (975 mm)	7" (180 mm)



SECTION Z-Z

SECTION M-M

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 1999, 2009

JUNCTION STRUCTURE–PIPE TO PIPE
INLET ID ≥ 24" (600 mm) OR OD > 1/2 MAIN LINE ID

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 331–3 SHEET 1 OF 2

NOTES

1. THIS JUNCTION STRUCTURE SHALL BE USED WHEN THE OUTSIDE DIAMETER OF THE LATERAL IS GREATER THAN 1/2 THE INSIDE DIAMETER D OF THE MAIN LINE; OR WHEN THE INSIDE DIAMETER B OF THE LATERAL IS GREATER THAN 24" (600 mm). B SHALL NOT EXCEED 0.75 D OR 39" (975 mm).
2. IF THE MAIN LINE IS A REINFORCED MONOLITHIC ARCH STORM DRAIN, D SHALL REFER TO THE CLEAR SPAN OF THE ARCH. REINFORCING STEEL SHALL BE CUT AND BENT INTO THE JUNCTION STRUCTURE IN THE SAME MANNER AS FOR A PIPE. A CONCRETE CRADLE IS NOT REQUIRED FOR A REINFORCED MONOLITHIC ARCH.
3. STATIONS SHOWN ON THE PLANS FOR LATERALS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERAL. STATIONS SHOWN ON THE PLANS FOR CATCH BASIN CONNECTOR PIPES APPLY AT THE INTERSECTION OF THE INSIDE WALL OF THE MAIN LINE WITH THE CONNECTOR PIPE CENTERLINE.
4. VALUES FOR A, B, C AND D SHALL BE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S SHALL BE SHOWN ONLY WHEN REQUIRED PER NOTE 5.
5. a. ELEVATIONS R AND S NEED NOT BE SHOWN ON THE PLANS IF THE INLET PIPE IS TO ENTER THE MAIN LINE RADIALLY.
   b. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY IF A STUB IS TO BE PROVIDED IN THE MAIN LINE FOR FUTURE CONNECTION OF AN INLET PIPE.
   c. ELEVATION S SHALL BE SHOWN ON THE PLANS IF AN INLET PIPE IS TO ENTER THE MAIN LINE OTHER THAN RADIALLY. INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO THE CATCH BASIN OR GRADE BREAK IN LINE.
6. THE INLET PIPE SHALL ENTER THE MAIN LINE RADIALLY UNLESS OTHERWISE INDICATED. THE INLET PIPE MAY ENTER THE MAIN LINE OTHER THAN RADIALLY IF ANGLE A IS GREATER THAN 45°, B IS LESS THAN OR EQUAL TO 24" (600 mm) AND THE OUTSIDE DIAMETER OF THE INLET PIPE IS LESS THAN 0.5 D: OTHERWISE, SPPWC 340 SHALL BE USED.
7. NO MORE THAN ONE OPENING SHALL BE MADE IN ANY ONE SECTION OF PIPE.
8. THE OPENING FOR THE BREAKOUT SHALL BE RECTANGULAR AND CUT NORMAL TO THE PIPE SURFACE WITHOUT DAMAGING THE REINFORCING STEEL. THE TRANSVERSE REINFORCEMENT OF THE MAIN LINE SHALL BE CUT AT THE CENTER OF THE OPENING AND BENT INTO THE TOP AND BOTTOM SLABS OF THE SPUR.
9. THE MAIN LINE SHALL BE REINFORCED WITH A CONCRETE CRADLE AND ENCASEMENT (AS APPLICABLE). A CONCRETE ENCASEMENT IS REQUIRED IF A JOINT IN THE MAIN LINE FALLS WITHIN THE LIMITS OF THE CRADLE. THE CONCRETE ENCASEMENT SHALL EXTEND 12" (300 mm) ABOVE THE TOP OF THE MAIN LINE AND TO THE LIMITS OF THE CRADLE. IF CONNECTING TO AN EXISTING STORM DRAIN, PORTION OF CRADLE OPPOSITE INLET MAY BE OMITTED.
10. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, (ASTM A 615M, GRADE 300), AND BE PLACED 1 1/2" (40 mm) CLEAR FROM CONCRETE SURFACES, UNLESS OTHERWISE SHOWN F BARS SHALL BE CARRIED TO A POINT NOT LESS THAN J DISTANCE FROM CENTER LINE WITH J=7D/12 + 6" (150 mm).
11. FLOOR OF THE SPUR SHALL BE STEEL–TROWELED TO THE SPRING LINE OF THE SPUR.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

JUNCTION STRUCTURE–PIPE TO PIPE
INLET ID≥24" (600 mm) OR OD>1/2 MAIN LINE ID

STANDARD PLAN 331–3 SHEET 2 OF 2

Know what's **below.** Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: ______ 8/8/22
CITY ENGINEER DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK
DATE: 04/26/2022
DRAWN BY: PK/BK
DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No. 85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 15 OF 21
CONTRACT ______
ACCOUNT ______
DWG. NO. AA 5949 SD

D14499 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 – 4:05pm by: Brent.King

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Carl M. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

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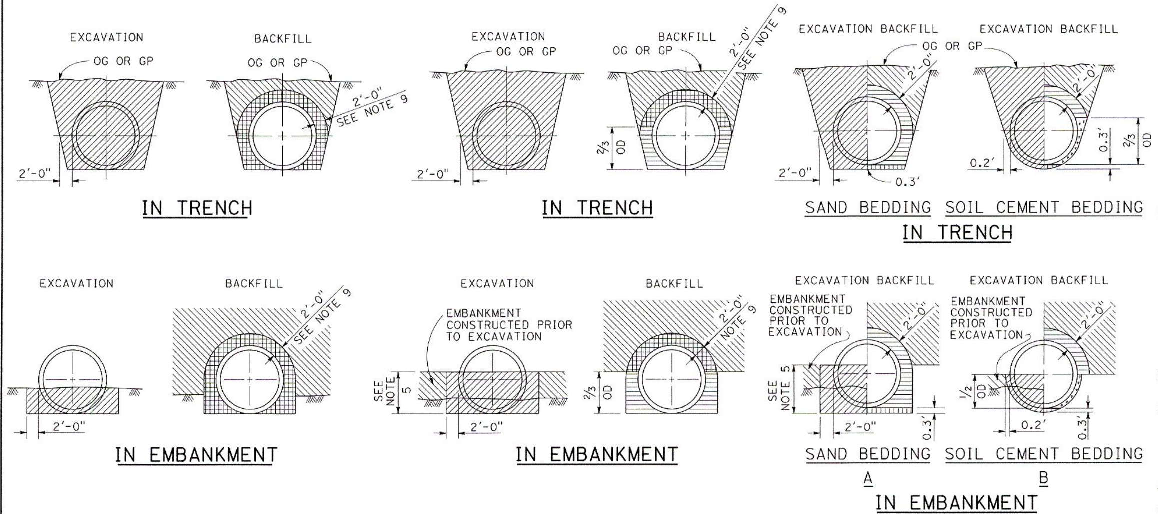


MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 1

COVER	MINIMUM CLASS AND D-LOAD
5.9'	CLASS II 1000D
6.0' - 7.9'	CLASS III 1350D
8.0' - 9.9'	CLASS III SPECIAL 1700D
10.0' - 11.9'	CLASS IV 2000D
12.0' - 13.9'	CLASS IV SPECIAL 2500D
14.0' - 16.9'	CLASS V 3000D
17.0' - 20.0'	CLASS V SPECIAL 3600D

See Notes 6 and 9

METHOD 1

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 2

COVER	MINIMUM CLASS AND D-LOAD
15.9'	CLASS II 1000D
16.0' - 19.9'	CLASS III 1350D
20.0' - 24.9'	CLASS III SPECIAL 1700D
25.0' - 27.9'	CLASS IV 2000D
28.0' - 34.9'	CLASS IV SPECIAL 2500D
35.0' - 41.9'	CLASS V 3000D
42.0' - 50.0'	CLASS V SPECIAL 3600D

See Notes 8 and 9

METHOD 2

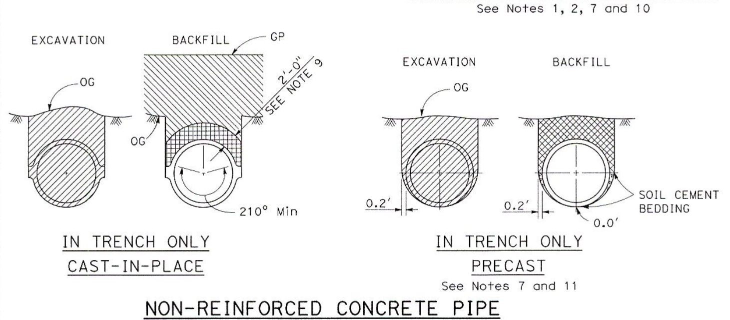
MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 3

COVER	MINIMUM CLASS AND D-LOAD
25.9'	Class II 1000D
26.0' - 31.9'	Class III 1350D
32.0' - 37.9'	Class III Special 1700D
38.0' - 44.9'	Class IV 2000D
45.0' - 55.9'	Class IV Special 2500D
56.0' - 67.9'	Class V 3000D
68.0' - 80.0'	Class V Special 3600D

METHOD 3

REINFORCED CONCRETE PIPE

See Notes 1, 2, 7 and 10



See Notes 7 and 11

NON-REINFORCED CONCRETE PIPE

LEGEND

- STRUCTURE EXCAVATION (CULVERT)
- SAND BEDDING
- STRUCTURE BACKFILL (CULVERT) 95% RELATIVE COMPACTION
- SOIL CEMENT BEDDING
- STRUCTURE BACKFILL (CULVERT) 90% RELATIVE COMPACTION
- ROADWAY EMBANKMENT
- LOOSE BACKFILL

OD = OUTSIDE DIAMETER FOR CIRCULAR PIPES AND MAXIMUM VERTICAL DIMENSION FOR OTHER SHAPES

ID = INSIDE DIAMETER FOR CIRCULAR PIPES AND MINIMUM VERTICAL DIMENSION FOR OTHER SHAPES

NOTES:

1. Unless otherwise shown on the plans or specified in the special provisions, the Contractor shall have the option of selecting the class of RCP and the method of backfill to be used, provided the height of cover does not exceed the value shown for the RCP selected.
   Example:
   2'-0" RCP culvert with maximum cover of 19'-0" the options are:
   a) Class V Special or stronger with Method 1.
   b) Class III or stronger with Method 2.
   c) Class II or stronger with Method 3.
   Cover is defined as the maximum vertical distance from top of pipe to finished grade within the length of any given culvert.
2. The class of RCP, method of backfill and bedding selected shall be the same throughout the length of any given culvert.
3. The "length of any culvert" is defined as the culvert between:
   a) Successive drainage structures (inlets, junction boxes, headwalls, etc.).
   b) A drainage structure and the inlet or outlet end of the culvert.
   c) The inlet and outlet end of the culvert when there are no intervening drainage structures.
4. Slope or shore excavation sides as necessary.
5. Embankment height prior to excavation for installation of all classes of RCP under Methods 2 and 3A shall be as follows:
   Pipe sizes 1'-0" to 3'-6", I D = 2'-6"
   Pipe sizes 4'-0" to 7'-0", I D = ⅔ OD
   Pipe sizes larger than 7'-0", I D = 5'-0"
6. The maximum size for all classes of RCP placed under Method 1 is 6'-6" ID.
7. Non-reinforced precast pipe sizes 3'-0" or smaller may also be placed under Methods 1, 2 or 3.
8. Oval or arch shaped RCP shall be placed under Method 2 only.
9. Embankment compaction requirements govern over the 90% relative compaction backfill requirement within 2'-6" of finished grade.
10. Backfill shall be placed full width of excavation except where dimensions are shown for backfill width or thickness. Dimensions shown are minimums.
11. Where the precast non-reinforced concrete pipe is used as a substitute for the cast-in-place pipe, both the wall thickness and the concrete strength shall be at least as great as that specified for the cast-in-place pipe. The fill height allowed shall not exceed that shown for the cast-in-place pipe.

2018 STANDARD PLAN A62D

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

EXCAVATION AND BACKFILL CONCRETE PIPE CULVERTS

NO SCALE

A62D

1-26-18

31

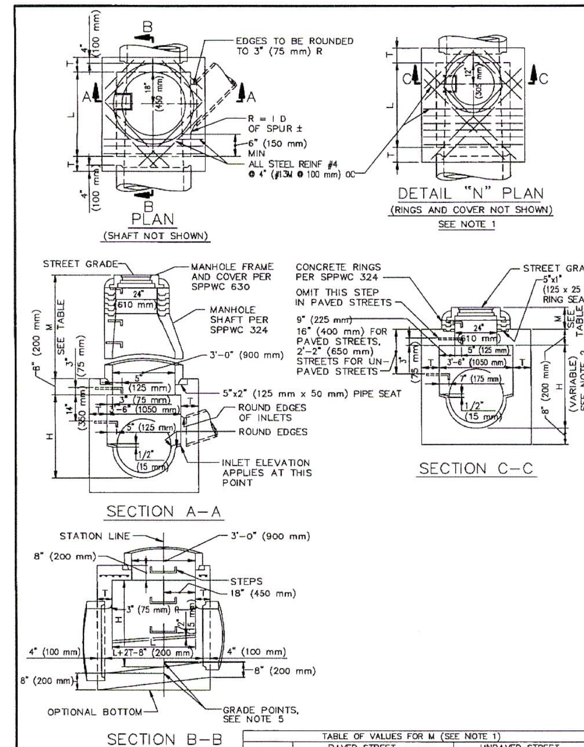


TABLE OF VALUES FOR M (SEE NOTE 1)

SECTION	PAVED STREET MAX	PAVED STREET MIN	UNPAVED STREET MAX	UNPAVED STREET MIN
A-A		2'-10 1/2" (867 mm)		3'-6" (1060 mm)
C-C	11" (282 mm)	8 1/2" (217 mm)	16" (410 mm)	15" (380 mm)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS 33" (825 mm) OR SMALLER)

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 321-2 SHEET 1 OF 3

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" (867 mm) FOR PAVED STREETS OR 3'-6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT SHAFT PER SECTION C-C AND DETAIL "N". DEPTH M MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6" (150 mm) WHEN LARGER VALUES OF M WOULD REDUCE H IN SECTION C-C TO 3'-6" (1060 mm) OR LESS.
2. H (IN SECTION A-A AND B-B) SHALL NOT BE LESS THAN 4'-0" (1.2 m), BUT MAY BE INCREASED PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SECTION C-C) SEE NOTE 1.
3. L SHALL BE 4'-0" (1.2 m) UNLESS OTHERWISE SHOWN. L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF THE SPUR MUST BE APPROVED BY THE ENGINEER.
4. T SHALL BE 8" (200 mm) FOR VALUES OF H UP TO AND INCLUDING 8'-0" (2.4 m) AND 10" (250 mm) FOR VALUES OF H OVER 8'-0" (2.4 m).
5. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES. SEE NOTE 3.
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN 8" (200 mm).
10. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE LEDGE AT THE SIDE OF THE MANHOLE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS = 33" (825 mm) OR SMALLER)

STANDARD PLAN 321-2 SHEET 2 OF 3

Know what's **below.** **Call 811 before you dig.**

CITY OF CHINO

RECOMMENDED BY: ______ 8/8/22
CITY ENGINEER DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 16 OF 21
CONTRACT ______
ACCOUNT ______
DWG. NO. AA 5949SD

D 14500 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Carl W. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

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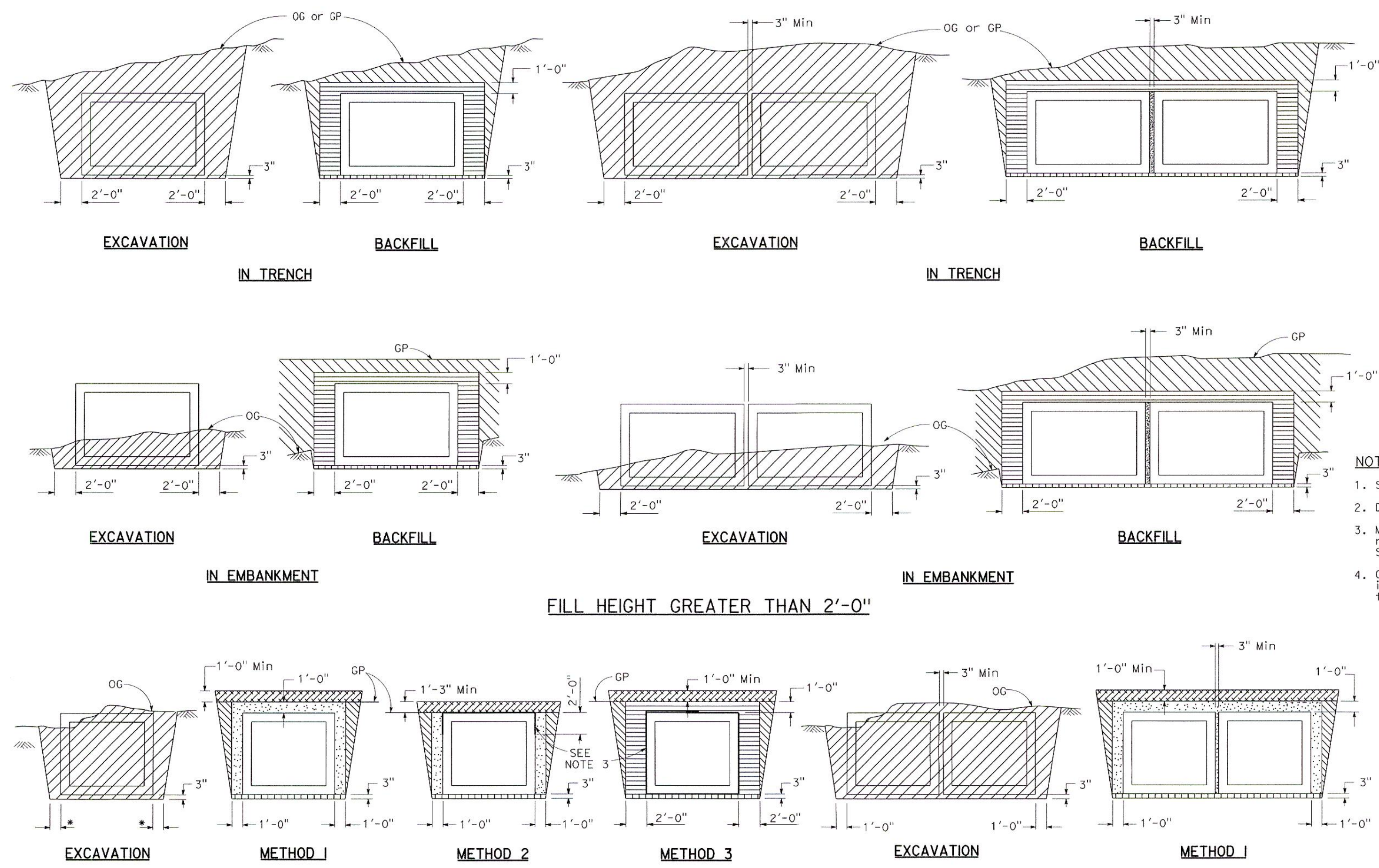


* 1'-0" Where Method 1 or 2 Backfill is used. 2'-0" Where Method 3 Backfill is used.

LEGEND:

- STRUCTURE EXCAVATION (CULVERT)
- STRUCTURE BACKFILL (CULVERT) 95% RELATIVE COMPACTION
- ROADWAY EMBANKMENT
- SLURRY CEMENT BACKFILL
- SAND BEDDING (CULVERT)
- ROADWAY PAVEMENT STRUCTURE

NOTES:

1. Slope or shore excavation sides as necessary.
2. Dimensions shown are minimum.
3. Method 2 and 3 for single or multiple boxes requires an approved external sealing band. See Standard Plan D83A.
4. Construction of Roadway Pavement Structure in Method 2 or Method 3 shall not disturb the external sealing band installation.

2018 STANDARD PLAN A62G

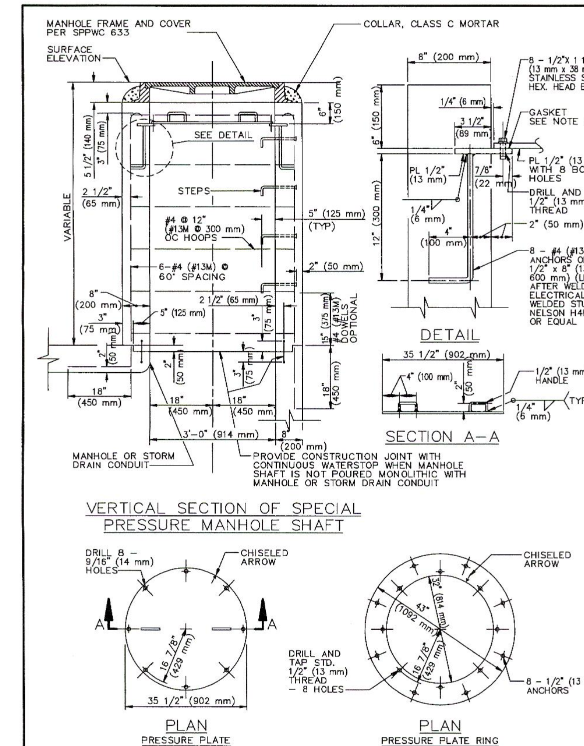
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

EXCAVATION AND BACKFILL PRECAST REINFORCED CONCRETE BOX CULVERT

NO SCALE

A62G

1-29-18



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1962 REV. 1996, 2009

PRESSURE MANHOLE SHAFT AND PRESSURE PLATE DETAIL 36" (914 mm) WITHOUT REDUCER

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 329-2 SHEET 1 OF 2

NOTES

1. THIS STRUCTURE MAY BE USED FOR HYDROSTATIC HEADS UP TO 25' (7.5 m) ABOVE THE PRESSURE PLATE.
2. 36" (914 mm) MANHOLE FRAME AND COVER PER SPPWC 633 SHALL BE USED.
3. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. HOOPS MAY BE ELECTRICALLY BUTT WELDED OR THE ENDS LAPPED 18" (450 mm).
4. THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE CONDUIT BELOW.
5. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC.
6. GASKET MATERIAL SHALL BE NEOPRENE (OR EQUAL) 1/16" (2 mm) THICK BY 1 1/4" (32 mm) WIDE.
7. BOLTS SHALL BE STAINLESS STEEL CONFORMING TO ASTM A 320 (ASTM A 320M), GRADE B8.
8. PRESSURE PLATE AND PRESSURE PLATE RING SHALL BE STEEL CONFORMING TO ASTM A 36 (ASTM A 36M) AND SHALL BE GALVANIZED. PLATES SHALL BE MARKED IN SETS AND A CHISELED ARROW STAMPED ON BOTH PLATES, AFTER DRILLING AND TAPPING, TO FACILITATE FIELD ASSEMBLY.
9. SEE CONTRACT SPECIFICATIONS FOR PHYSICAL REQUIREMENTS OF WATERSTOP.
10. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

633 36" (914 mm) MANHOLE FRAME AND COVER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PRESSURE MANHOLE SHAFT AND PRESSURE PLATE DETAIL 36" (914mm) WITHOUT REDUCER

STANDARD PLAN 329-2 SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

811 Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: ________ 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 17 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14501 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King

Span 4' and 5'

SPAN, S	4'						5'							
HEIGHT, H	2'		3'		4'		2'		3'		4'		5'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	7"	7½"	7"	7½"	7"	7½"	7"	9"	7"	9"	7"	9"	7"	9"
Conc WALLS T_2	6"	6½"	6½"	7"	7"	8"	6"	6½"	6½"	7½"	7½"	8"	8"	9½"
Conc INVERT T_3	7"	7½"	7"	7½"	7"	7½"	7½"	9"	7½"	9"	8"	9"	8"	9"
Reinf SPACING	12"	12"	12"	12"	12"	12"	11½"	12"	11½"	12"	11½"	12"	11½"	12"
Reinf "g" SIZE BAR	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7	#4	#7
Reinf "f" SIZE BAR	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5	#5
Reinf "a" SIZE BAR	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf "e" SIZE BAR	#4	#4	#4	#5	#5	#6	#4	#4	#4	#5	#5	#6	#5	#7
QUANTITIES CONCRETE CF/LF	14.1	15.1	15.9	17.1	17.9	19.6	16.9	20.5	18.8	22.9	21.7	25.1	24.0	28.5
QUANTITIES REINFORCEMENT LB/LF	109	109	115	122	130	141	133	130	139	145	156	164	163	192
** SOIL PRESSURE (ksf)	2.1	4.1	2.2	4.1	2.2	4.1	3.2	4.1	3.2	4.1	3.2	4.1	3.3	4.2

Span 6' and 7'

SPAN, S	6'								7'									
HEIGHT, H	3'		4'		5'		6'		3'		4'		5'		6'		7'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	7"	10½"	7"	10½"	7"	10½"	7"	10½"	7½"	11½"	7½"	11½"	7½"	11½"	7½"	11½"	8"	11½"
Conc WALLS T_2	6½"	7½"	7"	8½"	7½"	10"	8½"	11"	6½"	7½"	7½"	8"	7½"	9½"	8½"	11"	9½"	13"
Conc INVERT T_3	8½"	10½"	8½"	10½"	8½"	10½"	8½"	10½"	9½"	12"	9½"	12"	9½"	12"	9½"	12"	9½"	12"
Reinf SPACING	11½"	12"	11½"	12"	11½"	12"	11½"	12"	11"	10½"	11"	10½"	11"	10½"	11"	10½"	11"	10½"
Reinf "g" SIZE BAR	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7
Reinf "f" SIZE BAR	#5	#5	#5	#5	#5	#6	#5	#6	#6	#5	#6	#5	#6	#6	#6	#6	#6	#6
Reinf "a" SIZE BAR	#7	#4	#7	#4	#7	#4	#7	#4	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf "e" SIZE BAR	#4	#5	#5	#6	#6	#6	#6	#7	#4	#5	#5	#6	#6	#6	#6	#7	#6	#7
QUANTITIES CONCRETE CF/LF	22.3	29.3	24.3	32.0	26.5	35.6	29.5	38.5	26.8	36.1	29.3	38.3	31.1	41.9	34.0	46.0	38.0	51.3
QUANTITIES REINFORCEMENT LB/LF	202	167	218	188	239	213	250	243	237	209	254	232	275	262	287	298	299	317
** SOIL PRESSURE (ksf)	3.1	4.1	3.1	4.2	3.1	4.2	3.1	4.2	3.0	4.1	3.0	4.2	3.0	4.2	3.0	4.2	3.1	4.3

Span 8'

SPAN, S	8'									
HEIGHT, H	4'		5'		6'		7'		8'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8½"	13"	8½"	13"	8½"	13"	8½"	13"	8½"	13"
Conc WALLS T_2	6½"	8"	7½"	9½"	8½"	11½"	9½"	13"	11"	15"
Conc INVERT T_3	10½"	13½"	10½"	13½"	10½"	13½"	10½"	13½"	10½"	13½"
Reinf SPACING	9"	10"	9"	10"	9"	10"	9"	10"	9"	10"
Reinf "g" SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "f" SIZE BAR	#5	#6	#5	#6	#5	#6	#5	#6	#5	#6
Reinf "a" SIZE BAR	#6	#4	#6	#4	#6	#4	#6	#4	#6	#4
Reinf "e" SIZE BAR	#5	#6	#5	#6	#6	#6	#6	#7	#6	#7
QUANTITIES CONCRETE CF/LF	34.2	46.7	36.9	50.4	39.9	55.2	43.2	59.9	47.7	66.0
QUANTITIES REINFORCEMENT LB/LF	334	287	345	301	376	317	390	359	406	378
** SOIL PRESSURE (ksf)	2.9	4.2	2.9	4.2	3.0	4.3	3.0	4.3	3.0	4.4

Span 10'

SPAN, S	10'											
HEIGHT, H	5'		6'		7'		8'		9'		10'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	10½"	15½"	10½"	15½"	10½"	15½"	10½"	15½"	10½"	15½"	10½"	15½"
Conc WALLS T_2	8½"	8½"	8½"	9½"	8½"	10½"	9"	12"	10"	13½"	11"	15"
Conc INVERT T_3	10½"	16"	10½"	16"	10½"	16"	10½"	16"	10½"	16"	10½"	16"
Reinf SPACING	11"	7½"	10½"	7½"	10"	8"	10"	8"	10½"	8"	10½"	8½"
Reinf "g" SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "f" SIZE BAR	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6
Reinf "a" SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5
Reinf "b" SIZE BAR	#5	#5	#4	#5	#5	#5	#6	#5	#6	#6	#6	#6
Reinf "b" Dim "B" ft-inch	1-9	2-7	2-0	2-9	2-3	2-9	2-7	3-1	2-7	3-1	2-7	3-1
Reinf "b" Dim "Bw" ft-inch	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11	4-0	4-11
Reinf "c" SIZE BAR	#5	#6	#6	#6	#6	#6	#6	#6	#7	#6	#7	#6
Reinf "c" Dim "C" ft-inch	3-1	2-9	3-9	3-3	4-6	4-3	5-6	4-6	6-0	4-9	6-0	4-9
* "e" SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5
QUANTITIES CONCRETE CF/LF	49.1	68.4	51.1	71.9	53.2	75.8	56.1	80.8	60.1	86.4	64.4	92.5
QUANTITIES REINFORCEMENT LB/LF	393	520	427	542	473	538	509	559	534	599	568	636
** SOIL PRESSURE (ksf)	2.8	4.8	2.8	4.9	2.9	4.9	2.9	4.9	2.9	4.9	2.9	5.0

Span 12'

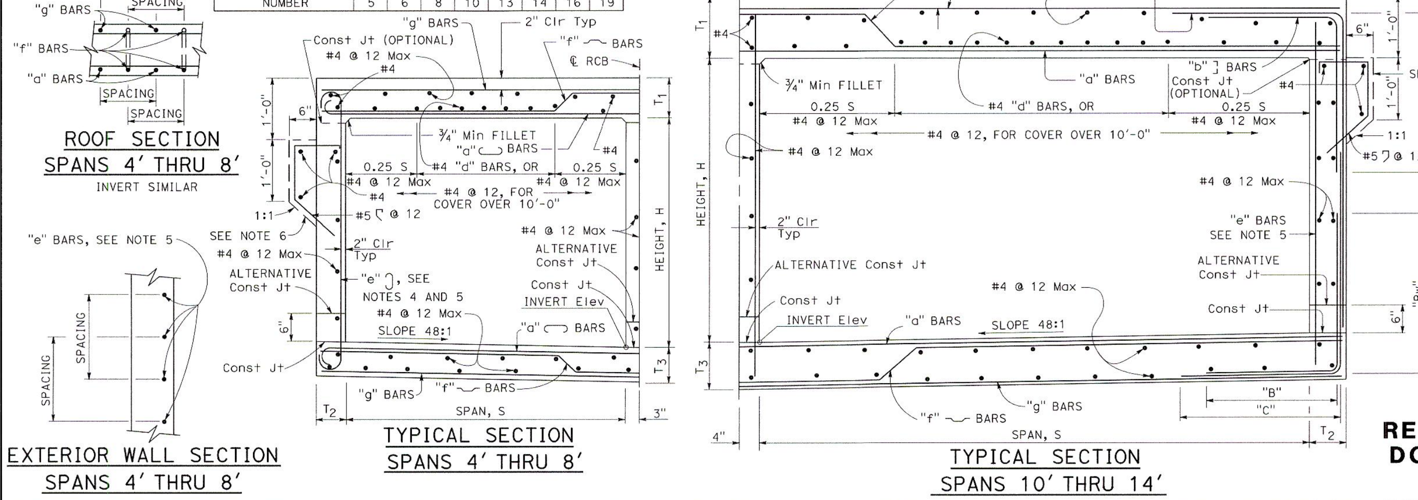
SPAN, S	12'													
HEIGHT, H	6'		7'		8'		9'		10'		11'		12'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	11½"	18"	11½"	18"	11½"	18"	11½"	18"	11½"	18"	11½"	18"	11½"	18"
Conc WALLS T_2	8½"	9½"	8½"	10½"	9"	12"	10"	13½"	11"	15"	12½"	16½"	13½"	18½"
Conc INVERT T_3	12"	19"	12"	19"	12"	19"	12"	19"	12"	19"	12"	19"	12"	19"
Reinf SPACING	9"	8"	9"	8"	8"	7½"	8"	7½"	8½"	7½"	8½"	8"	8½"	8"
Reinf "g" SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "f" SIZE BAR	#7	#8	#7	#8	#7	#7	#7	#7	#7	#7	#7	#8	#7	#8
Reinf "a" SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf "b" SIZE BAR	#5	#6	#5	#6	#6	#6	#6	#6	#6	#6	#5	#6	#6	#6
Reinf "b" Dim "B" ft-inch	2-7	3-1	3-0	3-2	3-6	3-2	3-6	3-4	3-9	3-4	3-9	3-4	3-9	3-4
Reinf "b" Dim "Bw" ft-inch	4-1	3-2	4-1	3-4	4-1	3-4	4-1	3-7	3-9	3-7	3-9	3-7	3-7	3-7
Reinf "c" SIZE BAR	#6	#6	#6	#6	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7
Reinf "c" Dim "C" ft-inch	3-10	3-7	4-6	4-4	5-7	5-0	6-6	5-2	7-2	5-4	7-5	5-7	7-5	5-7
* "e" SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5
QUANTITIES CONCRETE CF/LF	63.6	94.4	65.7	98.4	68.6	104	72.6	109	76.9	115	82.6	122	87.7	131
QUANTITIES REINFORCEMENT LB/LF	563	686	584	711	691	721	715	745	700	764	767	867	804	890
** SOIL PRESSURE (ksf)	2.8	4.8	2.8	4.9	2.8	4.9	2.8	4.9	2.8	4.9	2.9	5.0	2.9	5.0

Span 14'

SPAN, S	14'															
HEIGHT, H	7'		8'		9'		10'		11'		12'		13'		14'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"	13"	20½"
Conc WALLS T_2	9"	11"	9"	12"	10"	13½"	11½"	15"	12½"	17"	13½"	18½"	15"	20"	16½"	22"
Conc INVERT T_3	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"	13½"	21½"
Reinf SPACING	8½"	8"	8½"	8"	8½"	8"	8½"	8"	8½"	8"	8½"	8"	9"	8"	9"	8"
Reinf "g" SIZE BAR	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8
Reinf "f" SIZE BAR	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8	#7	#8
Reinf "a" SIZE BAR	#4	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Reinf "b" SIZE BAR	#5	#6	#6	#6	#5	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7
Reinf "b" Dim "B" ft-inch	2-7	2-7	3-3	3-3	4-0	4-0	4-0	4-0	4-7	4-4	4-7	4-11	5-3	4-11	5-3	4-11
Reinf "b" Dim "Bw" ft-inch	5-0	3-9	5-0	4-6	5-0	5-0	5-0	5-0	4-9	5-6	4-9	6-2	5-2	6-2	5-2	6-2
Reinf "c" SIZE BAR	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8
Reinf "c" Dim "C" ft-inch	4-3	3-11	5-6	5-2	7-9	5-8	8-6	6-5	8-10	6-6	9-0	6-10	9-3	6-10	9-3	6-10
* "e" SIZE BAR	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5	#6	#6
QUANTITIES CONCRETE CF/LF	88.8	124	84.0	129	88.0	134	93.4	141	98	149	103	156	110	164	117	174
QUANTITIES REINFORCEMENT LB/LF	734	878	785	919	842	956	892	985	916	1015	964	1120	980	1141	1095	1269
** SOIL PRESSURE (ksf)	2.8	4.8	2.8	4.9	2.8	4.9	2.8	4.9	2.8	5.0	2.9	5.0	2.9	5.0	2.9	5.1

* See Note 5
** See Note 9

"d" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10'-0"								
SPAN	4'	5'	6'	7'	8'	10'	12'	14'
NUMBER	5	6	8	10	13	14	16	19



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018

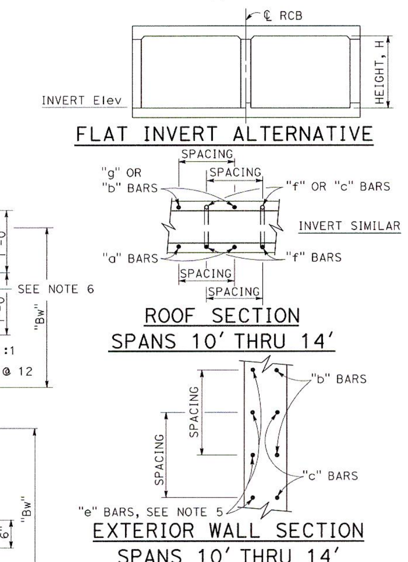
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER Carl M. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

NOTES:

1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. For boxes with span or height or cover greater than those shown in tables, a special design is required.
3. Quantities are approximate and for design purposes only.
4. It is permissible to eliminate the 180° hooks on every other "e" bar.
5. "e" bars are at half spacing.
6. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
7. For design and details not shown, see Standard Plan D82.
8. This plan sheet may be used for multiple cell culverts by making necessary adjustments.
9. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE DOUBLE BOX CULVERT

NO SCALE

D81

2018 STANDARD PLAN D81

222

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

ENCROACHMENT PERMIT SURVEY GRID

TR-0151 (REV. 09/2006)

LEGEND:

- Octagon Data Points required when the diameter is < 8'.
- Octagon & Triangle Data Points required when the diameter is > 8'.
- Settlement Rod may be required when the diameter is > 5'. (Settlement Rod Detail is located in Appendix E of the Encroachment Permits Manual)

EP Edge of Pavement

ETW Edge of Travel Way (Fog line, Yellow Stripe, etc.)

S Offset Distance away from the pipe alignment, as follows:

3' for casing pipe diameters < 30"

5' for casing pipe diameters 30" - 72"

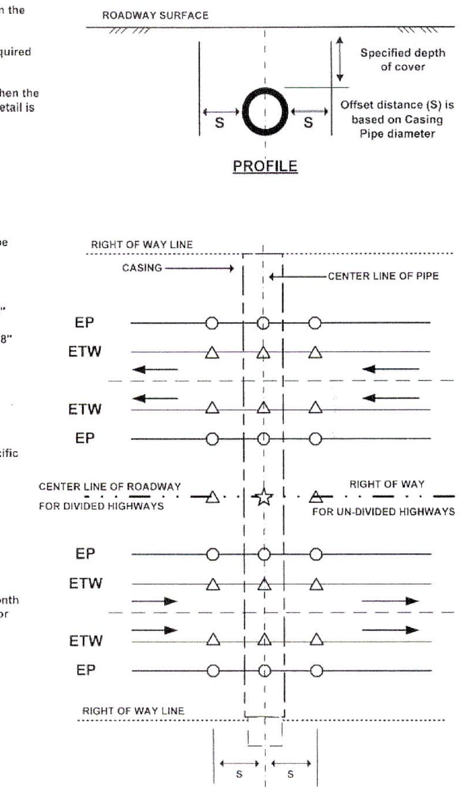
10' for casing pipe diameters 72" - 108"

15' for casing pipe diameters > 108"

NOTES:

Survey data is to be collected at the specific points along the casing alignment at the following times:

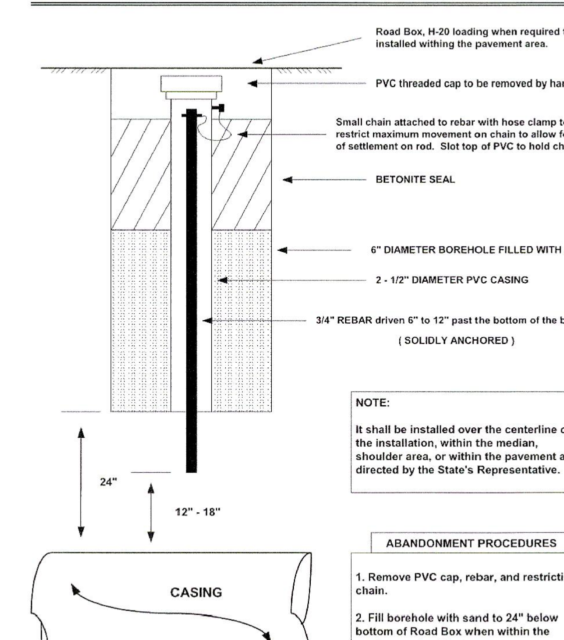
1. Prior to Start of Work.
2. Every two (2) hours continuously throughout the project.
3. Upon completion of the project.
4. Every two (2) months, during a six month period after the date of completion, and or As Required by the Department.



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

ENCROACHMENT PERMIT SETTLEMENT ROD DETAIL

TR-0152 (REV. 09/2006)



NOTE:

It shall be installed over the centerline of the installation, within the median, shoulder area, or within the pavement as directed by the State's Representative.

ABANDONMENT PROCEDURES

1. Remove PVC cap, rebar, and restriction chain.
2. Fill borehole with sand to 24" below bottom of Road Box when within the median or shoulder areas.
3. Fill remainder of borehole with Bentonite seal mixture.
4. Remove Road Box and back fill with an approved backfill.

CONTINGENCY PLAN
(DEFORMATION LIMITS AND CORRECTIVE ACTION)

A. DEFORMATION LIMITS IDENTIFIED HEREIN AS THRESHOLD VALUES, CONTRACTOR CORRECTIVE ACTION VALUES, AND PROJECT SHUTDOWN VALUES FOR VARIOUS FEATURES BEING MONITORED ARE PROVIDED IN TABLE 1, RESPONSE VALUES OF MEASURED DEFORMATION.
B. CONTRACTOR'S CORRECTIVE ACTIONS, AS REQUIRED HEREIN, SHALL BE APPROVED BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.
C. WHEN ANY OF THOSE ESTABLISHED MONITORING POINT'S MEASUREMENT INDICATES MOVEMENT EQUALS TO 50 PERCENT OF THE SHUTDOWN VALUE HAS OCCURRED, THE THRESHOLD VALUE IS SAID TO HAVE BEEN REACHED. AT THIS TIME, THE CONTRACTOR SHALL MEET WITH THE DEPARTMENT TO DISCUSS HIS/HER CONSTRUCTION MEANS AND METHODS TO DETERMINE WHAT CHANGES, IF ANY, SHALL BE MADE TO BETTER CONTROL GROUND MOVEMENT AND PREVENT DEFORMATION OF MONITORED FEATURES. MEASUREMENTS SHALL BE REQUIRED EVERY 2-HOURS, UNLESS MORE STRINGENTLY SPECIFIED, UNTIL FIVE CONSECUTIVE WORKING DAYS OF READINGS OBSERVED BEING BELOW THE THRESHOLD VALUE.
D. WHEN ANY OF THOSE ESTABLISHED MONITORING POINT'S MEASUREMENT INDICATES MOVEMENT EQUALS TO 75 PERCENT OF THE SHUTDOWN VALUE HAS OCCURRED, CONTRACTORS CORRECTIVE ACTION VALUE IS SAID TO HAVE BEEN REACHED. AT THIS TIME, THE CONTRACTOR SHALL ACTIVELY CONTROL GROUND MOVEMENT IN ACCORDANCE WITH THE APPROVED PLAN TO PREVENT DEFORMATION BEYOND THE CONTRACTOR CORRECTIVE ACTION VALUE. MEASUREMENTS SHALL BE REQUIRED EVERY 2-HOURS, UNLESS MORE STRINGENTLY SPECIFIED, UNTIL FIVE CONSECUTIVE WORKING DAYS OF READINGS OBSERVED BEING BELOW THE THRESHOLD VALUE.
E. WHEN ANY OF THOSE ESTABLISHED MONITORING POINT'S MEASUREMENT INDICATES MOVEMENT EQUALS TO 100 PERCENT OF THE SHUTDOWN VALUE HAS OCCURRED, THE SHUTDOWN VALUE IS SAID TO HAVE BEEN REACHED. AT THIS TIME, THE CONTRACTOR SHALL STOP ALL EXCAVATION WORK IMMEDIATELY, AND SHALL CONTINUE IMPLEMENTING MEASURES TO PREVENT FURTHER DEFORMATIONS, AND SHALL MEET THE DEPARTMENT TO DEVELOP A PLAN OF ACTION BEFORE EXCAVATION WORK CAN BE RESUMED.

PROTECTION AND PLACEMENT

A. ALL INSTRUMENTS AND INSTRUMENTATION POINTS SHALL BE PROTECTED FROM DAMAGE.
B. ALL INSTRUMENTS AND INSTRUMENTATION POINT DAMAGE RESULTING FROM CONSTRUCTION OPERATIONS, WEATHER, TRAFFIC, OR VANDALISM SHALL BE REPAIRED OR REPLACED AND RE-INSTALLED AT NO ADDITIONAL COST PRIOR TO CONTINUING TUNNELING, OR AS REQUIRED BY THE DEPARTMENT.

TABLE 1 - RESPONSE VALUES OF MEASURED DEFORMATION

INSTRUMENTATION DEVISE	MONITORED FEATURE	THRESHOLD VALUE (FEET)	CONTRACTOR CORRECTIVE ACTION VALUE (FEET)	SHUTDOWN VALUE (FEET)
TOTAL MOVEMENT OF INDIVIDUAL SETTLEMENT MONUMENTS	ROADWAY (SR-83 BETWEEN PM 3.92-4.42	0.01	0.015	0.02

Know what's below. Call 811 before you dig.

CITY OF CHINO

RECOMMENDED BY: 8/8/22
CITY ENGINEER DATE

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO

DESIGNED BY: PK/BK
DATE: 04/26/2022
DRAWN BY: PK/BK
DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN

EUCLID AVENUE

DETAILS

PM-20016

SHEET 18 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 59498D

D14502 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King

221

2018 STANDARD PLAN D80

SPAN, S	4'						5'							
HEIGHT, H	2'		3'		4'		2'		3'		4'		5'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	7"	7½"	7"	7½"	7"	7½"	7½"	8"	7½"	8"	7½"	8"	7½"	8"
Conc WALLS T_2	6"	6"	6½"	6½"	7"	7½"	6"	6"	6½"	6½"	7"	7"	6½"	8"
Conc INVERT T_3	7"	7½"	7"	7½"	7"	7½"	7½"	8"	7½"	8"	7½"	8"	7½"	8"
Reinf SPACING	7"	6"	7"	6"	7"	6"	8½"	6"	8½"	5½"	8"	5½"	8"	5"
Reinf "a" SIZE BAR	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#6
Reinf "e" SIZE BAR	#4	#4	#5	#6	#5	#6	#4	#4	#5	#5	#5	#6	#6	#6
QUANTITIES CONCRETE CF/LF	7.8	8.3	9.2	9.6	10.7	11.6	9.5	10.0	10.9	11.4	12.4	12.9	14.1	15.1
QUANTITIES REINFORCEMENT LB/LF	47.7	51.1	57.8	71.4	63.5	80.8	57.8	73.7	66.6	92.5	83.0	111	101	114
*** SOIL PRESSURE (ksf)	2.4	4.5	2.4	4.5	2.5	4.6	2.4	4.5	2.4	4.5	2.5	4.6	2.5	4.6

SPAN, S	6'							
HEIGHT, H	3'		4'		5'		6'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8"	9"	8"	9"	8"	9"	8"	9"
Conc WALLS T_2	7"	7"	7"	7"	7½"	8"	8"	9½"
Conc INVERT T_3	8"	9"	8"	9"	8"	9½"	8"	9½"
Reinf SPACING	7½"	5"	7½"	5"	7"	5"	7"	4½"
Reinf "a" SIZE BAR	#7	#6	#7	#6	#7	#6	#7	#6
Reinf "e" SIZE BAR	#4	#5	#6	#6	#6	#6	#7	#6
QUANTITIES CONCRETE CF/LF	13.1	14.3	14.2	15.4	15.9	18.0	17.8	21.2
QUANTITIES REINFORCEMENT LB/LF	77.6	94.7	96.6	114	110	126	132	152
*** SOIL PRESSURE (ksf)	2.4	4.6	2.5	4.6	2.5	4.6	2.5	4.7

SPAN, S	7'									
HEIGHT, H	3'		4'		5'		6'		7'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8"	10"	8"	10"	8"	10½"	8½"	10½"	8½"	10½"
Conc WALLS T_2	6½"	7"	6½"	7½"	7"	8"	7½"	9½"	8½"	11"
Conc INVERT T_3	8"	10½"	8"	10½"	8"	10½"	8"	10½"	8½"	10½"
Reinf SPACING	6"	4½"	6"	4½"	6"	5½"	6"	5½"	6"	5½"
Reinf "a" SIZE BAR	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7
Reinf "e" SIZE BAR	#4	#4	#5	#5	#6	#7	#7	#7	#7	#7
QUANTITIES CONCRETE CF/LF	14.0	17.5	15.1	19.1	16.7	21.3	18.8	24.5	21.8	28.3
QUANTITIES REINFORCEMENT LB/LF	102	106	115	124	134	166	160	181	173	196
*** SOIL PRESSURE (ksf)	2.4	4.6	2.4	4.6	2.5	4.7	2.5	4.7	2.6	4.8

SPAN, S	8'									
HEIGHT, H	4'		5'		6'		7'		8'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	8½"	11½"	8½"	11½"	8½"	11½"	8½"	11½"	8½"	11½"
Conc WALLS T_2	6½"	7½"	7"	8½"	7½"	9½"	8½"	11"	9"	12½"
Conc INVERT T_3	8½"	11½"	8½"	11½"	8½"	12"	8½"	12"	8½"	12"
Reinf SPACING	5½"	5"	5½"	5"	6"	4½"	5½"	4½"	5½"	4½"
Reinf "a" SIZE BAR	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
Reinf "e" SIZE BAR	#5	#6	#6	#6	#7	#6	#7	#7	#7	#7
QUANTITIES CONCRETE CF/LF	17.2	22.7	18.8	25.1	20.6	28.3	23.3	32.1	25.5	36.4
QUANTITIES REINFORCEMENT LB/LF	135	166	156	177	184	208	197	252	209	269
*** SOIL PRESSURE (ksf)	2.4	4.6	2.5	4.7	2.5	4.7	2.6	4.8	2.6	4.9

"d" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10'-0"							
SPAN	4'	5'	6'	7'	8'	10'	12'	14'
NUMBER	7	8	9	10	11	12	15	20

SPAN, S	10'											
HEIGHT, H	5'		6'		7'		8'		9'		10'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	9½"	12"	9½"	12"	9½"	12"	9½"	12"	9½"	12"	9½"	12"
Conc WALLS T_2	8½"	8½"	8½"	9½"	9"	10½"	9"	12"	10"	13½"	11"	15"
Conc INVERT T_3	10"	12½"	10"	12½"	10"	12½"	10"	13"	10"	13"	10"	13"
Reinf SPACING	11"	12"	12"	12"	11"	11"	10"	11"	10"	10"	11"	10"
Reinf **"a" SIZE BAR	#7	#8	#7	#8	#7	#7	#6	#7	#6	#7	#7	#7
Reinf "b" SIZE BAR	#7	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7
Reinf "b" DIMENSION "B" ft-inch	2-11	2-11	2-11	3-0	2-11	3-9	2-11	3-9	2-11	3-9	2-11	3-9
Reinf "b" DIMENSION "Bw" ft-inch	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-10	5-0	4-7	4-7
Reinf "c" SIZE BAR #	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7
Reinf "c" DIMENSION "C" ft-inch	3-4	3-6	7-4	4-8	7-7	4-8	8-2	4-8	7-7	5-2	7-7	5-11
Reinf *"e" SIZE BAR	#4	#4	#4	#5	#6	#6	#6	#7	#7	#7	#8	#8
QUANTITIES CONCRETE CF/LF	25.1	30.4	27.1	33.1	29.2	36.2	30.7	41	34	45.8	37.6	51
QUANTITIES REINFORCEMENT LB/LF	271	296	278	333	341	366	359	406	428	469	487	530
*** SOIL PRESSURE (ksf)	3.7	4.7	3.8	4.7	3.8	4.8	3.8	4.8	3.9	4.9	3.9	5.0

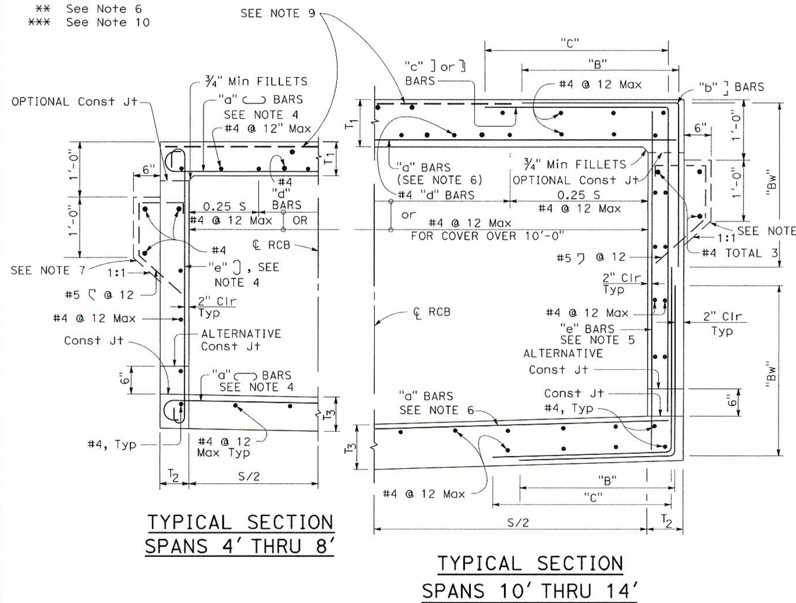
SPAN, S	12'													
HEIGHT, H	6'		7'		8'		9'		10'		11'		12'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"	10½"	14½"
Conc WALLS T_2	9"	10½"	9"	10½"	9½"	12"	10"	13½"	11"	15"	12½"	16½"	13½"	18"
Conc INVERT T_3	11"	14½"	11"	15"	11"	15"	11"	15"	11½"	15"	11½"	15½"	11½"	15½"
Reinf SPACING	9"	10"	9"	10"	9"	10"	8"	10"	8"	10"	10"	9"	9"	8"
Reinf **"a" SIZE BAR	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#6	#6
Reinf "b" SIZE BAR	#6	#7	#6	#7	#6	#7	#6	#8	#7	#8	#7	#8	#6	#7
Reinf "b" DIMENSION "B" ft-inch	3-1	3-2	3-9	3-9	3-9	3-9	3-7	3-9	3-7	4-4	3-7	4-4	4-4	4-4
Reinf "b" DIMENSION "Bw" ft-inch	6-0	5-10	6-2	6-7	6-2	6-7	4-11	4-11	4-11	4-11	4-11	4-11	4-4	4-4
Reinf "c" SIZE BAR #	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7
Reinf "c" DIMENSION "C" ft-inch	4-4	3-10	8-1	5-7	8-1	5-7	8-1	5-7	8-1	5-7	8-1	6-4	8-1	6-10
Reinf *"e" SIZE BAR	#4	#4	#4	#4	#4	#5	#4	#5	#5	#5	#6	#6	#6	#6
QUANTITIES CONCRETE CF/LF	33.2	43.7	34.7	46.1	37	50.4	39.5	55.3	43.7	60.6	48.7	67.1	53.1	73.5
QUANTITIES REINFORCEMENT LB/LF	322	371	379	417	390	449	430	477	499	500	527	610	530	614
*** SOIL PRESSURE (ksf)	3.6	4.8	3.6	4.8	3.6	4.9	3.6	4.9	3.7	5.0	3.7	5.0	3.8	5.1

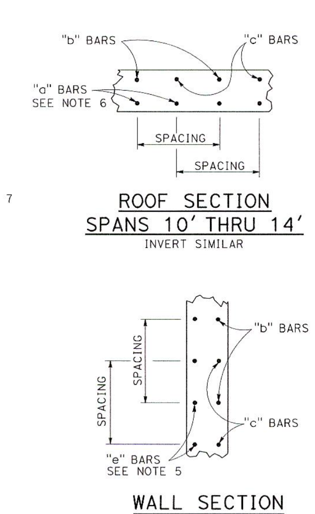
SPAN, S	14'															
HEIGHT, H	7'		8'		9'		10'		11'		12'		13'		14'	
MAXIMUM EARTH COVER	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'	10'	20'
Conc ROOF T_1	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"	12"	16½"
Conc WALLS T_2	9½"	11"	9½"	12"	10"	13½"	11½"	15"	12½"	16½"	13½"	18"	15"	19½"	16½"	21½"
Conc INVERT T_3	12½"	17"	12½"	17"	12½"	17"	12½"	17½"	12½"	17½"	13"	17½"	13"	18"	13"	18"
Reinf SPACING	10"	9"	10"	9"	10"	8"	10"	8"	9"	8"	8"	10"	10"	10"	10"	9"
Reinf **"a" SIZE BAR	#7	#8	#7	#8	#7	#7	#7	#7	#7	#7	#6	#8	#7	#7	#7	#7
Reinf "b" SIZE BAR	#7	#7	#7	#7	#7	#7	#8	#7	#8	#7	#7	#8	#7	#8	#8	#8
Reinf "b" DIMENSION "B" ft-inch	2-9	4-2	3-4	4-4	3-4	4-6	3-5	4-6	3-6	4-6	3-6	4-6	3-6	4-6	4-9	6-0
Reinf "b" DIMENSION "Bw" ft-inch	6-5	7-0	7-0	8-4	7-0	8-4	6-0	6-0	6-0	6-0	6-0	6-0	5-0	6-0	4-6	6-0
Reinf "c" SIZE BAR #	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8
Reinf "c" DIMENSION "C" ft-inch	4-3	4-2	6-9	6-9	5-10	5-10	6-0	6-4	8-11	6-4	8-11	7-0	8-11	7-7	8-11	7-9
Reinf *"e" SIZE BAR	#4	#4	#4	#4	#4	#4	#5	#5	#5	#5	#5	#6	#7	#7	#7	#7
QUANTITIES CONCRETE CF/LF	42.9	57	44.5	60.7	47	65.6	51.7	71.8	55.8	77.7	60.9	84.2	66.9	91.8	73.4	101
QUANTITIES REINFORCEMENT LB/LF	413	529	467	595	467	608	526	632	633	651	630	717	688	737	747	861
*** SOIL PRESSURE (ksf)	3.4	4.9	3.5	4.9	3.5	4.9	3.5	5.0	3.6	5.1	3.6	5.1	3.7	5.2	3.7	5.3

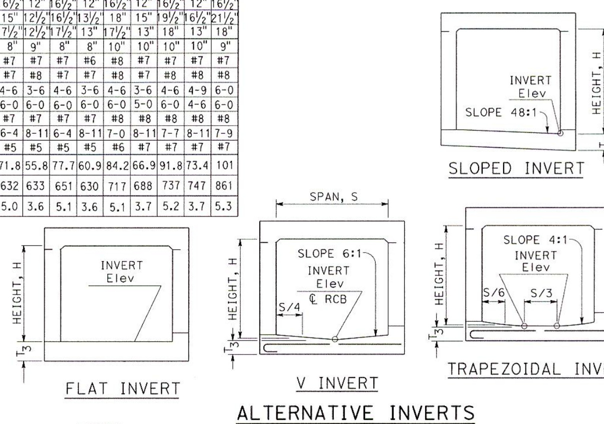
* See Note 5
** See Note 6
*** See Note 10

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER Cori W. Duan No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA







NOTES:

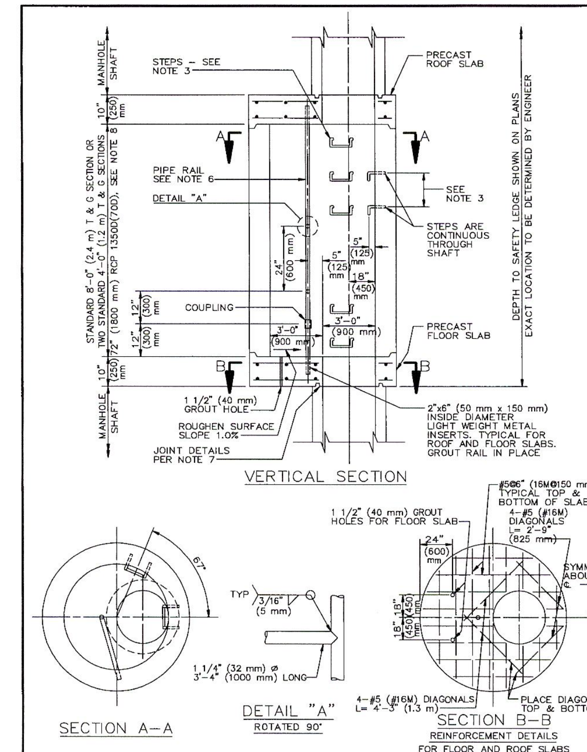
1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. Quantities are approximate and for design purposes only.
3. For boxes with span or height or cover greater than those shown in tables, a special design is required.
4. It is permissible to eliminate the 180° hooks on every other bar.
5. "e" bars are at half spacing (spans 10' - 14' only).
6. "a" bars are at half spacing (spans 10' - 14' only).
7. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
8. For design and details not shown, see Standard Plan D82.
9. For exposed top, provide #4 @ 12 each way, lap "c" bars 2'-0" or use full span length.
10. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT

NO SCALE

D80



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1982 REV. 1996, 2009
MANHOLE SHAFT SAFETY LEDGE
STANDARD PLAN 330-2
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
SHEET 1 OF 2

NOTES

1. MANHOLE SHAFT SAFETY LEDGE WILL BE NOTED ON THE PLANS WHEN REQUIRED. IT IS TO BE CONSTRUCTED WHEN DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
2. A SAFETY LEDGE SHALL NOT BE USED IF A PRESSURE MANHOLE IS REQUIRED.
3. STEPS SHALL CONFORM TO SPPWC 635 OR 636 AND SHALL BE ANCHORED 4" (100 mm) IN THE WALL OF THE STRUCTURE. STEPS SHALL BE PLACED TO MATCH THE SPACING OF THE MANHOLE SHAFT.
4. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300) AND SHALL TERMINATE 2" (50 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
5. GROUT HOLES, PIPE AND FITTINGS SHALL BE PROVIDED IN THE FLOOR SLAB. PRESSURE GROUTING SHALL BE USED TO FILL VOIDS AND TO SECURE UNIFORM BEARING. THE GROUT SHALL BE NEAT CEMENT GROUT AND GROUTING PRESSURES SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
6. PIPE RAIL SHALL BE FABRICATED OF 1 1/4" (32 mm) STANDARD GALVANIZED PIPE COMPOSED OF TWO SECTIONS 7'-6" (2.25 m) & 18" (450 mm) IN LENGTH JOINED BY A GALVANIZED COUPLING. THE COUPLING SHALL BE THREADED A MINIMUM OF 2" (50 mm) ON EACH PIPE LENGTH.
7. ROOF AND FLOOR SLABS SHALL BE PRECAST AND KEYED FOR REINFORCED CONCRETE PIPE SECTIONS AS SHOWN. ALL JOINTS SHALL BE FILLED WITH CLASS C MORTAR AND NEATLY POINTED OR WIPED ON THE INSIDE.
8. 72" (1800 mm) RCP SHALL BE PROVIDED WITH TWO CIRCULAR CAGES OF REINFORCEMENT.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

   324 MANHOLE SHAFT - WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT - 36" (900 mm) WITHOUT REDUCER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
MANHOLE SHAFT SAFETY LEDGE
STANDARD PLAN 330-2
SHEET 2 OF 2

CALTRANS # 08-22-6-UT-0007

811 Know what's below. Call 811 before you dig.

CITY OF CHINO
RECOMMENDED BY: 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER For 7/28/22 DATE

BENCH MARK No. CG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO CG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No. 85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

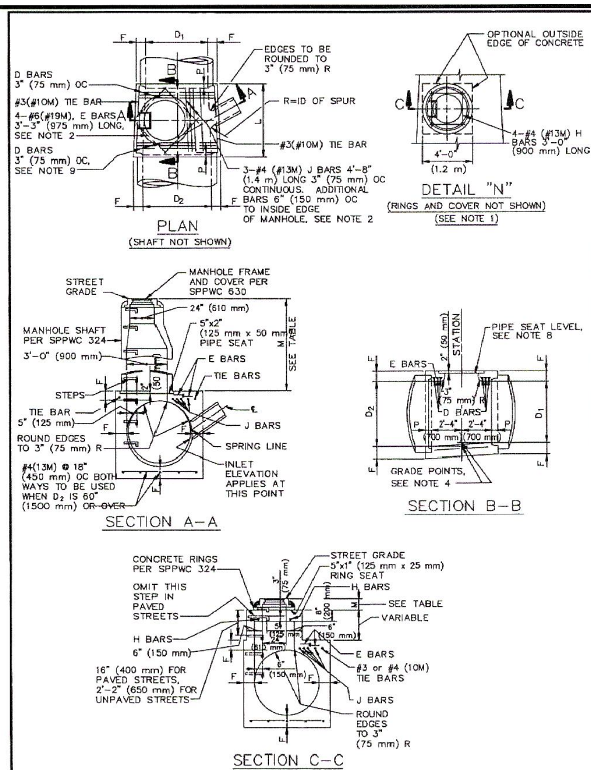
STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

SHEET 19 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14503 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009	MANHOLE PIPE–TO–PIPE MAIN LINE ID=36" (900 mm) OR LARGER USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN 320–2 SHEET 1 OF 4

TABLE OF VALUES FOR F	
D2	F
36" (900 mm)	6 1/2" (165 mm)
39" (975 mm)	7" (180 mm)
42" (1050 mm)	7 1/2" (190 mm)
45" (1125 mm)	7 3/4" (195 mm)
48" (1200 mm)	8" (205 mm)
51" (1275 mm)	8 1/2" (215 mm)
54" (1350 mm)	9" (230 mm)
57" (1425 mm)	9 1/4" (235 mm)
60" (1500 mm)	9 1/2" (240 mm)
63" (1575 mm)	10" (255 mm)
66" (1650 mm)	10 1/4" (260 mm)
69" (1725 mm)	10 3/4" (275 mm)
72" (1800 mm)	11" (280 mm)
78" (1950 mm)	11 3/4" (300 mm)
84" (2100 mm)	12 1/2" (320 mm)
90" (2250 mm)	13 1/4" (335 mm)
96" (2400 mm)	14" (355 mm)
102" (2550 mm)	15 1/2" (395 mm)
108" (2700 mm)	16" (405 mm)
114" (2850 mm)	16 1/2" (420 mm)
120" (3000 mm)	17" (430 mm)
126" (3150 mm)	17" (430 mm)
132" (3300 mm)	17 1/2" (445 mm)
138" (3450 mm)	17 1/2" (445 mm)
144" (3600 mm)	18" (455 mm)

TABLE OF VALUES FOR M (SEE NOTE 1)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN	MAX	MIN
A–A		2'–10 1/2" (867 mm)		3'–6" (1060 mm)
C–C	11" (282 mm)	8 1/2" (217 mm)	16" (410 mm)	15" (380 mm)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION — MANHOLE PIPE–TO–PIPE MAIN LINE ID = 36" (900 mm) OR LARGER — STANDARD PLAN 320–2 SHEET 2 OF 4

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'–10 1/2" (867 mm) FOR PAVED STREETS OR 3'–6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C–C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C–C. WHEN DIAMETER D_1 IS 48" (1200 mm) OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 2.
2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D_1 IS 48" (1200 mm) OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE AND OMIT J BARS.
3. L AND P SHALL HAVE THE FOLLOWING VALUES UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS:
   A. D_2=96" (2400 mm) OR LESS, L=5'–6" (1.7 m), P=5" (130 mm)
   B. D_2 OVER 96" (2400 mm), L=6'–0" (1.8 m), P=8" (210 mm)
   L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS. WHEN L GREATER THAN THAT SHOWN ABOVE IS SPECIFIED, D BARS SHALL BE CONTINUED 6" (150 mm) OC.
4. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES.
5. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
6. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
7. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
8. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES FOR F SHOWN ON SHEET 2.
9. D BARS SHALL BE #4 (#13M) FOR D_2=39" (975 mm) OR LESS, #5 (#16M) FOR D_2= 42" (1050 mm) TO 84" (2100 mm) INCLUSIVE AND #6 (#19M) FOR D_2= 90" (2250 mm) OR OVER.
10. CENTERLINE OF INLET PIPE SHALL INTERSECT INSIDE FACE OF CONE AT SPRING LINE UNLESS OTHERWISE SHOWN.
11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
   A. MAIN LINE = 36" (900 mm) INSIDE DIAMETER OR LARGER. EXCEPT IF THE MAIN LINE RCP DOWNSTREAM OF MANHOLE IS 36" (900 mm) TO 42" (1050 mm) INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" (825 mm) OR LESS SPPWC 321 SHALL BE USED.

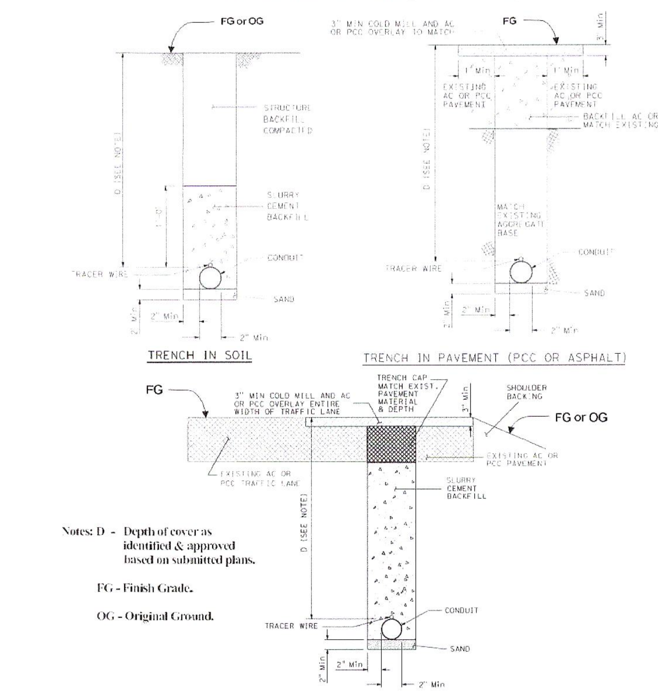
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION — MANHOLE PIPE–TO–PIPE MAIN LINE ID = 36" (900 mm) OR LARGER — STANDARD PLAN 320–2 SHEET 3 OF 4

   B. THE OUTSIDE DIAMETER OF THE LATERAL MUST BE LESS THAN OR EQUAL TO 1/2 THE INSIDE DIAMETER OF THE MAIN LINE. IF THE UPSTREAM AND DOWNSTREAM DIAMETERS OF THE MANHOLE ARE NOT THE SAME, THE GOVERNING INSIDE DIAMETER OF THE MAIN LINE SHALL BE CONSIDERED TO BE THAT WHERE THE EXTENDED CENTERLINE OF THE LATERAL ENTERS THE MANHOLE.
   C. IN NO INSTANCE SHALL THE INSIDE DIAMETER OF THE LATERAL TO THE MANHOLE BE GREATER THAN 30" (750 mm).
13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
   324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
   328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
   329 PRESSURE MANHOLE SHAFT 36" (914 mm) WITHOUT REDUCER
   630 24" (610 mm) MANHOLE FRAME AND COVER
   633 36" (914 mm) MANHOLE FRAME AND COVER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION — MANHOLE PIPE–TO–PIPE MAIN LINE ID = 36" (900 mm) OR LARGER — STANDARD PLAN 320–2 SHEET 4 OF 4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT TRENCH DETAIL
TR-0153 (Rev. 11/2019) Page 1 of 2

TYPICAL TRENCH DETAIL (NOT TO SCALE)



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT TRENCH DETAIL
TR-0153 (Rev. 11/2019) Page 2 of 2

- **All work must be authorized by the encroachment permit, and/or as directed by the State's representative.**
- **A tracer wire must be placed on top of the conduit unless specified not to.**
- **Clearance between the trench wall and encroachment work less than 6 inches in width shall be a minimum of 2 inches. Clearance between the trench wall and encroachment work greater than 6 inches width shall be a minimum of 6 inches.**
- **When the trench width is less than 2' the backfill for subgrade must consist of either slurry cement or Controlled Low-Strength Material (CLSM).**
- **When trench width is greater than 2' compacted aggregate base may be used for backfill.**
- **Structure backfill must conform to Section 19-3.02C of the Standard Specifications.**
- **For trench located under unimproved surface, structure backfill can use the original soil. Soil must be compacted by mechanical means. Ponding, jetting or flooding are not allowed. Slurry cement backfill is optional at the discretion of the Caltrans District.**
- **Slurry cement backfill must conform to Section 19-3.02E of the Standard Specifications.**
- **Aggregate base shall conform to Section 26 of the Standard Specifications.**
- **CLSM must conform to Section 19-3.02G of the Standard Specifications. When CLSM is utilized the mix design and test results must be submitted to the State's representative. See Appendix H of the Encroachment Permits Manual for additional information.**
- **Cold planed surface and overlay shall be to the nearest lane line for the entire length of the trench/disturbed areas, and/or as directed by the State's representative.**
- **A paving notch ("T" Cut) shall be cold planed in exist asphalt concrete to a minimum width of 1.0' beyond each side of the trench and to a depth of 3" for the final layer of HMA.**
- **HMA or PCC to replace pavement section shall match existing pavement depth, unless directed otherwise by the State's representative.**
- **Hot mix asphalt must conform to Section 39 of the Standard Specifications.**
- **A tack coat of asphaltic emulsion conforming to Section 39-2.01C (3) (f) shall be applied.**
- **When the trench is within 4' of curb and gutter, additional cold planing may be required at the discretion of the State's representative.**
- **Pavement markings and/or striping removed or damaged during construction must be replaced as directed by the State's representative.**
- **Other trench related details are shown in Chapter 6 of the Encroachment Permits Manual as well as the Trenching and Shoring Manual. Both publications can be found on the State of California, Department of Transportation's website.**

CALTRANS # 08-22-6-UT-0007

Know what's below. Call 811 before you dig.

CITY OF CHINO
RECOMMENDED BY: [signature] 8/8/22
CITY ENGINEER DATE

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY:
DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/20/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER 7/20/22 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

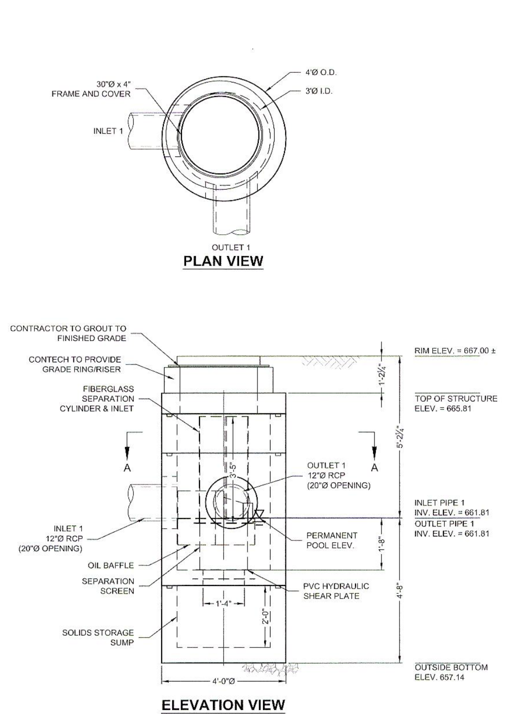
WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

SHEET 20 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949SD
D1454 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:06pm by: Brent.King



MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET AND CYLINDER	CONTECH
1	4700 micron, 1.5' O.D. x 1.5' SEP. SCREEN	CONTECH
1	3/16 INCH PVC HYDRAULIC SHEAR PLATE *	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1 PLC	GRADE RINGS/RISERS	CONTRACTOR
1	30"Ø x 4" FRAME & COVER, EJ#00181011 9A01, OR EQUIV.	CONTRACTOR

* SEE HYDRAULIC SHEAR PLATE DETAIL

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 4000 LBS.
STRUCTURE IS DELIVERED IN 4 PIECES

MAX FOOTPRINT = Ø4'

CONTECH **CONTRACT** DRAWING

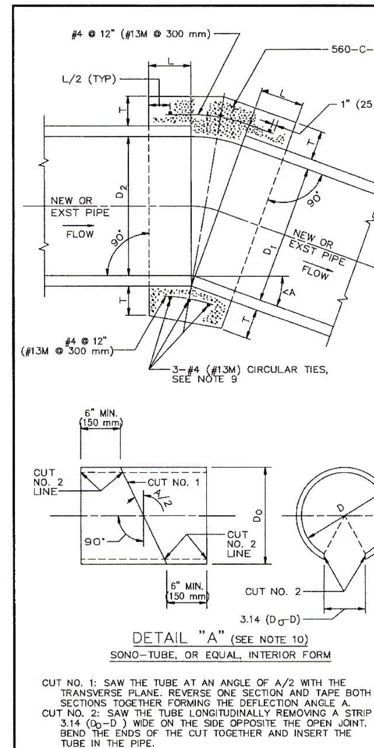
PRECS LAYOUT 4A 1515-3-FGIS 5850 / 453627

CDS1515-3-C 686090-10
MERRILL AVE
ONTARIO, CA
###

CONTECH ENGINEERED SOLUTIONS LLC

DATE: 08/16/21	SCALE: 3/8" = 1'-0"
DESIGNED: RLH	DRAWN: RLH
CHECKED: ###	APPROVED: ###
PROJECT No.: 686090	SEQUENCE No.: 10
SHEET: 1 OF 1	

MARK | DATE | REVISION DESCRIPTION | BY



D	L	T
12" (300 mm)	12" (300 mm)	4" (100 mm)
18" (450 mm)	12" (300 mm)	5" (125 mm)
24" (600 mm)	12" (300 mm)	6" (150 mm)
30" (750 mm)	18" (450 mm)	7" (175 mm)
36" (900 mm)	18" (450 mm)	9" (225 mm)
42" (1050 mm)	18" (450 mm)	9" (225 mm)
48" (1200 mm)	18" (450 mm)	10" (250 mm)
57" (1425 mm)	18" (450 mm)	10" (250 mm)
60" (1500 mm)	21" (525 mm)	11" (275 mm)
66" (1650 mm)	21" (525 mm)	11" (275 mm)
72" (1800 mm)	24" (600 mm)	12" (300 mm)

CUT NO. 1: SAW THE TUBE AT AN ANGLE OF A/2 WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A.
CUT NO. 2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP 3.14 (D_0-D) WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE CUT TOGETHER AND INSERT THE TUBE IN THE PIPE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 1997, 1999, 2009
CONCRETE COLLAR FOR RCB 12" (300 mm) THROUGH 72" (1800 mm)
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STANDARD PLAN **380–4** SHEET 1 OF 2

NOTES

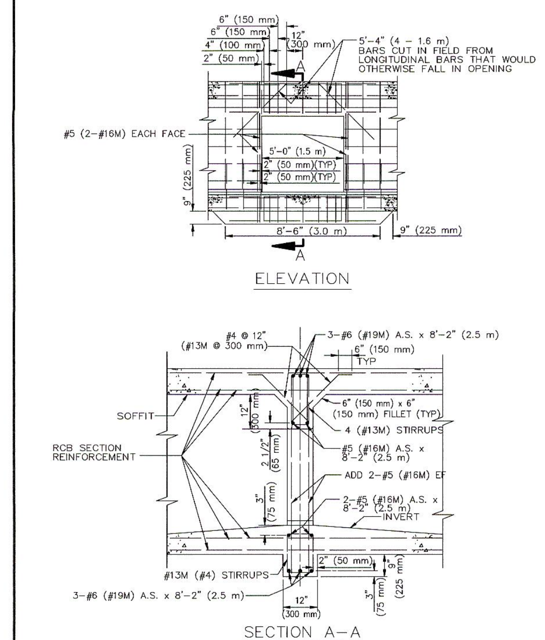
1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10%.
2. FOR CURVE JOINTS (SEE DETAIL B, SHEET 1)
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 1" (25 mm), BUT IS LESS THAN 3" (75 mm) A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SSPWC 306–1.2.4.
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 3" (75 mm), BUT LESS THAN 6" (150 mm), A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 6" (150 mm) OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
   A. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. $D=D_1$ OR D_2, WHICHEVER IS GREATER.
   B. WHEN D_1 IS EQUAL TO OR LESS THAN D_2, JOIN INVERTS AND WHEN D_1 IS GREATER THAN D_2, JOIN SOFFITS.
5. FOR PIPE LARGER THAN 72" (1800 mm) SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 (A 615 M) GRADE 40 (300).
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2X WALL THICKNESS) + T.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21" (525 mm) AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 3" (75 mm) OR LARGER.

   CIRCULAR TIES:

PIPE DIAMETER	NO. OF CIRCULAR TIES
21" (525 mm) OR LESS	3
24" (600 mm) TO 30" (750 mm)	3
33" (825 mm) TO 57" (1425 mm)	4
60" (1500 mm) TO 72" (1800 mm)	5

   WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 3" (75 mm), THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" (150 mm) O.C.
10. WHERE THE PIPE IS 21" (525 mm) OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO–TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 24" (600 mm) OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
CONCRETE COLLAR FOR RCB 12" (300 mm) THROUGH 72" (1800 mm)
STANDARD PLAN **380–4** SHEET 2 OF 2



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009
WINDOW DETAILS FOR MULTIPLE RCB STRUCTURES
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STANDARD PLAN **382–2** SHEET 1 OF 2

NOTES

1. THIS STRUCTURE MAY BE USED WHERE:
   a. DEPTH OF COVER DOES NOT EXCEED 10' (3.0 m).
   b. CLEAR SPAN OF ONE BARREL DOES NOT EXCEED 12' (3.6 m). WHEN THESE LIMITS ARE EXCEEDED, WINDOW OPENING DETAILS SHALL BE AS SHOWN ON PLANS.
2. LONGITUDINAL BARS SHALL BE CUT IN THE FIELD 2" (50 mm) FROM OPENING.
3. ROUND ALL EDGES TO 2" (50 mm) RADIUS.
4. NO TRANSVERSE CONSTRUCTION JOINT SHALL BE PLACED WITHIN 5'–0" (1.5 m) OF WINDOW.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
WINDOW DETAILS FOR MULTIPLE RCB STRUCTURES
STANDARD PLAN **382–2** SHEET 2 OF 2

Know what's **below.** **Call 811 before you dig.**

CALTRANS # 08-22-6-UT-0007

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: PK/BK DATE: 04/26/2022
DRAWN BY: PK/BK DATE: 04/26/2022
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER 7/28/22 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER FOR 7/28/22 DATE

BENCH MARK No. GG–18–1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG–18–1." SET ON TOP OF CURB. APPROX 5' +/– SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989–9789 FAX: (909) 989–9660
SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 6/22/22 DATE

STORM DRAIN IMPROVEMENT PLAN
EUCLID AVENUE
DETAILS

PM-20016

SHEET 21 OF 21
CONTRACT
ACCOUNT
DWG. NO. AA 5949 SD

D14505 06/03/2022

Drawing Name: P:\Year_2020\2020-015 REDA Phase II Final Engineering\05 Engineering\Sheets\OFF-SITE\STORM DRAIN EUCLID\11_21_2020-015_SD_DET.dwg
Last Opened: Jun 03, 2022 - 4:07pm by: Brent.King

EXCERPT D: STORM DRAIN IMPROVEMENT PLAN FOR PM-20714 SCHAEFER AVENUE FROM EUCLID AVENUE TO SULTANA AVENUE

STORM DRAIN IMPROVEMENT PLAN
FOR PM 20714
SCHAEFER AVENUE
FROM EUCLID AVENUE TO SULTANA AVENUE
IN THE CITY OF ONTARIO

CITY OF ONTARIO GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AND CALTRANS PERMIT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS REFERRED TO SECTION 7-10.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION"

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

UTILITY PURVEYORS:

CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA EDISON
24-HOUR EMERGENCY: (800) 611-1911

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

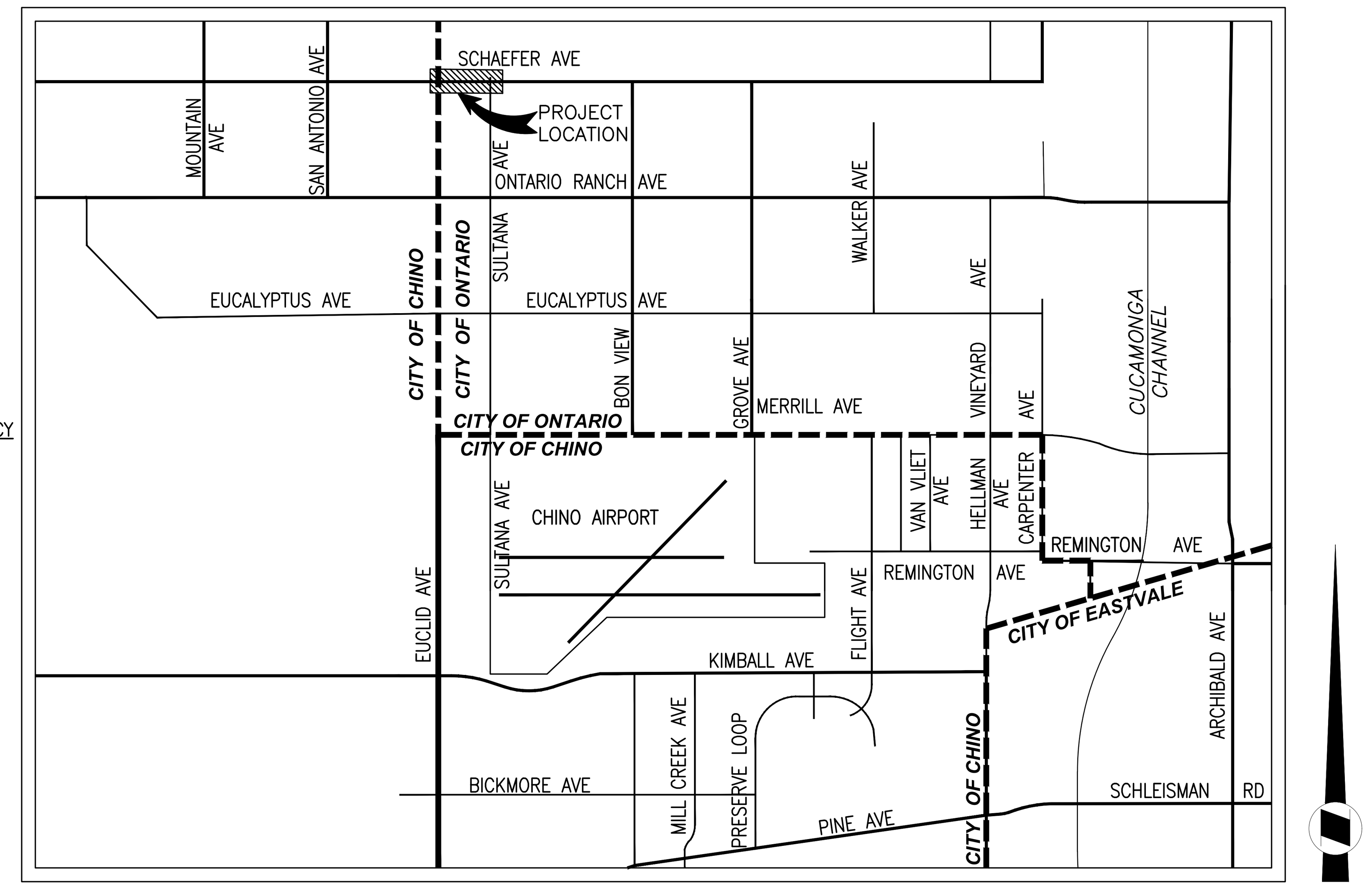
LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF ONTARIO IN THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOTS 1, 2, 3, 16, 17, 18, 20, 21 AND 35 OF SECTION 18, TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO BASE AND MERIDIAN, ACCORDING TO MAP OF SUBDIVISION OF PART OF RANCHO SANTA ANA DEL CHINO, AS PER PLAT RECORDED IN BOOK 6, PAGE 15, OF MAPS, RECORDS OF SAID COUNTY.

BASIS OF BEARING

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM (CCS83), ZONE 5, NORTH AMERICAN DATUM 1983 (NAD83) BASED LOCALLY ON CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) "LORS" AND "EWPP" (BASIS OF BEARINGS: S 81°29'26 E).



VICINITY MAP
N.T.S.

OWNER/DEVELOPER:

DISTINGUISHED HOMES

CONTACT: JASON LEE
PHONE: (14) 412-9263

CIVIL ENGINEER

WESTLAND GROUP INC.
4150 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SIARA R. MACKINNEY, P.E.
PHONE: (909)-403-5647

GEOTECHNICAL ENGINEER:

CONVERSE CONSULTANTS
2021 RANCHO DRIVE, SUITE 1
REDLANDS, CA 92373

CONTACT: HASHMI S. E. QUAZI
PHONE: (909) 796-0544

CONSTRUCTION NOTES

ITEM	DESCRIPTION	QUANTITY	
1	CONSTRUCT 90" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.	399	LF
2	CONSTRUCT 72" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.	1,010	LF
3	CONSTRUCT 48" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.	73	LF
4	CONSTRUCT 24" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.	92	LF
5	CONSTRUCT 18" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.	218	LF
6	CONSTRUCT CATCH BASIN NO.2 PER CITY OF ONTARIO STD. DWG. 3003. "W" AND "V" PER PLAN	2	EA
7	CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. 3005. REFER TO PERMIT PM 20714 STREET IMPROVEMENT PLANS FOR DETAILS.	2	EA
8	CONSTRUCT STORM DRAIN MANHOLE PER SPPWC STD. 320-2, DETAIL ON SHEET 8	4	EA
9	CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 331-3, DETAIL ON SHEET 8	2	EA
10	CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 10 ON SHEET 7	1	EA
11	CONSTRUCT 36" TEMPORARY CSP STANDPIPE (14 GUAGE) PER DETAIL 11 ON SHEET 6	5	EA
12	CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 7	2	EA
13	INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 13 ON SHEET 7	2	EA
14	CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE PER DETAIL 14 ON SHEET 7	2	EA
15	INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO OCEAN" OR EQUIVALENT	2	EA
16	CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2 PER DETAIL ON SHEET 8	2	EA
17	CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 332-2, CASE 1, DETAIL ON SHEET 7	5	EA
18	REMOVE BRICK AND MORTAR PLUG	1	EA
19	CONSTRUCT 12" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.	184	LF

INDEX OF DRAWINGS

REFERENCE DRAWINGS

DESCRIPTION	REFERENCE
PROPOSED 8" RECYCLED WATER AT SCHAEFER AVE	PM 20714 RECYCLED WATER IMPROVEMENT
PROPOSED 12" DOMESTIC WATER AT SCHAEFER AVE	PM 20714 DOMESTIC WATER IMPROVEMENT PLAN
PROPOSED 90" STORM DRAIN AT EUCLID AVE	PM 20714 STORM DRAIN IMPROVEMENT PLAN
EXISTING 16" & 18" DOMESTIC WATER AT SCHAEFER AVE	CB 1860-1863 WATER IMPROVEMENT PLAN

HYDROLOGY LEGEND

Q_{ULT-O} = PEAK FLOW RATE BASED ON THE CITY OF ONTARIO MPD
NOTE:
THE CITY OF ONTARIO: $Q_{ULT-O}=234.50\ FT^3/S$
$Q_{ULT-O}=121.20\ FT^3/S$
$Q_{ULT-O}=34.50\ FT^3/S$

$Q_{INTERIM}$ = PEAK FLOW RATE BASED ON CURRENT LAND COVER.

NOTE:
THE CITY OF ONTARIO: $Q_{INTERIM}=94.38\ FT^3/S$
$Q_{INTERIM}=48.78\ FT^3/S$
$Q_{INTERIM}=13.89\ FT^3/S$

H_{ULT-O} BASED ON CITY OF ONTARIO Q_{ULT}

$V_{ULT-100}$ = FOUND USING $Q_{ULT-100}$.
$V_{INT-100}$ = FOUND USING $Q_{INT-100}$.

LEGEND OF ABBREVIATIONS

BC	BEGIN CURVE	LT	LEFT
BCR	BEGIN CURB RETURN	LP	LOW POINT
BNDY	BOUNDARY	MIN	MINIMUM
C+G	CURB AND GUTTER	PCC	POINT OF COMPOUND CURVE
CB	CATCH BASIN	ℙ OR P/L OR PL	PROPERTY LINE
CFS	CUBIC FEET PER SECOND	PRC	POINT OF REVERSE CURVE
℄ OR C/L OR CL	CENTERLINE	PVC	POLYVINYL CHLORIDE
DBL	DOUBLE	RCB	REINFORCED CONCRETE BOX
DW	DOMESTIC WATER	RCP	REINFORCED CONCRETE PIPE
EC	END CURVE	RT	RIGHT
ECR	END CURB RETURN	RW	RECYCLED WATER
EP	EDGE OF PAVEMENT	R/W	RIGHT OF WAY
ESMT	EASEMENT	SD	STORM DRAIN
EX, EXIST.	EXISTING	SL	STREET LIGHT
FH	FIRE HYDRANT	SP	STAND PIPE (RCP)
FL	FLOW LINE	SS	SANITARY SEWER
FS	FINISHED SURFACE	SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
FT/S	FEET PER SECOND	STA	STATION
GB	GRADE BREAK	TC	TOP OF CURB
HDPE	HIGH DENSITY POLY ETHYLENE	TYP	TYPICAL
HP	HIGH POINT	ULT	ULTIMATE
INT	INTERIM		
INV	INVERT		

LEGEND OF SYMBOLS

(100)	EXISTING CONTOURS		PROPOSED STORM DRAIN MH
100	PROP. CONTOUR		PROPOSED CATCH BASIN
	EXIST. EASEMENT		PROPOSED STORM DRAIN
2%	FLOW RATE		BOUNDARY LINE
	CENTERLINE		FENCE LINE
	FIRE HYDRANT		STREET LIGHT
	SIGN		

CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.
2. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY AND NOT BE LIMITED TO A NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER, OR ANY PUBLIC AGENCY.
3. THE ESTIMATES OF IMPROVEMENT QUANTITIES AS SHOWN HEREON ARE PROVIDED ONLY FOR THE PURPOSE OF SATISFYING DISTRICT PLAN INFORMATION REQUIREMENTS. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES AND SHALL USE SAME AS A BASIS FOR HIS BID(S) AND CONTRACT(S).
4. CONTRACTOR TO VERIFY CLEARANCE AT ALL UTILITY CROSSINGS. IF INTERFERENCE OCCURS, OTHER THAN NOTED ON PLAN, CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR POSSIBLE REDESIGN. IF REDESIGN IS NOT FEASIBLE, CONTRACTOR TO RELOCATE UTILITY AT NO EXPENSE TO ENGINEER.
5. CONTRACTOR SHALL TAKE EXTREME CARE DURING STORM DRAIN CONSTRUCTION AND IS RESPONSIBLE FOR TRENCHING AND SHORING. CONTRACTOR SHALL SUBMIT A DETAILED SHORING PLAN PER SECTION 7-10.4.2.2 OF SPPWC AND A PERMIT FROM STATE DIVISION OF INDUSTRIAL SAFETY PRIOR TO COMMENCING WORK.
6. CONTRACTOR SHALL VERIFY PAVEMENT ELEVATION AT RIM PRIOR TO SETTING CONE.

811
Know what's below.
Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE

TECK, C. LOH, P.E.
HARRIS AND ASSOCIATES

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: WLG
DATE: 5/31/2023
DRAWN BY: WLG
DATE: 5/31/2023
CHECKED BY:
DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. CC-18-1
ELEV. 688.825' (NAVD '88) LEVEL RUN 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO CC-18-1." SET ON MOC OF THE HCR CURB @ THE SOUTHEAST RETURN OF EDISON AVE. AND EUCLID AVE.

REGISTERED PROFESSIONAL ENGINEER
SIARA ROSE MACKINNEY
No.85559
Exp. 9/30/2024
CIVIL
STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 (R.C.E. NO.) 5/31/2023 (DATE)

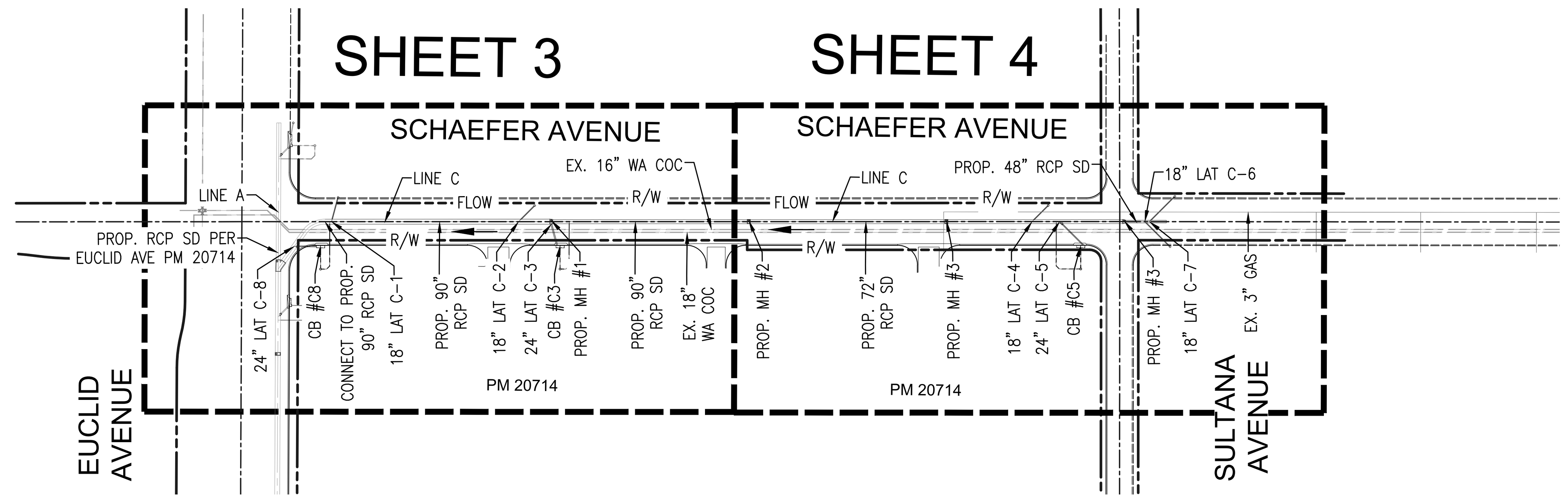
STORM DRAIN IMPROVEMENT PLAN (PUBLIC)
SCHAEFER AVENUE
TITLE SHEET

PM-20714

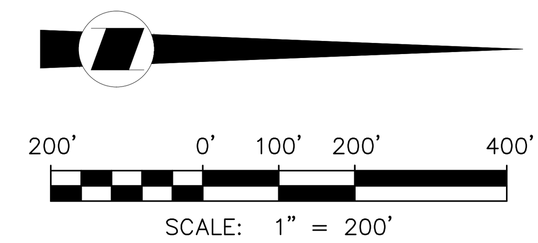
SHEET 1 OF 8
CONTRACT
ACCOUNT
DWG. NO.

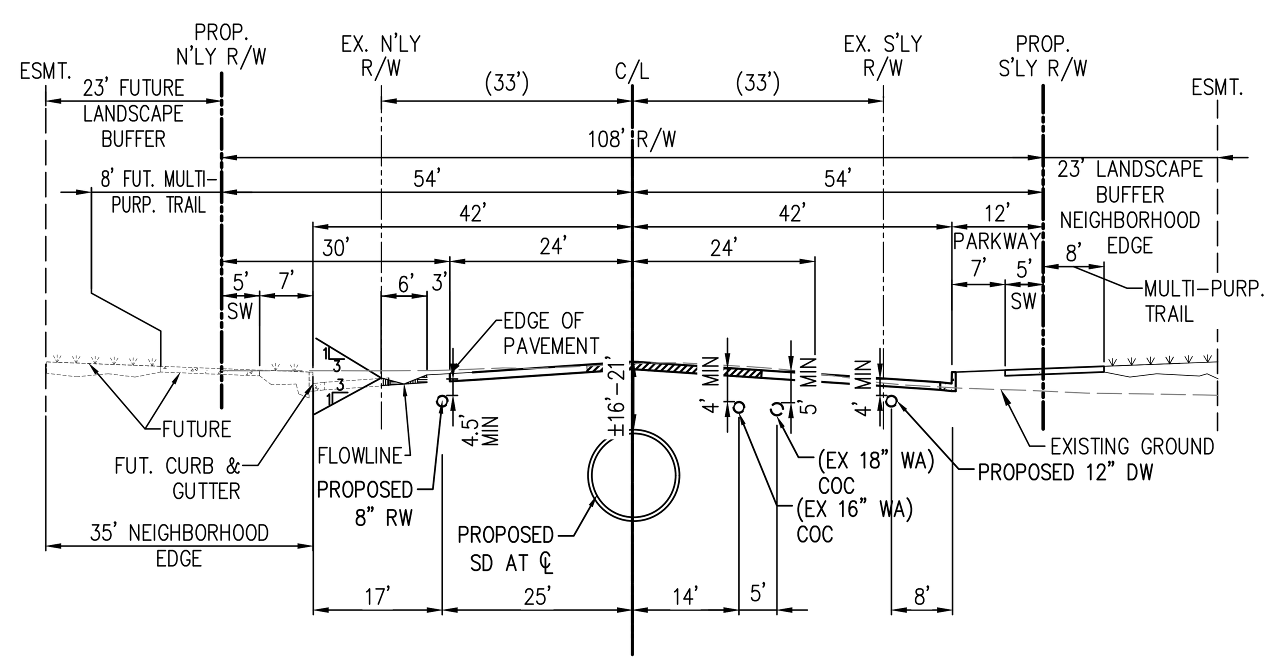
Drawing Name: Z:\Shared\Project\Year_2022\2022-294 EMUSP - Distinguished Homes - Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\01_2022-294_SD.dwg
Last Opened: May 31, 2023 - 1:04pm by: Jose

05/31/2023



SHEET INDEX/SYSTEM MAP





TYPICAL UTILITY SECTION
SCHAEFER AVENUE
STA 16+47.17 TO STA 31+37.70
STREET STATIONING
N.T.S.

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: WLG
DATE: 5/31/2023
DRAWN BY: WLG
DATE: 5/31/2023
CHECKED BY:
DATE:

CITY OF ONTARIO

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REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No.85559 — Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 5/31/2023 DATE

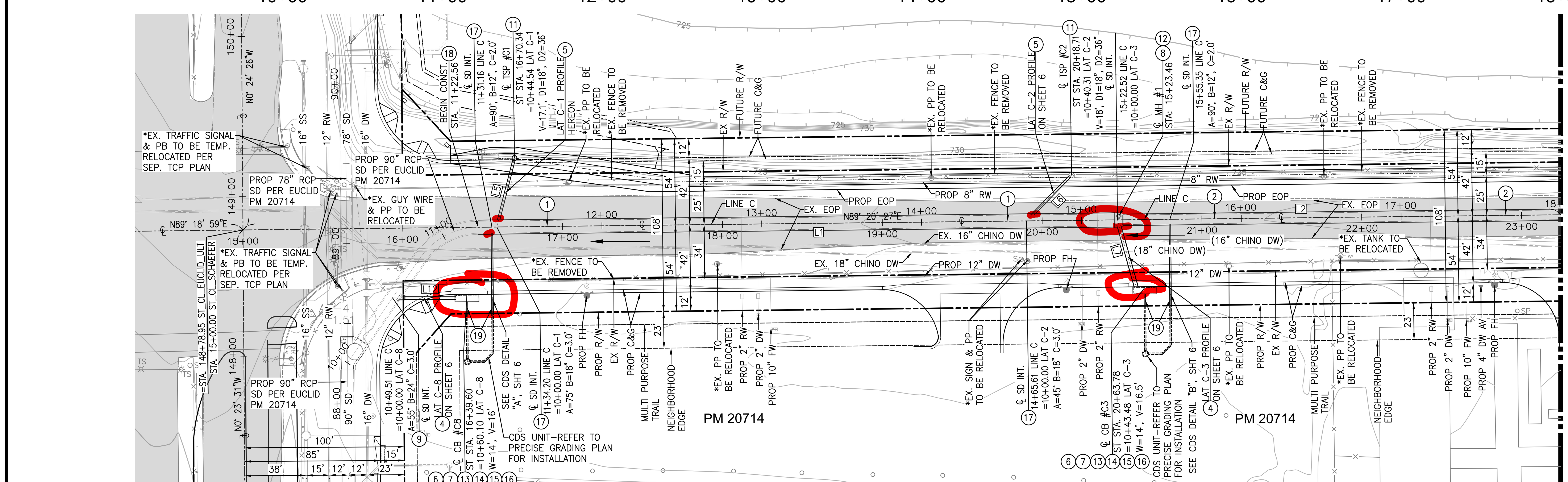
STORM DRAIN IMPROVEMENT PLAN (PUBLIC)
SCHAEFER AVENUE
SHEET INDEX AND TYPICAL SECTIONS

PM-20714

SHEET 2 OF 8
CONTRACT
ACCOUNT
DWG. NO.

05/31/2023

Drawing Name: Z:\Shared\Project\Year_2022\2022-294 EMUSP - Distinguished Homes - Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\02_2022_294_SD-USM.dwg
Last Opened: May 31, 2023 - 1:04pm by: Jose



CONSTRUCTION NOTES

1. CONSTRUCT 90" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.
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18. REMOVE BRICK AND MORTAR PLUG

STORM DRAIN CENTERLINE DATA TABLE

LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L1	N89°20'27"E	398.55'		
L2	N89°20'27"E	274.23'		
L5	N14°20'27"E	40.66'		
L6	N44°20'27"E	35.00'		
L7	S15°39'26"E	38.88'		
L12	N90°00'00"E	31.99'		

EUCLID AVENUE
(SR-83)

SCHAEFER AVENUE
(PUBLIC)

LEGEND

EXISTING PAVEMENT

STORM DRAIN FLOW DIRECTION

NOTE:

* IMPROVEMENTS PER SEPARATE CONTRACT
  - CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
  - NO CONSTRUCTION SHALL BE ALLOWED ON CALTRANS R/W WITHOUT AN ENCROACHMENT PERMIT FROM CALTRANS

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: WLG
DATE: 5/31/2023
DRAWN BY: WLG
DATE: 5/31/2023
CHECKED BY:
DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER DATE

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REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 5/31/2023 DATE

STORM DRAIN IMPROVEMENT PLAN (PUBLIC)

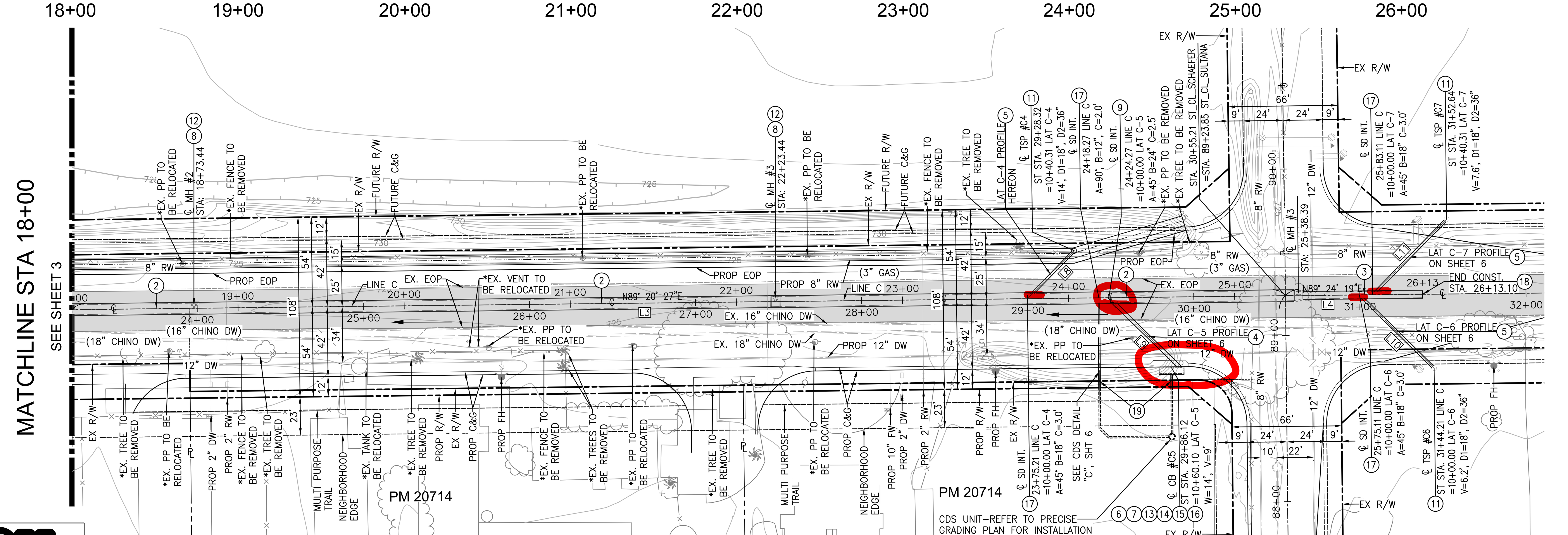
SCHAEFER AVENUE
SCHAEFER AVENUE - FROM EUCLID AVE TO 825' EAST OF EUCLID AVE

PM-20714

SHEET 3 OF 8
CONTRACT
ACCOUNT
DWG. NO.

05/31/2023

Drawing Name: Z:\Shared\Project\Year_2022\2022-294 EMUSP - Distinguished Homes - Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\03-05_2022-294_SD.dwg Last Opened: May 31, 2023 - 1:06pm by: Jose



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LINE/CURVE	BEARING/DELTA	LENGTH	RADIUS	TAN
L3	N89°20'27"E	736.05'		
L4	N89°24'19"E	72.38'		
L8	N44°20'27"E	36.06'		
L9	S45°39'33"E	53.34'		
L10	S45°35'41"E	60.10'		
L11	N44°24'19"E	60.71'		

SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

NOTE:

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LEGEND

EXISTING PAVEMENT

STORM DRAIN FLOW DIRECTION

SCHAEFER AVENUE
(PUBLIC)

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: WLG
DATE: 5/31/2023
DRAWN BY: WLG
DATE: 5/31/2023
CHECKED BY:
DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. CC-18-1
ELEV. 688.825' (NAVD '88) LEVEL RUN 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO CC-18-1." SET ON MOC OF THE HCR CURB @ THE SOUTHEAST RETURN OF EDISON AVE. AND EUCLID AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 5/31/2023

STORM DRAIN IMPROVEMENT PLAN (PUBLIC)

SCHAEFER AVENUE
SCHAEFER AVENUE - FROM 825' EAST OF EUCLID AVE TO SULTANA AVE

PM-20714

CONTRACT
ACCOUNT
DWG. NO.

05/31/2023

10+00 10+50

LATERAL C-2

SEE PLAN VIEW SHEET 3

10+00 10+50

LATERAL C-3

SEE PLAN VIEW SHEET 3

10+00 10+50

LATERAL C-5

SEE PLAN VIEW SHEET 4

10+00 10+50

LATERAL C-6

SEE PLAN VIEW SHEET 4

10+00 10+50

LATERAL C-7

SEE PLAN VIEW SHEET 4

10+00 10+50

LATERAL C-8

SEE PLAN VIEW SHEET 3

811 Know what's below. Call 811 before you dig.

40' 0' 20' 40' 80'

SCALE: 1" = 40'

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: WLG
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DRAWN BY: WLG
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STORM DRAIN IMPROVEMENT PLAN (PUBLIC)

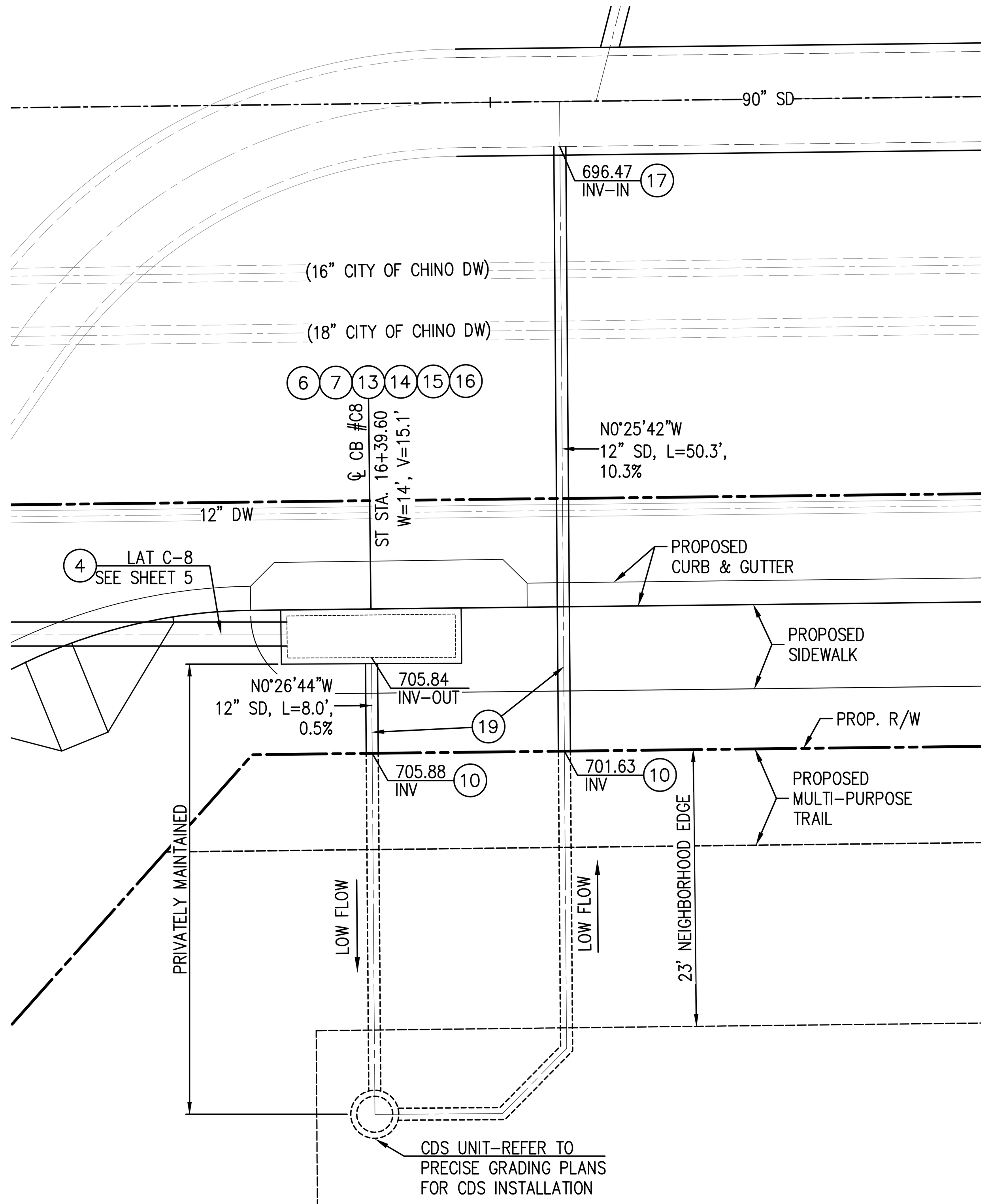
SCHAEFER AVENUE
SCHAEFER AVENUE - FROM 825' EAST OF EUCLID AVE TO SULTANA AVE

PM-20714

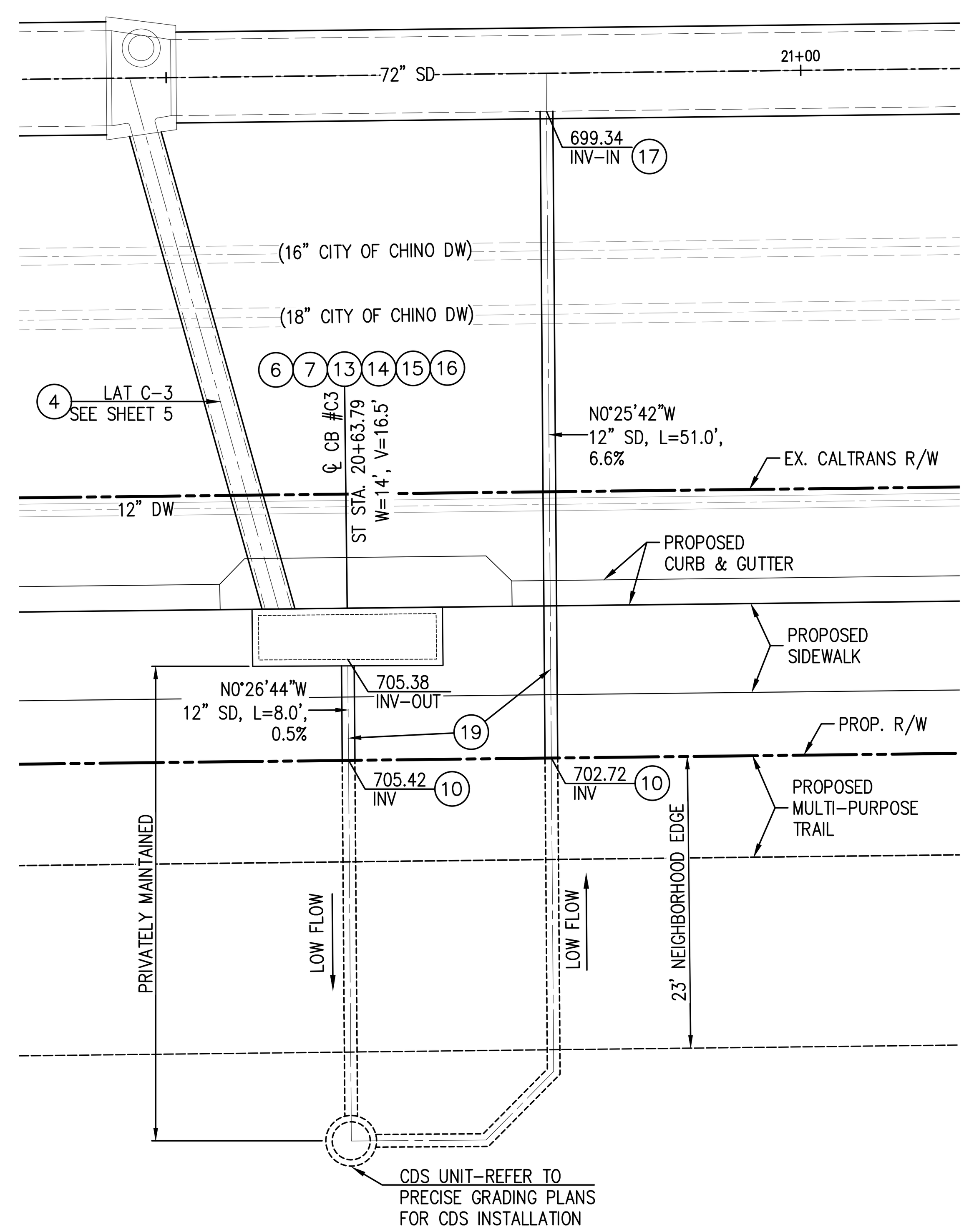
SHEET 5 OF 8
CONTRACT
ACCOUNT
DWG. NO.

05/31/2023

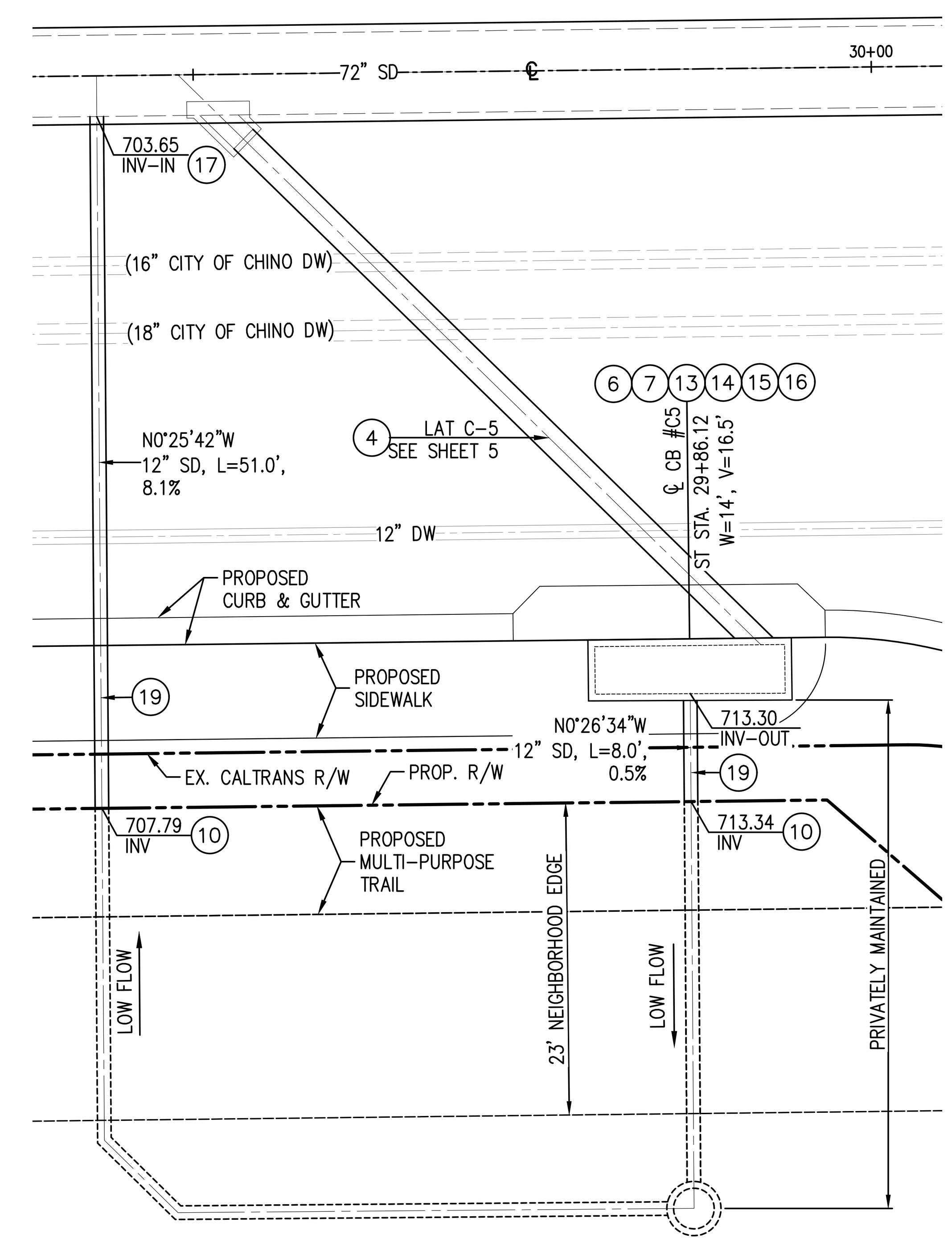
Drawing Name: Z:\Shared\Project\Year_2022\2022-294 EMJSP - Distinguished Homes - Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\03-05_2022-294_SD.dwg
Last Opened: May 31, 2023 - 1:06pm by: Jose



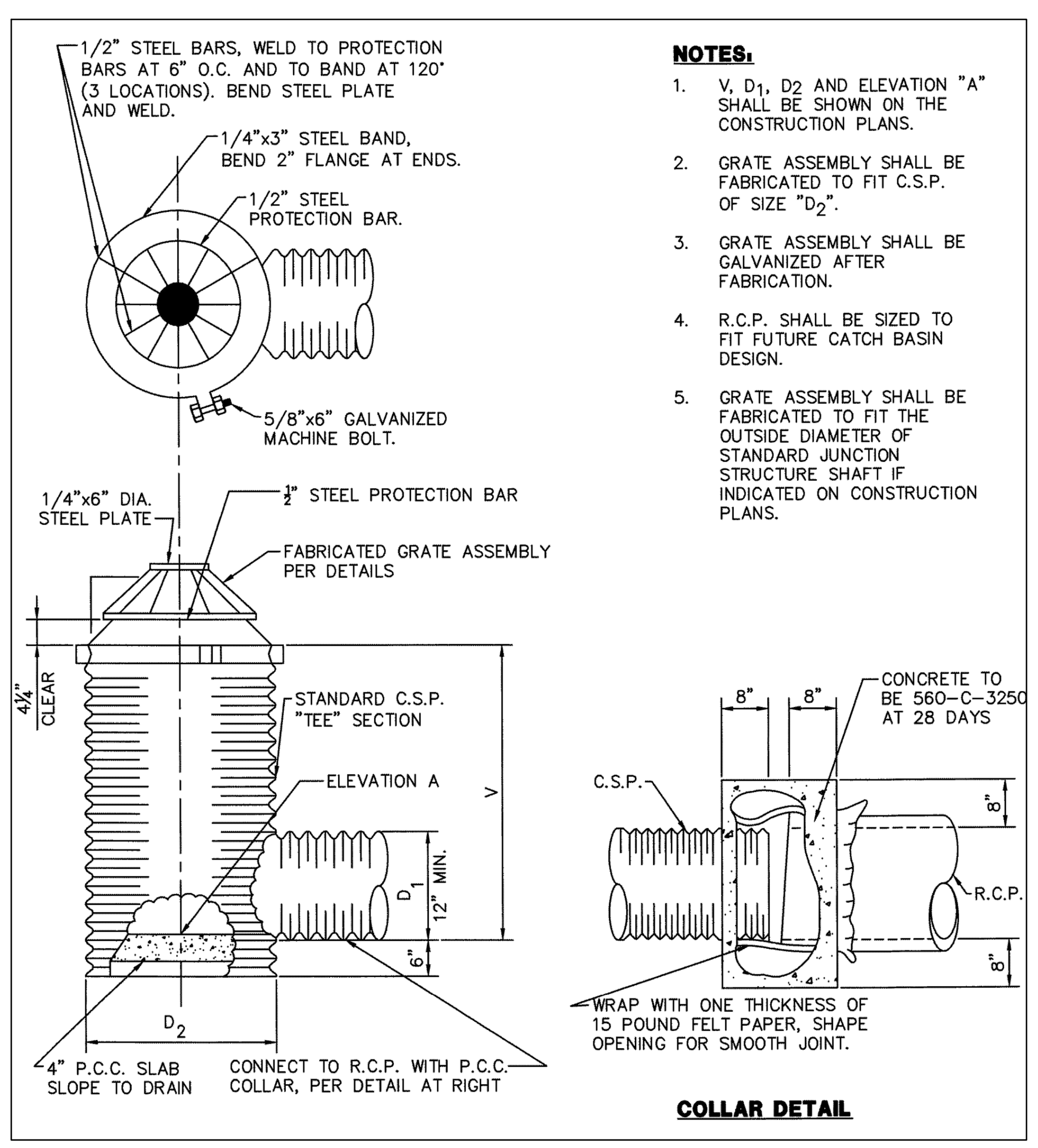
CDS DETAIL "A"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 3



CDS DETAIL "B"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 3



CDS DETAIL "C"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 4



(11) TEMPORARY CSP STANDPIPE DETAIL

CONSTRUCTION NOTES

(4) CONSTRUCT 24" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.

(6) CONSTRUCT CATCH BASIN NO.2 PER CITY OF ONTARIO STD. DWG. 3003. "W" AND "V" PER PLAN

(7) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. 3005. REFER TO PERMIT PM 20714 STREET IMPROVEMENT PLANS FOR DETAILS.

(10) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 10 ON SHEET 7

(13) INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 13 ON SHEET 7

(14) CONSTRUCT BIO CLEAN CONNECTOR PIPE SCREEN ON 12" PIPE PER DETAIL 14 ON SHEET 7

(15) INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO OCEAN" OR EQUIVALENT

(16) CONSTRUCT MONOLITHIC CATCH BASIN CONNECTION PER SPPWC 308-2 PER DETAIL ON SHEET 8

(17) CONSTRUCT JUNCTION STRUCTURE PIPE TO PIPE PER SPPWC STD. 332-2, CASE 1, DETAIL ON SHEET 7

(19) CONSTRUCT 12" RCP. TRENCH EXCAVATION & BACKFILL PER CITY OF ONTARIO STD. DRW. NO. 1306. D-LOAD PER PLAN. BEDDING PER LACDPW STD. 3080-3 OR APPROVED EQUAL.

NOTE:

- CDS UNITS AND 12" RCP WILL BE PRIVATELY MAINTAINED BY ON SITE PROPERTY OWNER PER WQMP MANAGEMENT AGREEMENT
- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT, AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

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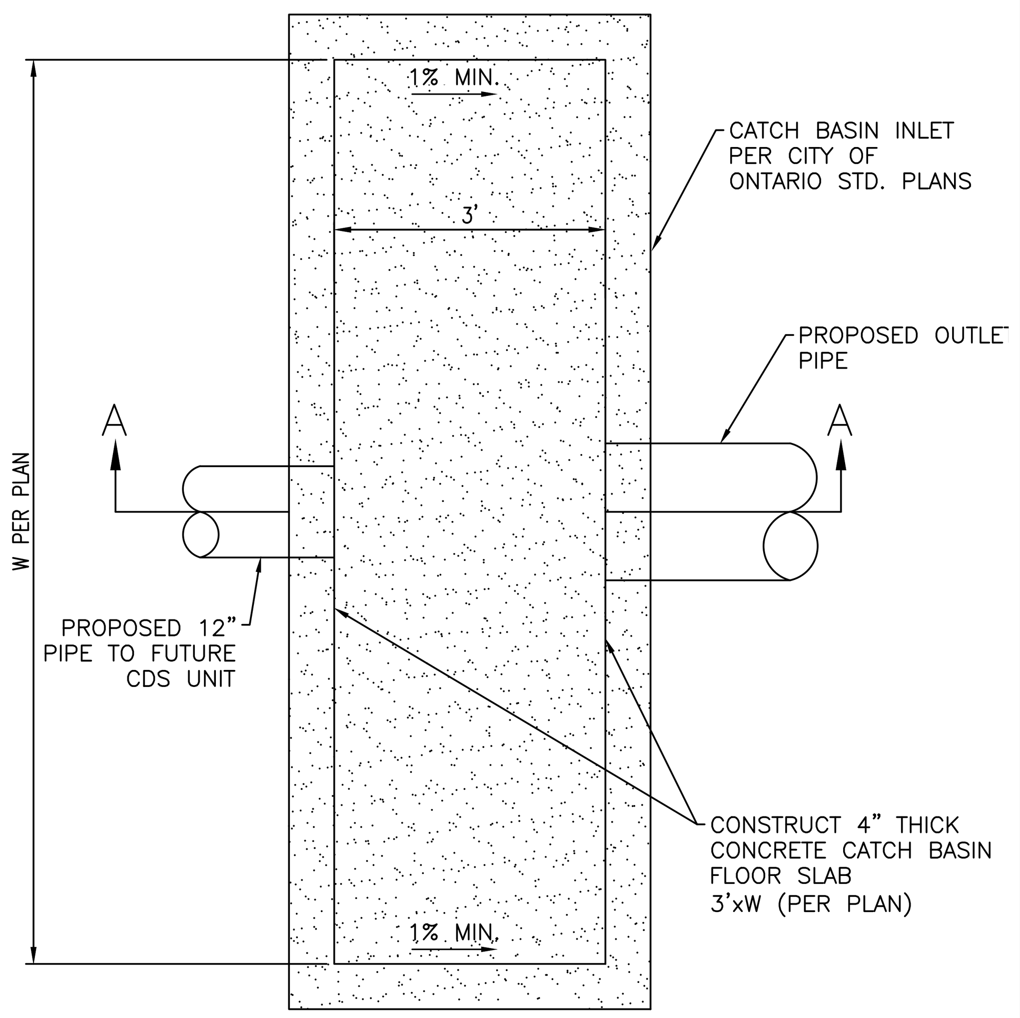
STORM DRAIN IMPROVEMENT PLAN (PUBLIC)
SCHAEFER AVENUE
CDS DETAILS

PM-20714

SHEET 6 OF 8
CONTRACT
ACCOUNT
DWG. NO.

05/31/2023

Drawing Name: Z:\Shared\Project Year_2022\2022-294 EMJSP - Distinguished Homes - Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\06_2022-294_SD.dwg Last Opened: May 31, 2023 - 1:08pm by: Jose

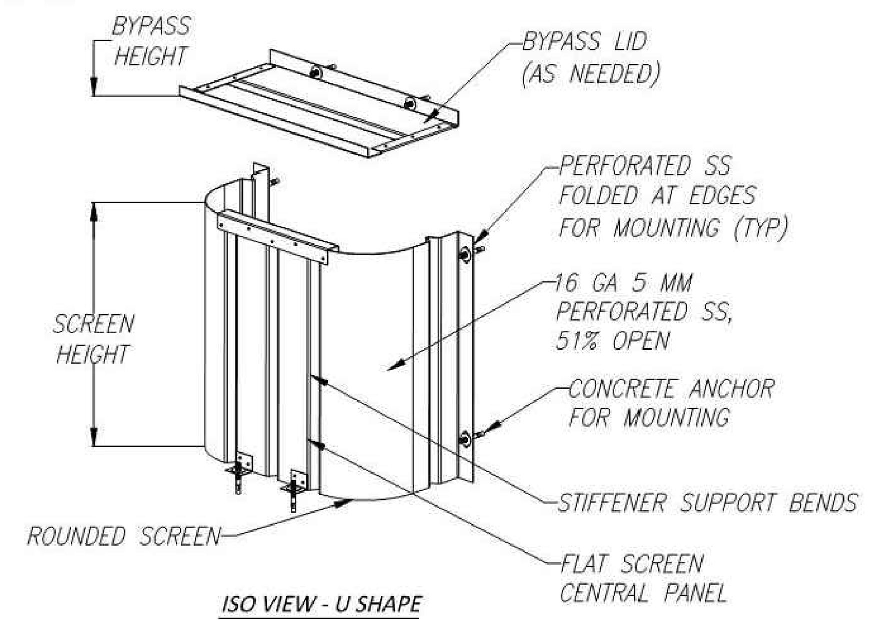


CATCH BASIN - PLAN VIEW

13 CATCH BASIN - TEMPORARY FLOOR CONSTRUCTION DETAIL

N.T.S.

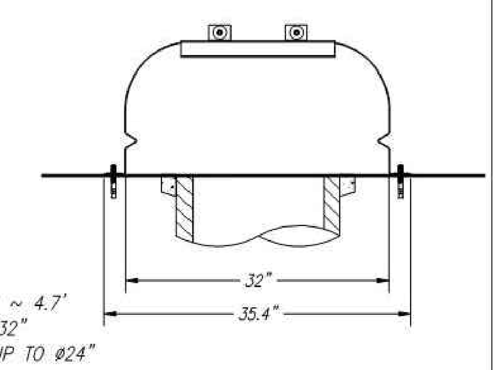
CONNECTOR PIPE SCREEN (CPS) U 4.7



ISO VIEW - U SHAPE

CPS U WITH 4.7 FT SCREEN LENGTH	
CPS HEIGHT (IN)	SCREEN FLOW (CFS)
12	6.67
18	12.26
24	18.88
30	26.40
36	34.71

NOTE: BYPASS FLOW RATES VARY WITH VAULT DEPTH AND BYPASS HEIGHT. CONTACT BIO CLEAN FOR ADDITIONAL INFORMATION.



TOTAL SCREEN LENGTH ~ 4.7'
SPAN LENGTH = 32"
COMPATIBLE WITH PIPES UP TO ø24"

TOP SECTION VIEW - U SHAPE

GENERAL NOTES

1. BIO CLEAN TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS, AND CAPACITIES ARE SUBJECT TO CHANGE.
3. THIS CPS UNIT IS DESIGNED FOR TREATMENT FLOWS THROUGH THE SCREEN. FLOWS GREATER THAN THE TREATMENT FLOW RATE WILL BYPASS OVER THE SCREEN.
4. A BYPASS LID IS REQUIRED WHEN THE OUTLET PIPE IS DIRECTLY BELOW THE CURB OPENING.
5. CPS IS COMPRISED OF 304 STAINLESS STEEL. THICKNESS IS 16 GAUGE. SCREEN PERFORATIONS ARE 5 MILLIMETERS IN DIAMETER. THE SCREEN AREA IS 51% OPEN SPACE.

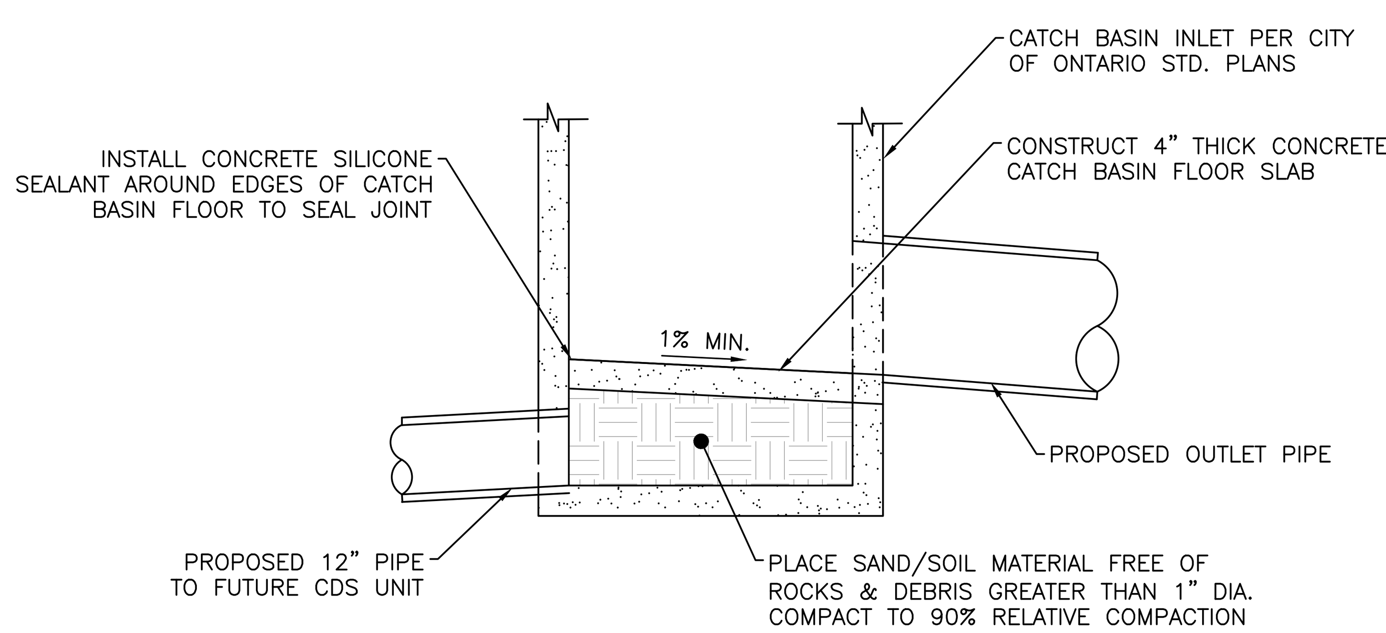
INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS REQUIRED TO INSTALL THE CPS UNIT AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. POSITION THE CPS SO IT IS EVENLY SPACED AROUND THE CONNECTOR PIPE, ENSURING A MIN. OF 4" SPACING AWAY FROM ANY CORNERS. SCREEN BOTTOM SHALL BE FLUSH WITH THE CATCH BASIN FLOOR, OR WITH GAPS NO GREATER THAN 5 MM.
3. IF A BYPASS LID IS REQUIRED, VERIFY THE BYPASS HEIGHT NEEDED AND MARK THAT LOCATION ON THE WALL DIRECTLY ABOVE THE BASE UPRIGHTS. LIFT THE LID IN PLACE AND MARK THE HOLE LOCATIONS FOR THE LID MOUNTING BRACKETS. SECURE THE LID WITH STAINLESS STEEL NUTS.

WARRANTY: 3 YEAR MANUFACTURER'S		MEETS FULL CAPTURE REQUIREMENTS	
BIO CLEAN ENVIRONMENTAL SERVICES, INC. 398 VIA EL CENTRO, OCEANSIDE CA 92058 PHONE: 760-433-7640		REVISIONS:	DATE:
		REVISIONS:	DATE:
DATE: 1/17/2020	SCALE: NTS	REVISIONS:	DATE:
DRAFTER: G.M.S.	UNITS = INCHES	REVISIONS:	DATE:

Bio Clean
A Forterra Company

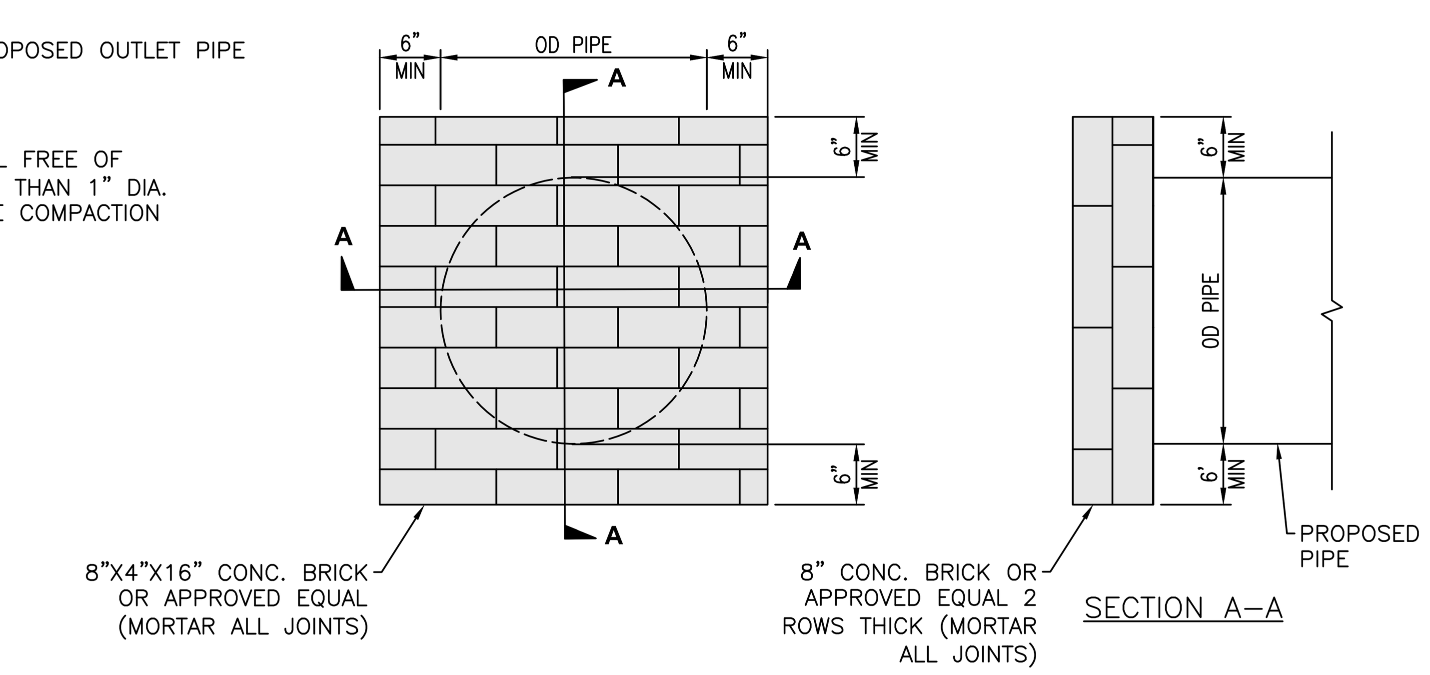
14 BIO CLEAN CONNECTOR PIPE SCREEN DETAIL



CATCH BASIN - PROFILE VIEW
SECTION A-A

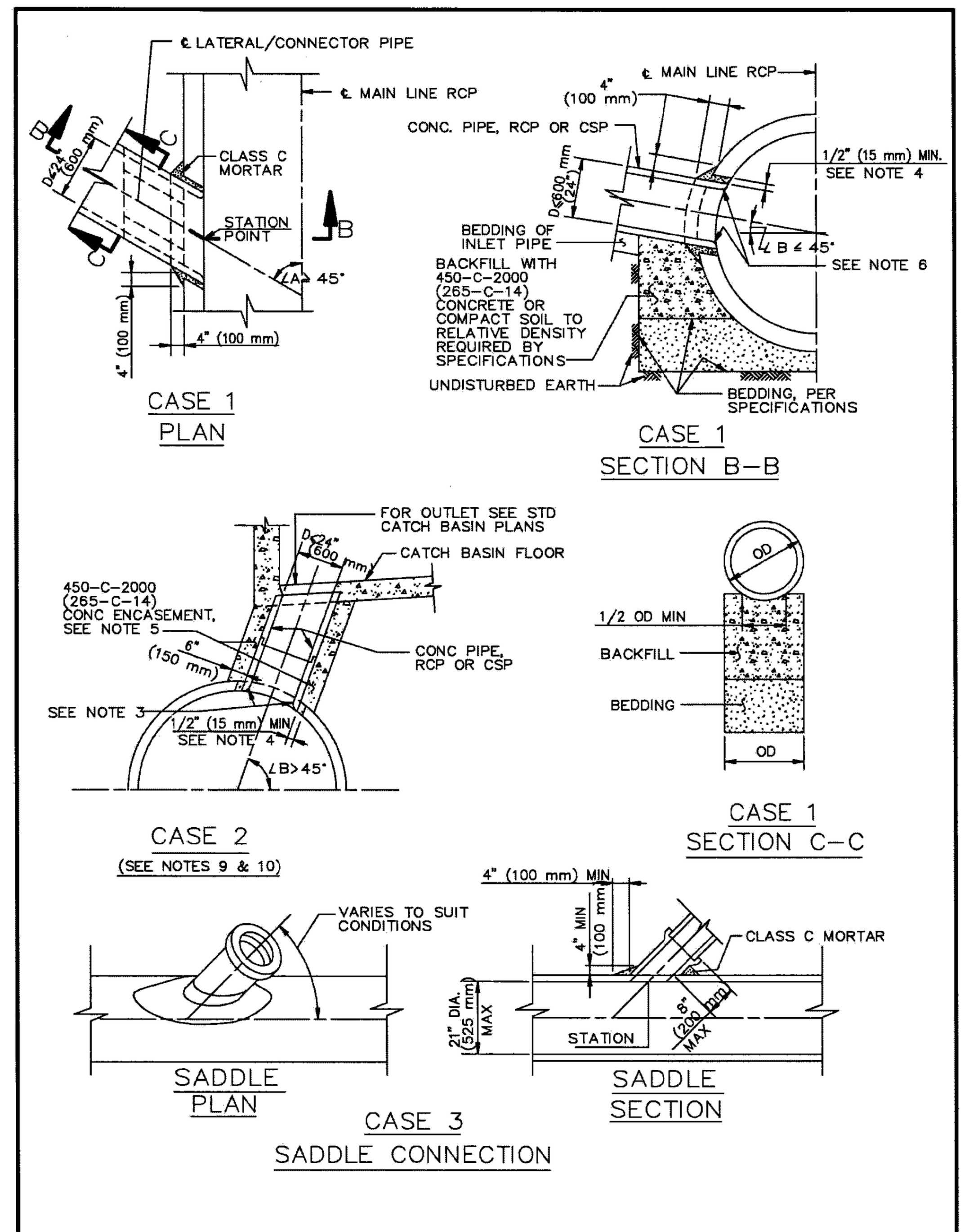
NOTE:

WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED



10 BRICK AND MORTAR BULKHEAD DETAIL

N.T.S.



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009	JUNCTION STRUCTURE – PIPE TO PIPE ID ≤ 24" (600 mm)	STANDARD PLAN 332–2
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2

NOTES

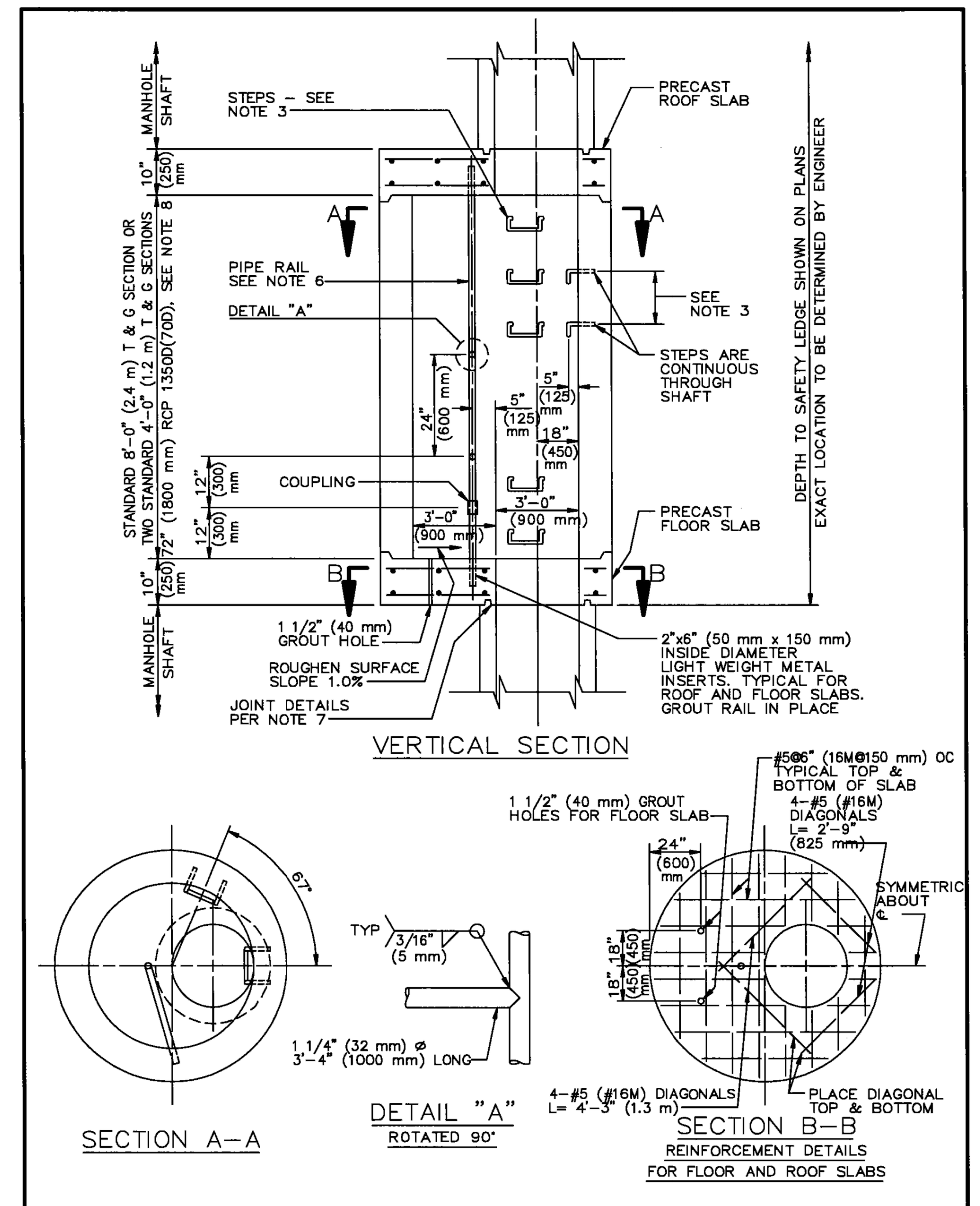
CASE 1 AND CASE 2

1. IF ANGLE A IS LESS THAN 45 OR IF D IS LARGER THAN 24" (600 mm), THEN ANOTHER STANDARD STRUCTURE SHALL BE SPECIFIED.
2. THE OUTSIDE DIAMETER OF THE INLET PIPE SHALL NOT EXCEED 1/2 THE INSIDE DIAMETER OF THE MAIN LINE.
3. THE INLET PIPE SHALL ENTER THE MAIN LINE RADIALLY. IF THE INLET PIPE CANNOT ENTER RADIALLY, THEN ANOTHER STANDARD STRUCTURE SHALL BE SPECIFIED.
4. THE SIZE OF THE OPENING INTO THE MAIN LINE SHALL BE THE OUTSIDE DIAMETER OF THE INLET PIPE PLUS 1" (30 mm) MINIMUM TO 3" (75 mm) MAXIMUM.
5. ALL CONNECTOR PIPES FOR CASE 2 SHALL BE ENCASED IN CONCRETE IF LAID WITHIN THE MAIN LINE EXCAVATED TRENCH OR IF LAID ON FILL WHICH HAS NOT BEEN DENSIFIED.
6. BURN OR CHIP END OF CONNECTOR PIPE FLUSH WITH INNER SURFACE OF MAIN LINE. ROUND EDGE OF CONCRETE PIPE OR RCP.
7. ALL CSP AND FITTINGS SHALL BE GALVANIZED.
8. STATION SPECIFIED ON THE PLANS APPLIES AT THE INTERSECTION OF THE INSIDE WALL OF MAIN LINE AND THE CENTERLINE OF INLET PIPE.
9. CASE 2 SHALL NOT BE USED TO CONNECT TO THE FLOOR OF A GRATING CATCH BASIN WHERE THE GRATE WILL BE SUBJECT TO VEHICLE TRAFFIC.
10. FOR CASE 2, NOT MORE THAN 12' (3.5 m) OF INLET PIPE SHALL BE LOCATED WITHIN THE MAIN LINE EXCAVATED TRENCH.

CASE 3

11. CONNECTIONS TO PIPES 21" (525 mm) OR LESS IN DIAMETER WITHOUT JUNCTION STRUCTURES OR PRECAST Y BRANCHES SHALL BE MADE WITH SADDLES.
12. THE OUTSIDE DIAMETER OF THE INLET PIPE SHALL NOT EXCEED ONE-HALF THE INSIDE DIAMETER OF THE MAIN LINE.
13. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN LINE SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTOR PIPE.
14. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
15. THE CONNECTOR PIPE SHALL BE SUPPORTED AS SHOWN IN CASES 1 AND 2.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
JUNCTION STRUCTURE – PIPE TO PIPE (ID ≤ 24" (600 mm))	332–2 SHEET 2 OF 2



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009	MANHOLE SHAFT SAFETY LEDGE	STANDARD PLAN 330–2
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2

NOTES

1. MANHOLE SHAFT SAFETY LEDGE WILL BE NOTED ON THE PLANS WHEN REQUIRED. IT IS TO BE CONSTRUCTED WHEN DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
2. A SAFETY LEDGE SHALL NOT BE USED IF A PRESSURE MANHOLE IS REQUIRED.
3. STEPS SHALL CONFORM TO SPPWC 635 OR 636 AND SHALL BE ANCHORED 4" (100 mm) IN THE WALL OF THE STRUCTURE. STEPS SHALL BE PLACED TO MATCH THE SPACING OF THE MANHOLE SHAFT.
4. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300) AND SHALL TERMINATE 2" (50 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
5. GROUT HOLES, PIPE AND FITTINGS SHALL BE PROVIDED IN THE FLOOR SLAB. PRESSURE GROUTING SHALL BE USED TO FILL VOIDS AND TO SECURE UNIFORM BEARING. THE GROUT SHALL BE NEAT CEMENT GROUT AND GROUTING PRESSURES SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
6. PIPE RAIL SHALL BE FABRICATED OF 1 1/4" (32 mm) STANDARD GALVANIZED PIPE COMPOSED OF TWO SECTIONS 7'-6" (2.25 m) & 18" (450 mm) IN LENGTH JOINED BY A GALVANIZED COUPLING. THE COUPLING SHALL BE THREADED A MINIMUM OF 2" (50 mm) ON EACH PIPE LENGTH.
7. ROOF AND FLOOR SLABS SHALL BE PRECAST AND KEYED FOR REINFORCED CONCRETE PIPE SECTIONS AS SHOWN. ALL JOINTS SHALL BE FILLED WITH CLASS C MORTAR AND NEATLY POINTED OR WIPED ON THE INSIDE.
8. 72" (1800 mm) RCP SHALL BE PROVIDED WITH TWO CIRCULAR CAGES OF REINFORCEMENT.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
MANHOLE SHAFT SAFETY LEDGE	330–2 SHEET 2 OF 2

811 Know what's below. Call 811 before you dig.

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STORM DRAIN IMPROVEMENT PLAN (PUBLIC)

SCHAEFER AVENUE

DETAILS

PM-20714

SHEET 7 OF 8
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Drawing Name: Z:\Shared\Project Year_2022\2022-294 EMUSP – Distinguished Homes – Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\07_08_2022-294_SD_DET.dwg
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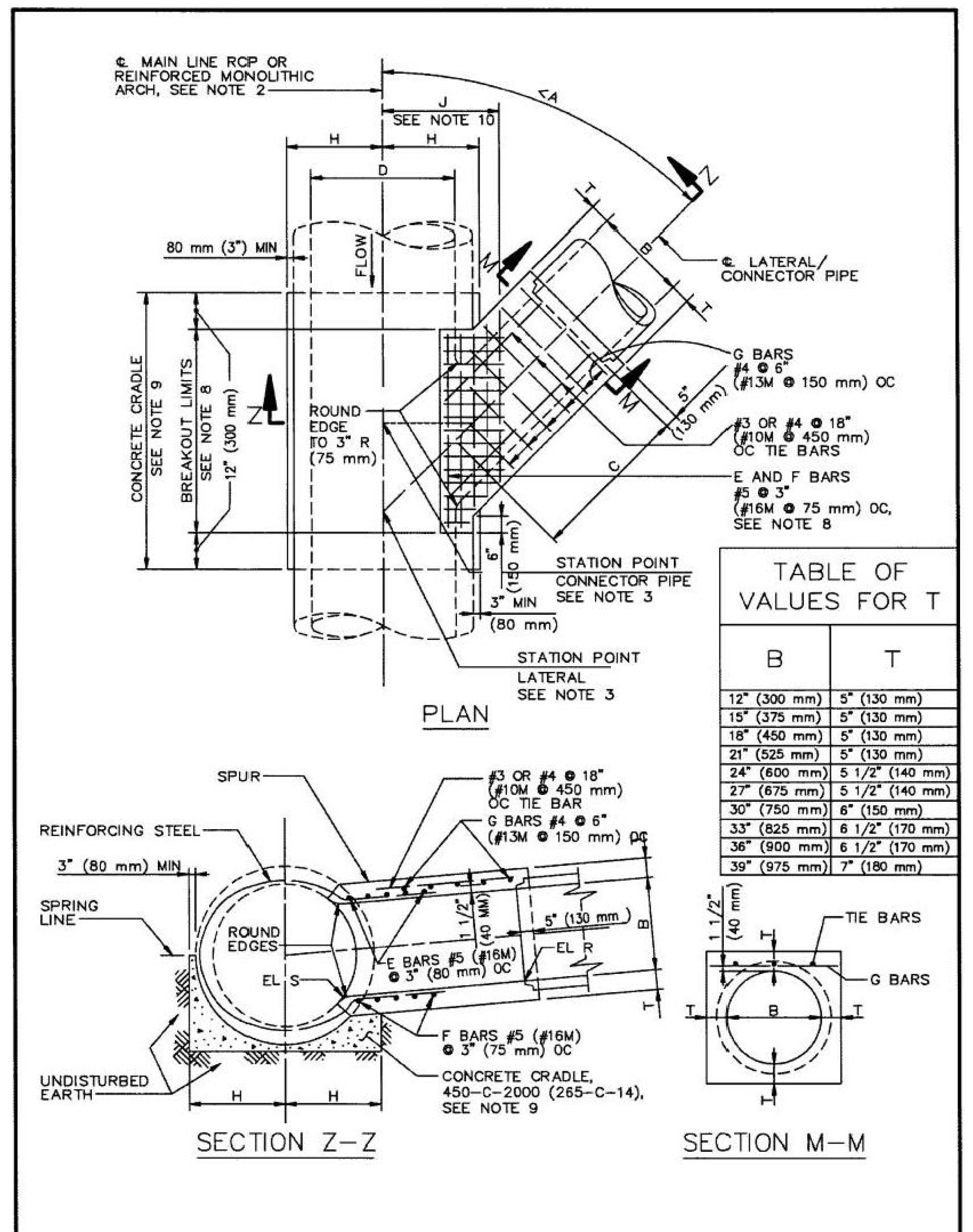


TABLE OF VALUES FOR T	
B	T
12" (300 mm)	5" (130 mm)
15" (375 mm)	5" (130 mm)
18" (450 mm)	5" (130 mm)
21" (525 mm)	5" (130 mm)
24" (600 mm)	5 1/2" (140 mm)
27" (675 mm)	5 1/2" (140 mm)
30" (750 mm)	6" (150 mm)
33" (825 mm)	6 1/2" (170 mm)
36" (900 mm)	6 1/2" (170 mm)
39" (975 mm)	7" (180 mm)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 1999, 2009

JUNCTION STRUCTURE–PIPE TO PIPE
INLET ID ≥ 24" (600 mm) OR OD > 1/2 MAIN LINE ID

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 331–3 SHEET 1 OF 2

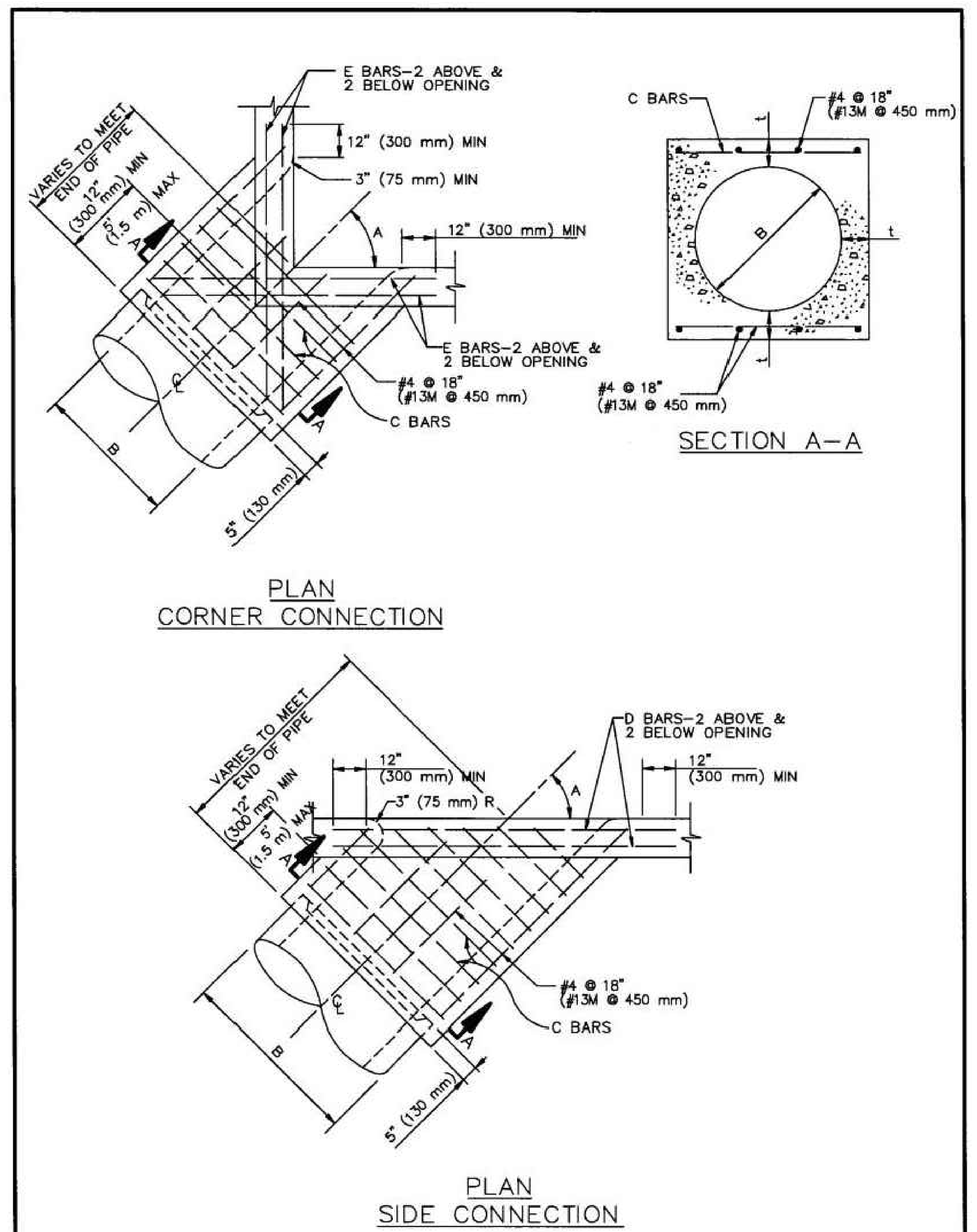
NOTES

1. THIS JUNCTION STRUCTURE SHALL BE USED WHEN THE OUTSIDE DIAMETER OF THE LATERAL IS GREATER THAN 1/2 THE INSIDE DIAMETER D OF THE MAIN LINE; OR WHEN THE INSIDE DIAMETER B OF THE LATERAL IS GREATER THAN 24" (600 mm). B SHALL NOT EXCEED 0.75 D OR 39" (975 mm).
2. IF THE MAIN LINE IS A REINFORCED MONOLITHIC ARCH STORM DRAIN, D SHALL REFER TO THE CLEAR SPAN OF THE ARCH. REINFORCING STEEL SHALL BE CUT AND BENT INTO THE JUNCTION STRUCTURE IN THE SAME MANNER AS FOR A PIPE. A CONCRETE CRADLE IS NOT REQUIRED FOR A REINFORCED MONOLITHIC ARCH.
3. STATIONS SHOWN ON THE PLANS FOR LATERALS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERAL. STATIONS SHOWN ON THE PLANS FOR CATCH BASIN CONNECTOR PIPES APPLY AT THE INTERSECTION OF THE INSIDE WALL OF THE MAIN LINE WITH THE CONNECTOR PIPE CENTERLINE.
4. VALUES FOR A, B, C AND D SHALL BE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S SHALL BE SHOWN ONLY WHEN REQUIRED PER NOTE 5.
5. a. ELEVATIONS R AND S NEED NOT BE SHOWN ON THE PLANS IF THE INLET PIPE IS TO ENTER THE MAIN LINE RADIALLY.
   b. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY IF A STUB IS TO BE PROVIDED IN THE MAIN LINE FOR FUTURE CONNECTION OF AN INLET PIPE.
   c. ELEVATION S SHALL BE SHOWN ON THE PLANS IF AN INLET PIPE IS TO ENTER THE MAIN LINE OTHER THAN RADIALLY. INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO THE CATCH BASIN OR GRADE BREAK IN LINE.
6. THE INLET PIPE SHALL ENTER THE MAIN LINE RADIALLY UNLESS OTHERWISE INDICATED. THE INLET PIPE MAY ENTER THE MAIN LINE OTHER THAN RADIALLY IF ANGLE A IS GREATER THAN 45°, B IS LESS THAN OR EQUAL TO 24" (600 mm) AND THE OUTSIDE DIAMETER OF THE INLET PIPE IS LESS THAN 0.5 D: OTHERWISE, SPPWC 340 SHALL BE USED.
7. NO MORE THAN ONE OPENING SHALL BE MADE IN ANY ONE SECTION OF PIPE.
8. THE OPENING FOR THE BREAKOUT SHALL BE RECTANGULAR AND CUT NORMAL TO THE PIPE SURFACE WITHOUT DAMAGING THE REINFORCING STEEL. THE TRANSVERSE REINFORCEMENT OF THE MAIN LINE SHALL BE CUT AT THE CENTER OF THE OPENING AND BENT INTO THE TOP AND BOTTOM SLABS OF THE SPUR.
9. THE MAIN LINE SHALL BE REINFORCED WITH A CONCRETE CRADLE AND ENCASEMENT (AS APPLICABLE). A CONCRETE ENCASEMENT IS REQUIRED IF A JOINT IN THE MAIN LINE FALLS WITHIN THE LIMITS OF THE CRADLE. THE CONCRETE ENCASEMENT SHALL EXTEND 12" (300 mm) ABOVE THE TOP OF THE MAIN LINE AND TO THE LIMITS OF THE CRADLE.
   IF CONNECTING TO AN EXISTING STORM DRAIN, PORTION OF CRADLE OPPOSITE INLET MAY BE OMITTED.
10. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, (ASTM A 615M, GRADE 300), AND BE PLACED 1 1/2" (40 mm) CLEAR FROM CONCRETE SURFACES, UNLESS OTHERWISE SHOWN F BARS SHALL BE CARRIED TO A POINT NOT LESS THAN J DISTANCE FROM CENTER LINE WITH J=7D/12 + 6" (150 mm).
11. FLOOR OF THE SPUR SHALL BE STEEL–TROWELED TO THE SPRING LINE OF THE SPUR.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

JUNCTION STRUCTURE–PIPE TO PIPE
INLET ID≥24" (600 mm) OR OD>1/2 MAIN LINE ID

STANDARD PLAN 331–3 SHEET 2 OF 2



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC., GREENBOOK COMMITTEE 1984 REV. 1996, 2009

MONOLITHIC CATCH BASIN CONNECTION

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 308–2 SHEET 1 OF 2

STRUCTURAL DATA							
B	t	C BARS	D&E BARS	B	t	C BARS	D&E BARS
12" (300 mm)	4" (115 mm)	#4 @ 6" (#13M @ 150 mm)	#5 (#16M)	42" (1050 mm)	7 1/2" (190 mm)	#5 @ 6" (#16M @ 150 mm)	#6 (#19M)
15" (375 mm)	4-1/4" (115 mm)			45" (1125 mm)	7 3/4" (190 mm)		
18" (450 mm)	4-1/2" (115 mm)			48" (1200 mm)	8" (215 mm)		
21" (525 mm)	5" (140 mm)			51" (1275 mm)	8 1/2" (215 mm)		
24" (600 mm)	5 1/4" (140 mm)			54" (1350 mm)	9" (240 mm)		
27" (675 mm)	5 1/2" (140 mm)			57" (1425 mm)	9 1/4" (240 mm)		
30" (750 mm)	6" (165 mm)			60" (1500 mm)	9 1/2" (240 mm)		
33" (825 mm)	6 1/4" (165 mm)			63" (1575 mm)	10" (260 mm)		
36" (900 mm)	6 1/2" (165 mm)			66" (1650 mm)	10 1/4" (260 mm)		
39" (975 mm)	7" (190 mm)			69" (1725 mm)	10 3/4" (280 mm)		
				72" (1800 mm)	11" (280 mm)		
FOR B GREATER THAN 72" (1800 mm) SEE PLANS							

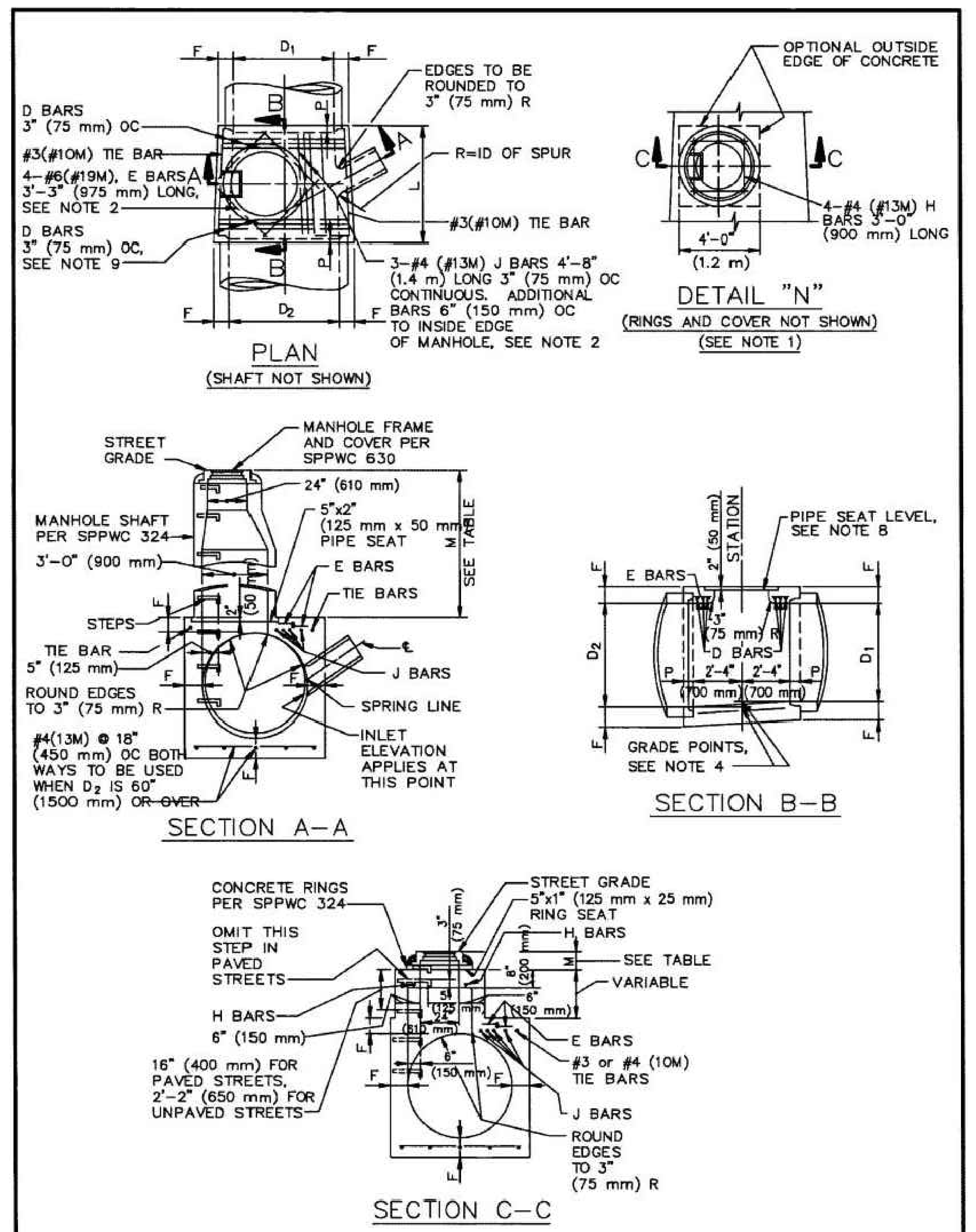
NOTES

1. REINFORCING STEEL SHALL BE 1–1/2" (40 mm) CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CATCH BASIN CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN SHALL BE CUT 2" (50 mm) CLEAR OF OPENING.
3. CONNECTION SHALL BE PLACED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY PLACING CONCRETE WITH THE SAME CLASS OF CONCRETE AS THE CATCH BASIN AGAINST A CURVED FORM WITH A RADIUS OF 3" (75 mm).
4. CONNECTIONS SHALL BE CONSTRUCTED WHEN:
   (A) PIPES INLET OR OUTLET THROUGH CORNER OF CATCH BASIN
   (B) ANGLE A FOR PIPES THROUGH 30" (750 mm) IN DIAMETER IS LESS THAN 70° OR GREATER THAN 110°.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MONOLITHIC CATCH BASIN CONNECTION

STANDARD PLAN 308–2 SHEET 2 OF 2



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

MANHOLE PIPE–TO–PIPE
MAIN LINE ID=36" (900 mm) OR LARGER

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 320–2 SHEET 1 OF 4

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'–10 1/2" (867 mm) FOR PAVED STREETS OR 3'–6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C–C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C–C. WHEN DIAMETER D_1 IS 48" (1200 mm) OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 2.
2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D_1 IS 48" (1200 mm) OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE AND OMIT J BARS.
3. L AND P SHALL HAVE THE FOLLOWING VALUES UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS:
   A. D_2=96" (2400 mm) OR LESS, L=5'–6" (1.7 m), P=5" (130 mm)
   B. D_2 OVER 96" (2400 mm), L=6'–0" (1.8 m), P=8" (210 mm)
   L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS. WHEN L GREATER THAN THAT SHOWN ABOVE IS SPECIFIED, D BARS SHALL BE CONTINUED 6" (150 mm) OC.
4. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES.
5. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
6. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
7. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
8. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES FOR F SHOWN ON SHEET 2.
9. D BARS SHALL BE #4 (#13M) FOR D_2=39" (975 mm) OR LESS, #5 (#16M) FOR D_2= 42" (1050 mm) TO 84" (2100 mm) INCLUSIVE AND #6 (#19M) FOR D_2= 90" (2250 mm) OR OVER.
10. CENTERLINE OF INLET PIPE SHALL INTERSECT INSIDE FACE OF CONE AT SPRING LINE UNLESS OTHERWISE SHOWN.
11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
   A. MAIN LINE = 36" (900 mm) INSIDE DIAMETER OR LARGER. EXCEPT IF THE MAIN LINE RCP DOWNSTREAM OF MANHOLE IS 36" (900 mm) TO 42" (1050 mm) INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" (825 mm) OR LESS SPPWC 321 SHALL BE USED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER

STANDARD PLAN 320–2 SHEET 3 OF 4

TABLE OF VALUES FOR F	
D_2	F
36" (900 mm)	6 1/2" (165 mm)
39" (975 mm)	7" (180 mm)
42" (1050 mm)	7 1/2" (190 mm)
45" (1125 mm)	7 3/4" (195 mm)
48" (1200 mm)	8" (205 mm)
51" (1275 mm)	8 1/2" (215 mm)
54" (1350 mm)	9" (230 mm)
57" (1425 mm)	9 1/4" (235 mm)
60" (1500 mm)	9 1/2" (240 mm)
63" (1575 mm)	10" (255 mm)
66" (1650 mm)	10 1/4" (260 mm)
69" (1725 mm)	10 3/4" (275 mm)
72" (1800 mm)	11" (280 mm)
78" (1950 mm)	11 3/4" (300 mm)
84" (2100 mm)	12 1/2" (320 mm)
90" (2250 mm)	13 1/4" (335 mm)
96" (2400 mm)	14" (355 mm)
102" (2550 mm)	15 1/2" (395 mm)
108" (2700 mm)	16" (405 mm)
114" (2850 mm)	16 1/2" (420 mm)
120" (3000 mm)	17" (430 mm)
126" (3150 mm)	17" (430 mm)
132" (3300 mm)	17 1/2" (445 mm)
138" (3450 mm)	17 1/2" (445 mm)
144" (3600 mm)	18" (455 mm)

TABLE OF VALUES FOR M (SEE NOTE 1)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN	MAX	MIN
A–A		2'–10 1/2" (867 mm)		3'–6" (1060 mm)
C–C	11" (282 mm)	8 1/2" (217 mm)	16" (410 mm)	15" (380 mm)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER

STANDARD PLAN 320–2 SHEET 2 OF 4

   B. THE OUTSIDE DIAMETER OF THE LATERAL MUST BE LESS THAN OR EQUAL TO 1/2 THE INSIDE DIAMETER OF THE MAIN LINE. IF THE UPSTREAM AND DOWNSTREAM DIAMETERS OF THE MANHOLE ARE NOT THE SAME, THE GOVERNING INSIDE DIAMETER OF THE MAIN LINE SHALL BE CONSIDERED TO BE THAT WHERE THE EXTENDED CENTERLINE OF THE LATERAL ENTERS THE MANHOLE.
   C. IN NO INSTANCE SHALL THE INSIDE DIAMETER OF THE LATERAL TO THE MANHOLE BE GREATER THAN 30" (750 mm).
13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
   324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
   328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
   329 PRESSURE MANHOLE SHAFT 36" (914 mm) WITHOUT REDUCER
   630 24" (610 mm) MANHOLE FRAME AND COVER
   633 36" (914 mm) MANHOLE FRAME AND COVER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER

STANDARD PLAN 320–2 SHEET 4 OF 4

Know what's **below.**
Call 811 before you dig.

REVISIONS			
MARK	DATE	BY	APPROVED/RCE NO.

DESIGNED BY: WLG DATE: 5/31/2023
DRAWN BY: WLG DATE: 5/31/2023
CHECKED BY: DATE:

CITY OF ONTARIO

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER DATE

BENCH MARK No. CC–18–1
ELEV. 688.825' (NAVD '88) LEVEL RUN 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO CC–18–1." SET ON MOC OF THE HCR CURB @ THE SOUTHEAST RETURN OF EDISON AVE. AND EUCLID AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989–9789 FAX: (909) 989–9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 5/31/2023 DATE

STORM DRAIN IMPROVEMENT PLAN (PUBLIC)

SCHAEFER AVENUE

DETAILS

PM-20714

SHEET 8 OF 8
CONTRACT
ACCOUNT
DWG. NO.

Drawing Name: Z:\Shared\Project\Year_2022\2022-294 EMJSP – Distinguished Homes – Jason Lee\06 Engineering\Sheets\Off-Site\STORM DRAIN PLANS\07_08_2022-294_SD_DET.dwg
Last Opened: May 31, 2023 – 1:08pm by: Jose

05/31/2023

EXHIBITS

EXHIBIT A: EUCLID AVENUE STORM DRAIN DRAINAGE FACILITIES MAP

EUCLID MIXED USE SPECIFIC PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

EUCLID AVENUE STORM DRAIN DRAINAGE FACILITIES MAP

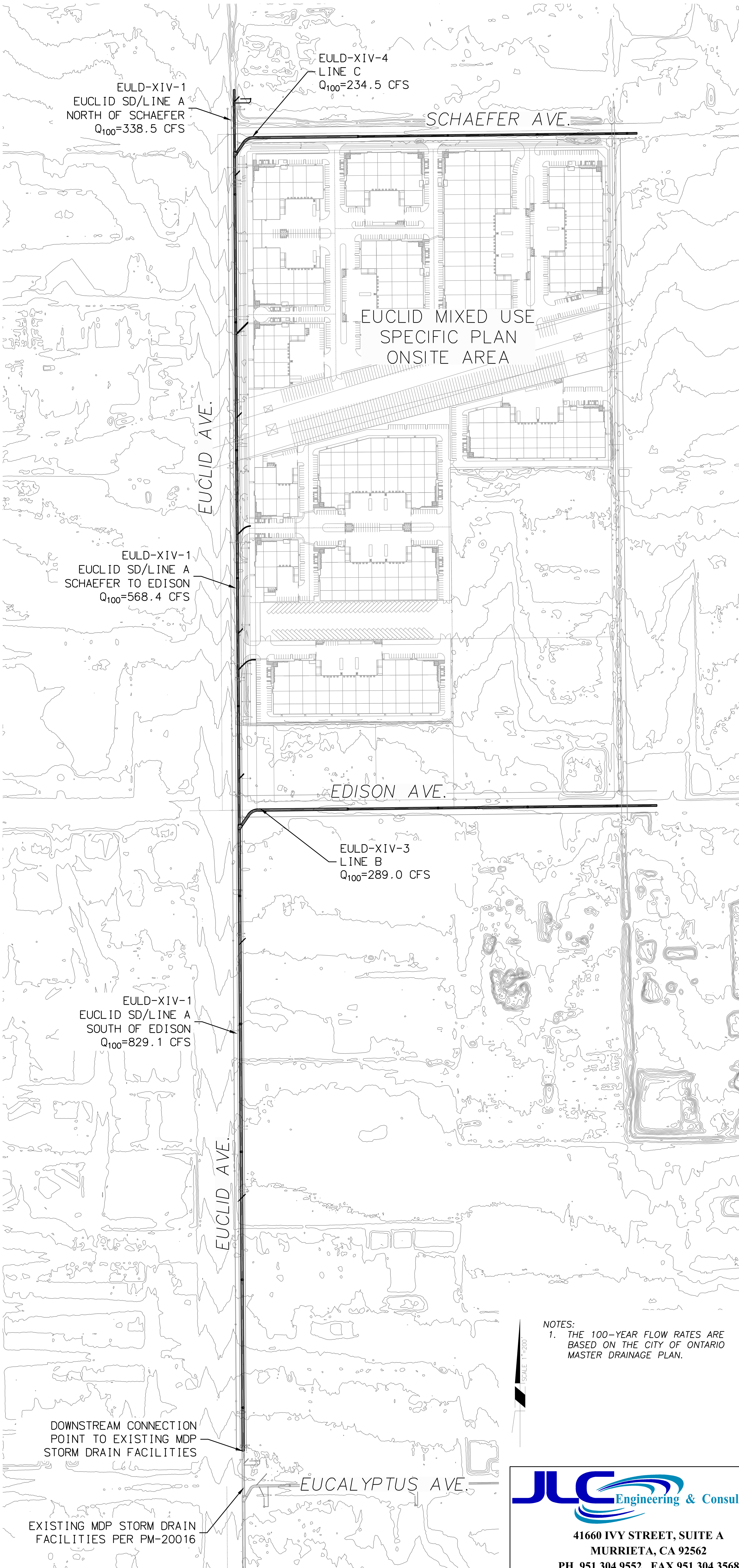


EXHIBIT "A"

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EUCLID MIXED USE SPECIFIC PLAN

EUCLID AVENUE STORM DRAIN DRAINAGE FACILITIES MAP