Seneca Business Park and Storage

Preliminary Drainage Study

City of Adelanto

San Bernardino County

State of California

PREPARED BY:

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909-684-0093

Prepared for:

Adelanto Seneca Land LLC

March 15, 2024

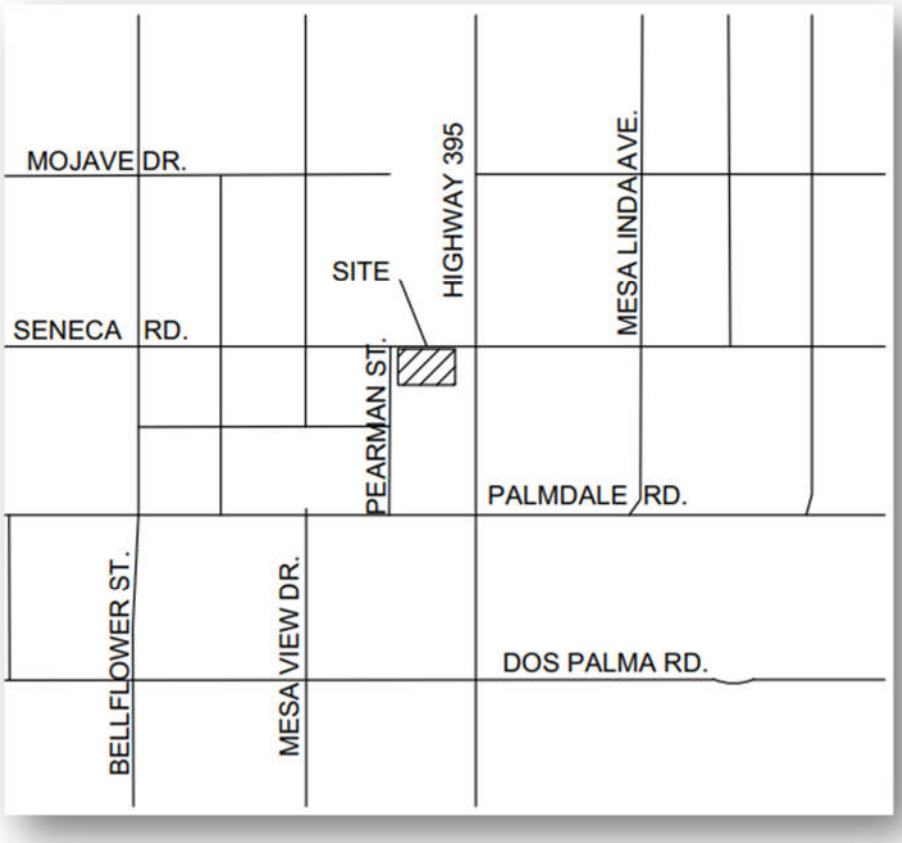
Contents

1. Introduction

The purpose of this Preliminary Drainage Study is to determine the extent of 100-year storm facilities required for the development of this project.

Seneca Business Park and Storage project will be a business park and storage facility in the City of Adelanto, San Bernardino County, California. The proposed site is located on approximately 9 acres in the southeast area of the city, with access along the south side of Seneca Road, Pearmain Street comprising the westerly boundary, and vacant property to the south and east. State Route 395 is approximately 600 feet to the east.

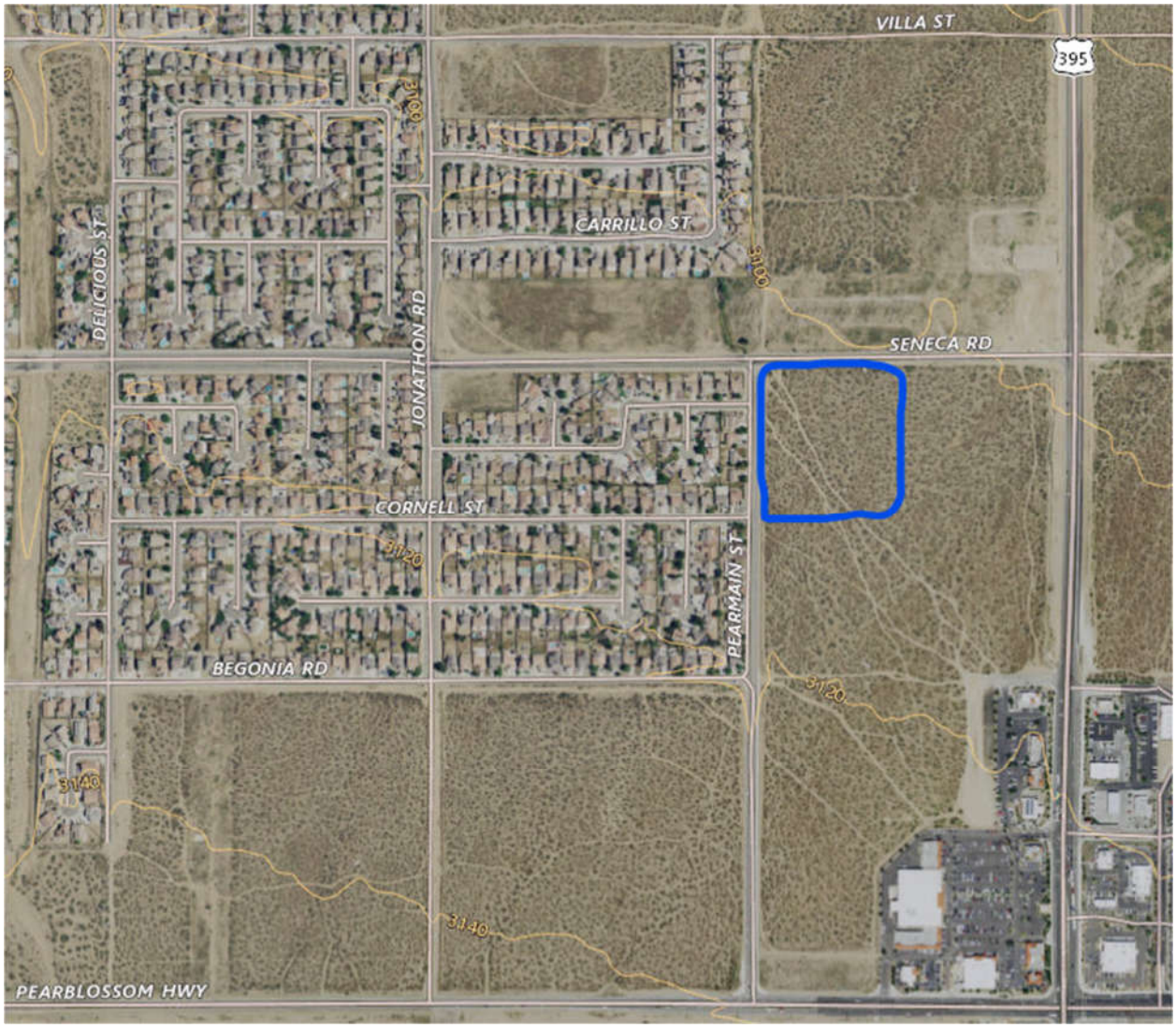
Vicinity Map



2. Methodology

The 100-year storm event was modeled in the rational method and synthetic unit hydrograph hydrology calculations in this study.

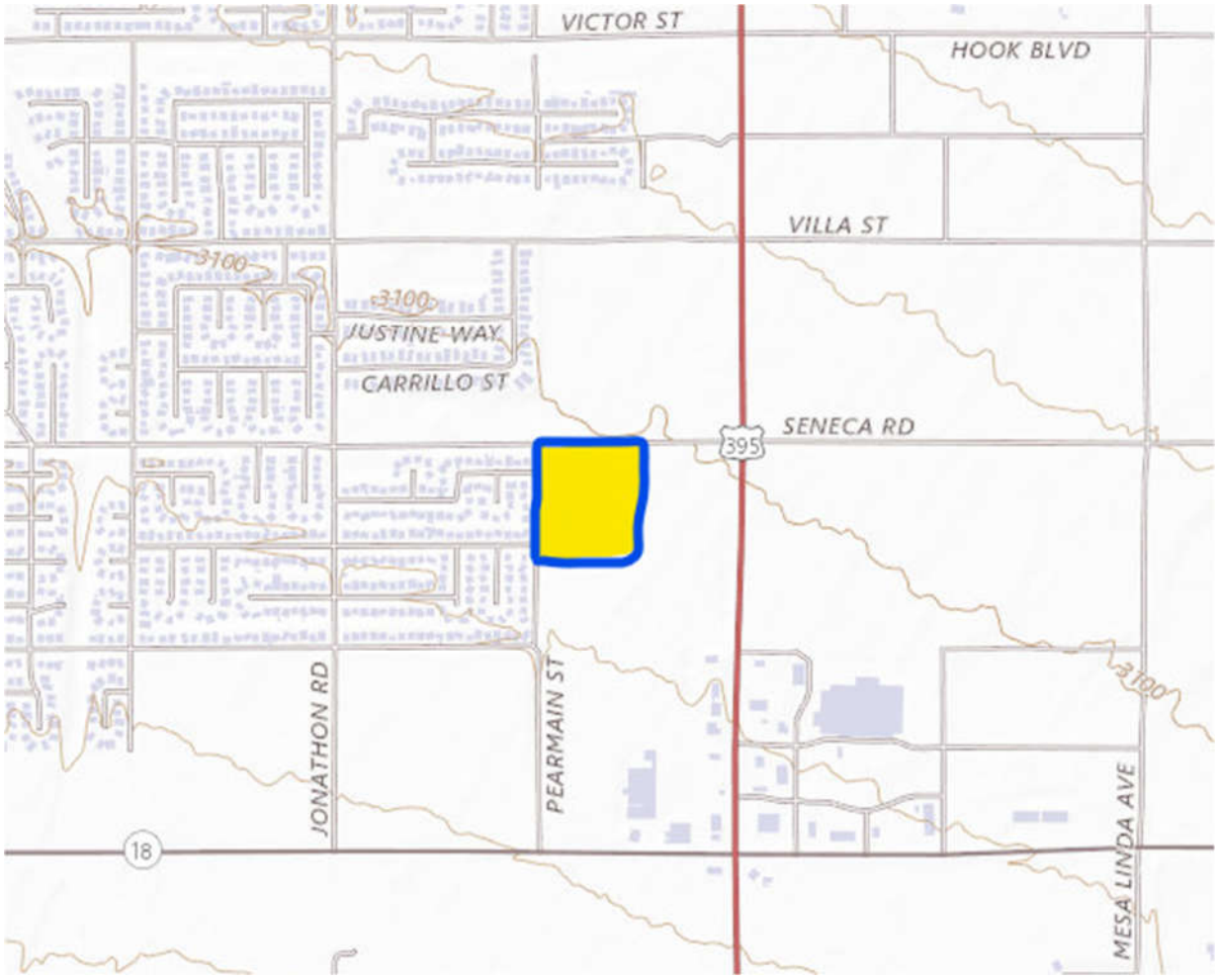
The rational method hydrologic model, as defined by Flood Control for San Bernardino County, was followed in the determination of storm runoff. CivilDesign's WSPGW hydraulic software program or spreadsheets using standard Manning's equations were used to validate inlet and pipe sizes.



3. Existing Condition

The subject property is currently undeveloped with native grass and limited brush cover on approximately 9 acres. There are no improvements on the existing site. The site is served by Seneca Road along the north side, which will be widened to the ultimate width as part of this project. Pearmain Street bounds the site to the west, with vacant land on the other sides.

The site is relatively flat, with existing drainage patterns generally conveying runoff northeasterly to Seneca Road, however a small portion of the site is tributary to the intersection of Pearmain Street and Seneca Road. There is runon from southerly off-site areas onto the property.



4. Proposed Development

The proposed development project will consist of two office buildings and five self-storage buildings, with covered and uncovered RV Parking, along with associated parking, access and landscaping, served by a proposed driveways along Seneca Road.

5. Proposed Drainage Improvements

Site runoff will be by sheetflow and concentrated v-gutter, collected in drop inlets and ultimately to a proposed detention basin. Mitigated discharge from the site will be out onto Seneca Road toward the easterly property line.

Off-site runon drainage will be collected in a perimeter v-gutter located along the south and east sides of the property. This gutter will drain to the proposed detention basin.

A requirement of development is to limit proposed runoff to a condition below the existing peak flow. The aforementioned detention basin is proposed for this purpose. Calculations herein demonstrate that runoff will not exceed the existing condition.

6. Hydrologic Calculations Summary

Below is a table with a summary of the hydrologic calculations. Existing, Proposed and Routed peak flows are depicted. Calculations are included in Appendix C.

Hydrologic Summary Table					
Subarea	Design Storm Frequency	Existing Condition Peak Flow	Proposed Condition Peak Flow	Routed Peak Flow	Notes
		cfs	cfs	cfs	
On & Off Site	100-year	30.7	35.1	26.7 cfs	Developed is 87% of Existing

7. Hydraulic Calculations Summary

Hydraulic calculations have been completed for the various conveyances proposed for this project, and are summarized below. See Appendix D for calculations.

Hydraulic Summary Table

Conveyance	Purpose	Design Storm Frequency	Reach / ID	Peak Flow	Parameters
				cfs	

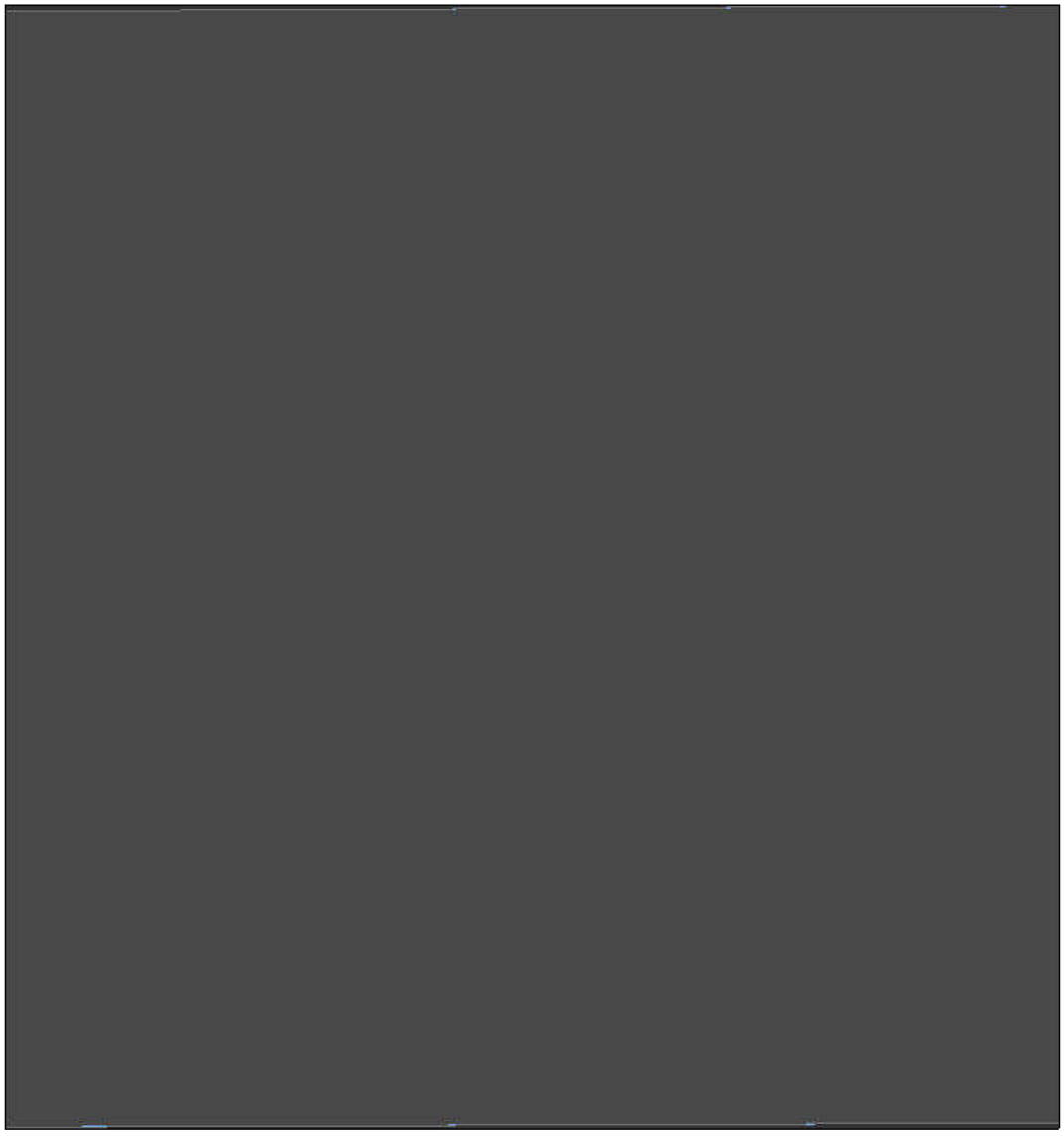
Appendix A. References

WQMP Project Report - San Bernardino Co. Stormwater Program

Area of Interest (AOI) Information

Area : 421,724.5 ft²

Sep 22 2023 8:28:33 Pacific Daylight Time



Project Site Parcel Numbers

#	ParcelNumber	Acreage	Area(ft²)
1	310351108	9.68	421,724.50

Drainage Segment Details

#	System Number	Facility Name	Closest channel segment's susceptibility to Hydromodification	Highest downstream hydromodification susceptibility	Is this drainage segment subject to TMDLs?
1	4-405-1B	El Evado Channel	EHM	NULL	No

#	Are there downstream drainage segments subject to TMDLs?	Is this drainage segment a 303d listed stream?	Are there 303d listed streams downstream?	Area(ft²)
1	No	No	No	421,724.50

Onsite Soil Groups

#	Onsite Soils Group	Soil Type	Soil Type Abbreviation	Area(ft²)
1	Soils - Hydro Group A	CAJON SAND, 0 TO 2 PERCENT SLOPES	CAJON SAND	421,724.50

Mojave Ground Squirrel within 200' (ISP)

#	Yes/no	Area(ft²)
1	IN	421,724.50

Note: The information provided in this report and on the Stormwater Geodatabase for the County of San Bernardino Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification. without independent verification.

NOAA Atlas 14, Volume 6, Version 2
Location name: Adelanto, California, USA*
Latitude: 34.5133°, Longitude: -117.4028°
Elevation: 3105 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.081 (0.067-0.099)	0.115 (0.095-0.141)	0.161 (0.132-0.197)	0.199 (0.162-0.246)	0.251 (0.198-0.321)	0.293 (0.226-0.382)	0.335 (0.253-0.449)	0.380 (0.279-0.523)	0.442 (0.311-0.634)	0.491 (0.334-0.729)
10-min	0.116 (0.096-0.142)	0.165 (0.136-0.202)	0.230 (0.190-0.283)	0.285 (0.232-0.352)	0.360 (0.284-0.461)	0.419 (0.324-0.548)	0.481 (0.363-0.644)	0.545 (0.400-0.750)	0.634 (0.446-0.909)	0.704 (0.479-1.04)
15-min	0.140 (0.116-0.172)	0.199 (0.164-0.244)	0.279 (0.229-0.342)	0.344 (0.281-0.426)	0.436 (0.344-0.557)	0.507 (0.392-0.663)	0.582 (0.439-0.778)	0.659 (0.484-0.907)	0.767 (0.540-1.10)	0.851 (0.579-1.26)
30-min	0.203 (0.167-0.248)	0.288 (0.238-0.352)	0.402 (0.331-0.494)	0.497 (0.406-0.615)	0.629 (0.497-0.805)	0.733 (0.566-0.957)	0.840 (0.634-1.12)	0.952 (0.699-1.31)	1.11 (0.780-1.59)	1.23 (0.836-1.82)
60-min	0.260 (0.215-0.318)	0.370 (0.305-0.453)	0.517 (0.425-0.635)	0.639 (0.521-0.791)	0.808 (0.638-1.03)	0.941 (0.728-1.23)	1.08 (0.815-1.44)	1.22 (0.898-1.68)	1.42 (1.00-2.04)	1.58 (1.08-2.34)
2-hr	0.364 (0.301-0.445)	0.493 (0.407-0.604)	0.670 (0.552-0.823)	0.820 (0.669-1.02)	1.03 (0.815-1.32)	1.20 (0.930-1.57)	1.38 (1.04-1.85)	1.57 (1.15-2.16)	1.84 (1.29-2.63)	2.05 (1.39-3.04)
3-hr	0.450 (0.372-0.550)	0.600 (0.495-0.735)	0.808 (0.665-0.992)	0.986 (0.805-1.22)	1.24 (0.979-1.59)	1.45 (1.12-1.89)	1.66 (1.26-2.23)	1.90 (1.39-2.61)	2.22 (1.57-3.19)	2.49 (1.69-3.70)
6-hr	0.611 (0.504-0.747)	0.809 (0.667-0.990)	1.08 (0.893-1.33)	1.32 (1.08-1.64)	1.67 (1.32-2.13)	1.95 (1.51-2.54)	2.25 (1.70-3.01)	2.57 (1.89-3.54)	3.04 (2.14-4.36)	3.42 (2.33-5.08)
12-hr	0.763 (0.630-0.933)	1.04 (0.860-1.28)	1.43 (1.18-1.76)	1.76 (1.44-2.18)	2.25 (1.77-2.87)	2.64 (2.04-3.45)	3.06 (2.31-4.09)	3.51 (2.58-4.83)	4.16 (2.93-5.96)	4.69 (3.19-6.96)
24-hr	1.02 (0.908-1.18)	1.45 (1.28-1.67)	2.04 (1.80-2.36)	2.54 (2.23-2.96)	3.27 (2.77-3.94)	3.86 (3.20-4.74)	4.48 (3.63-5.64)	5.15 (4.06-6.67)	6.12 (4.62-8.26)	6.90 (5.04-9.65)
2-day	1.11 (0.987-1.28)	1.58 (1.40-1.82)	2.23 (1.97-2.58)	2.79 (2.45-3.25)	3.60 (3.05-4.33)	4.25 (3.53-5.23)	4.95 (4.01-6.24)	5.71 (4.50-7.40)	6.80 (5.14-9.18)	7.69 (5.62-10.7)
3-day	1.19 (1.06-1.37)	1.69 (1.50-1.95)	2.39 (2.11-2.76)	2.99 (2.62-3.48)	3.85 (3.26-4.64)	4.55 (3.78-5.60)	5.31 (4.30-6.68)	6.12 (4.82-7.93)	7.30 (5.52-9.86)	8.28 (6.04-11.6)
4-day	1.28 (1.13-1.47)	1.80 (1.60-2.08)	2.55 (2.25-2.95)	3.19 (2.80-3.72)	4.11 (3.48-4.95)	4.86 (4.03-5.97)	5.66 (4.58-7.13)	6.53 (5.14-8.45)	7.78 (5.88-10.5)	8.81 (6.43-12.3)
7-day	1.37 (1.21-1.57)	1.92 (1.70-2.22)	2.71 (2.40-3.13)	3.38 (2.96-3.94)	4.35 (3.69-5.24)	5.13 (4.26-6.30)	5.95 (4.82-7.50)	6.84 (5.39-8.86)	8.11 (6.13-10.9)	9.14 (6.67-12.8)
10-day	1.45 (1.28-1.67)	2.04 (1.80-2.35)	2.86 (2.53-3.31)	3.57 (3.13-4.16)	4.59 (3.89-5.53)	5.41 (4.49-6.65)	6.27 (5.08-7.90)	7.19 (5.67-9.32)	8.51 (6.43-11.5)	9.57 (6.99-13.4)
20-day	1.71 (1.51-1.96)	2.41 (2.13-2.78)	3.40 (3.00-3.93)	4.26 (3.73-4.96)	5.49 (4.65-6.61)	6.48 (5.38-7.97)	7.54 (6.10-9.50)	8.66 (6.82-11.2)	10.2 (7.74-13.8)	11.5 (8.40-16.1)
30-day	1.96 (1.74-2.26)	2.76 (2.45-3.18)	3.91 (3.45-4.52)	4.90 (4.30-5.71)	6.35 (5.38-7.65)	7.52 (6.24-9.25)	8.76 (7.10-11.0)	10.1 (7.94-13.1)	11.9 (9.02-16.1)	13.4 (9.79-18.7)
45-day	2.28 (2.03-2.63)	3.20 (2.84-3.69)	4.53 (4.00-5.24)	5.69 (4.99-6.63)	7.41 (6.28-8.92)	8.82 (7.32-10.8)	10.3 (8.34-13.0)	11.9 (9.36-15.4)	14.1 (10.7-19.1)	15.9 (11.6-22.2)
60-day	2.55 (2.26-2.93)	3.54 (3.13-4.08)	4.99 (4.41-5.77)	6.28 (5.50-7.32)	8.18 (6.94-9.85)	9.76 (8.10-12.0)	11.4 (9.27-14.4)	13.2 (10.4-17.1)	15.8 (11.9-21.3)	17.8 (13.0-24.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

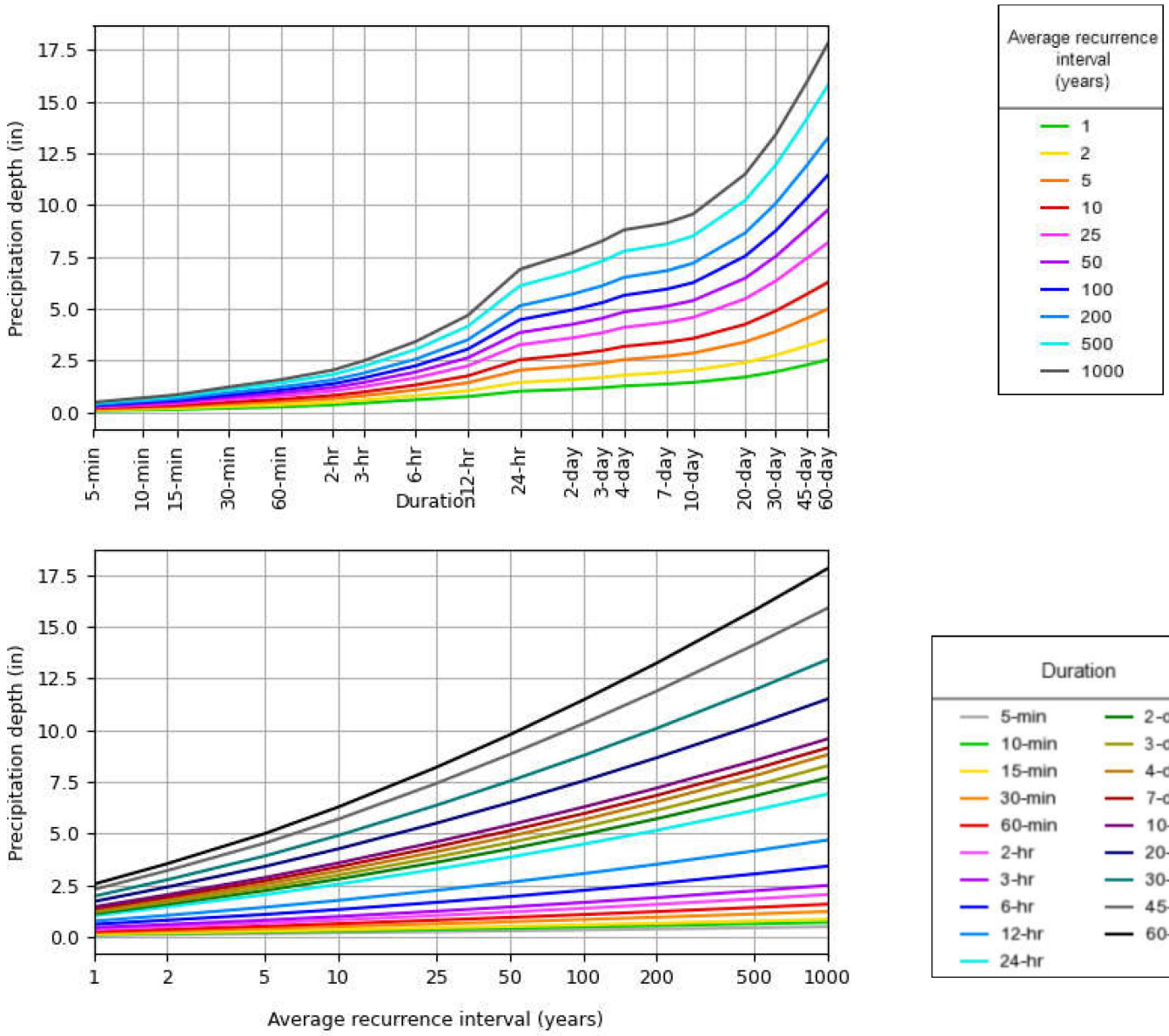
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 34.5133°, Longitude: -117.4028°



NOAA Atlas 14, Volume 6, Version 2

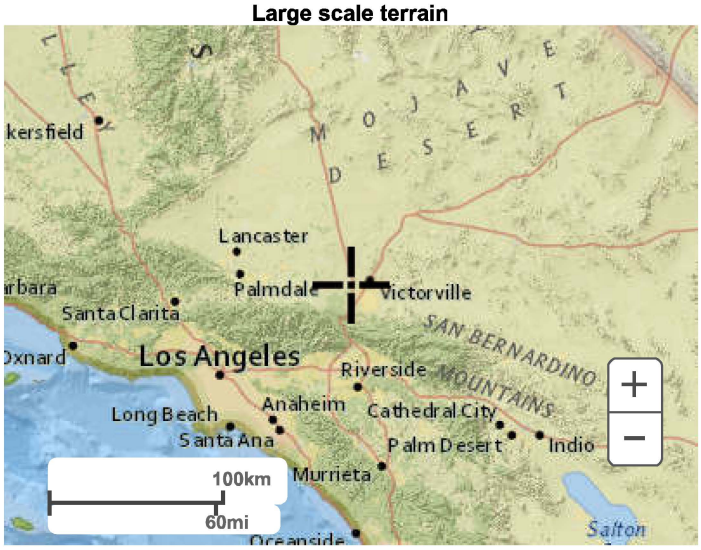
Created (GMT): Fri Sep 22 15:26:28 2023

Back to Top

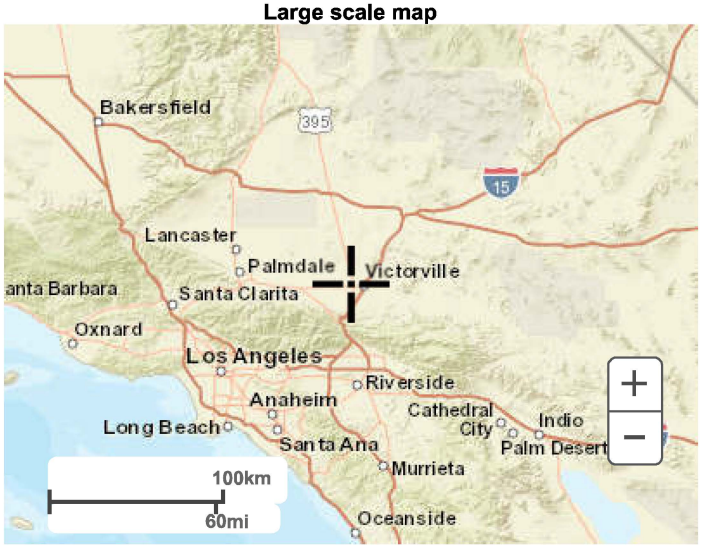
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

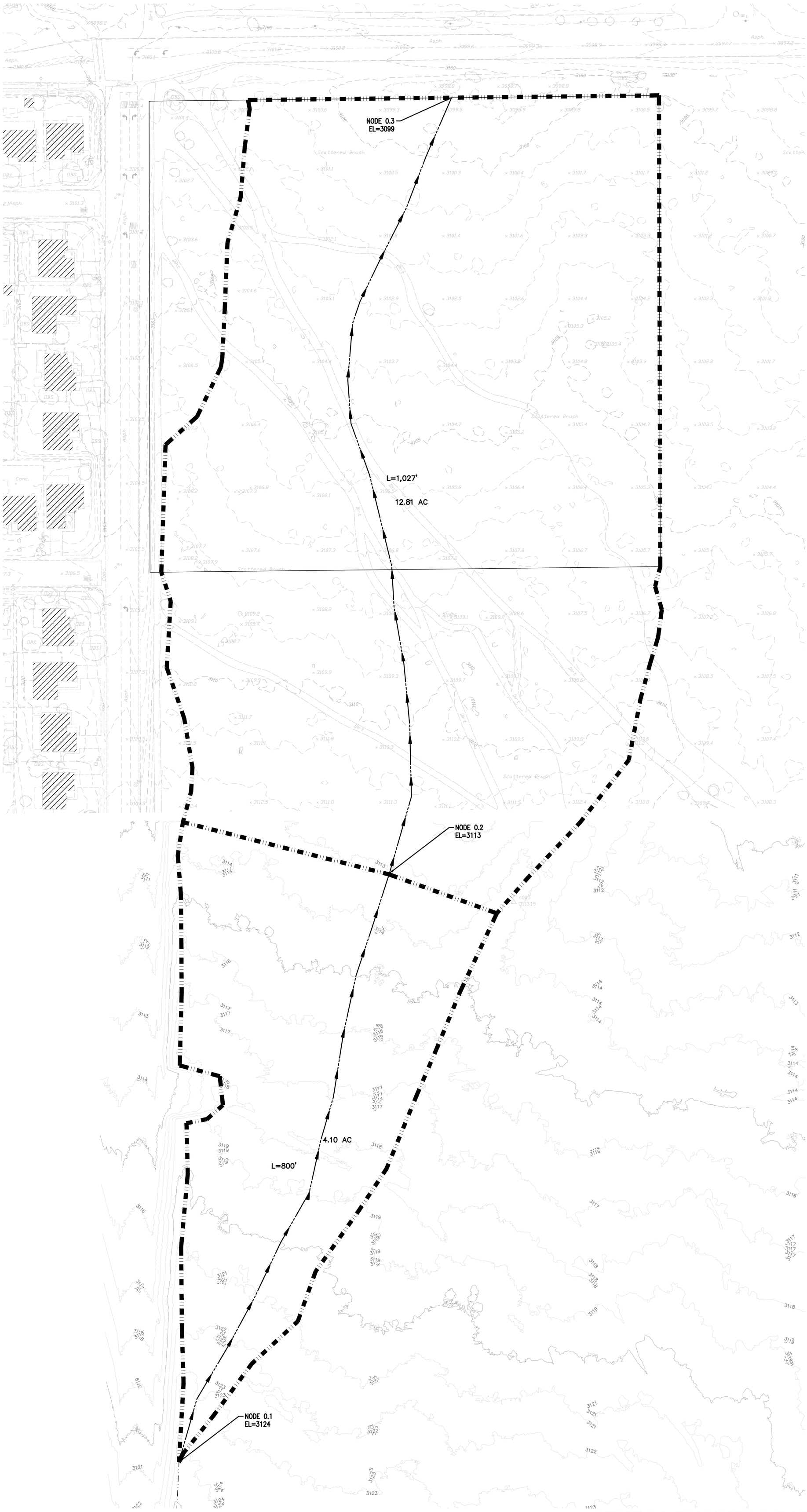
Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Appendix B. Hydrology Maps

SENECA BUSINESS PARK AND STORAGE

EXISTING CONDITION HYDROLOGY MAP



GRAPHIC SCALE

0 30 60 120

(IN FEET)

1 INCH = 60 FT.

ENCOMPASS ASSOCIATES, INC.

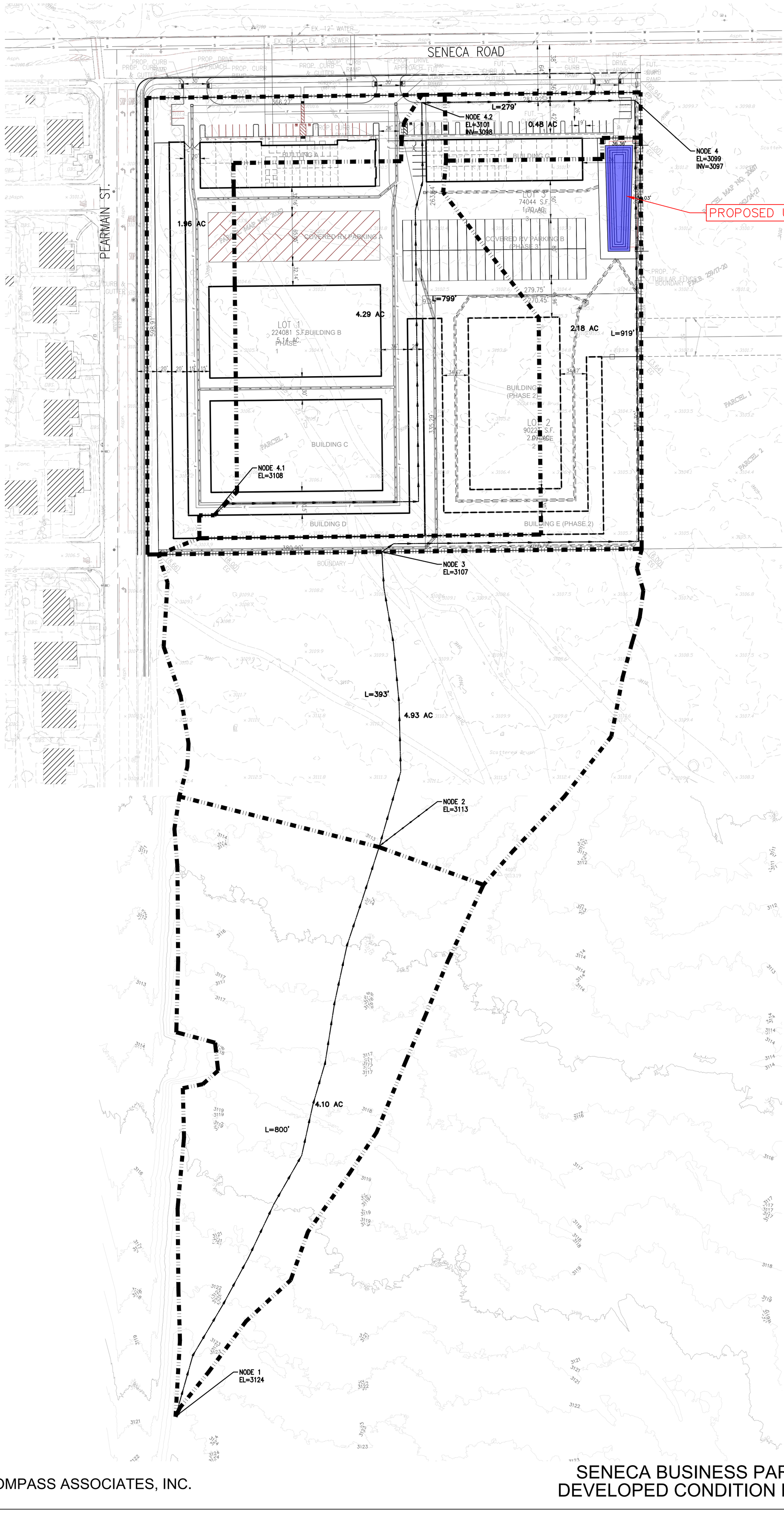
TPM 20841

SENECA BUSINESS PARK AND STORAGE

EXISTING CONDITION HYDROLOGY MAP

SENECA BUSINESS PARK AND STORAGE

DEVELOPED CONDITION HYDROLOGY MAP



ENCOMPASS ASSOCIATES, INC.

TPM 20841
SENECA BUSINESS PARK AND STORAGE
DEVELOPED CONDITION HYDROLOGY MAP

Appendix C. Hydrologic Calculations

RATIONAL METHOD

HYDROLOGY

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 ****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2012 Advanced Engineering Software (aes)
             Ver. 19.0  Release Date: 06/01/2012  License ID 1584

                           Analysis prepared by:

                         ENCOMPASS ASSOCIATES, INC.
                             5699 Cousins Place
                         Rancho Cucamonga CA 91737
                    909-684-0093 askeers@encompasscivil.com

 ************************** DESCRIPTION OF STUDY **************************
* RV STORAGE AT SEC SENECA AND PEARMAIN                                    *
* EXISTING, DEVELOPED HYDROLOGY                                            *
* 100-YEAR                                                                 *
 ****************************************************************************

  FILE NAME: X:\FTP\AES\ADERVE00.DAT
  TIME/DATE OF STUDY: 06:41 01/20/2024
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.7000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.0800

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE      0.10 TO NODE      0.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   800.00
  ELEVATION DATA: UPSTREAM(FEET) =   3124.00  DOWNSTREAM(FEET) =   3113.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.936
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.515
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    A        4.10      0.30     1.000    85   17.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.19
  TOTAL AREA(ACRES) =      4.10   PEAK FLOW RATE(CFS) =      8.19

****************************************************************************
  FLOW PROCESS FROM NODE      0.20 TO NODE      0.30 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3113.00  DOWNSTREAM(FEET) =   3009.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1043.00   CHANNEL SLOPE =  0.0997
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.19
  FLOW VELOCITY(FEET/SEC) =   7.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.32   Tc(MIN.) =   20.25
  LONGEST FLOWPATH FROM NODE      0.10 TO NODE      0.30 =    1843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      0.30 TO NODE      0.30 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.310
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    A       12.81      0.30     1.000    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   12.81      SUBAREA RUNOFF(CFS) =   23.22
  EFFECTIVE AREA(ACRES) =     16.91   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =       16.9       PEAK FLOW RATE(CFS) =      30.65

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   800.00
  ELEVATION DATA: UPSTREAM(FEET) =   3124.00  DOWNSTREAM(FEET) =   3113.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.936
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.515
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                     A        4.10      0.30     1.000    85   17.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.19
  TOTAL AREA(ACRES) =      4.10   PEAK FLOW RATE(CFS) =      8.19

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3113.00  DOWNSTREAM(FEET) =   3107.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   393.00   CHANNEL SLOPE =  0.0153
  CHANNEL FLOW THRU SUBAREA(CFS) =       8.19
  FLOW VELOCITY(FEET/SEC) =   2.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =   20.17
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1193.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.317
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                     A        4.93      0.30     1.000    85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    4.93      SUBAREA RUNOFF(CFS) =    8.97
  EFFECTIVE AREA(ACRES) =      9.03   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =        9.0       PEAK FLOW RATE(CFS) =      16.42

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   3107.00
  DOWNSTREAM NODE ELEVATION(FEET) =   3101.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   869.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.500
  PAVEMENT LIP(FEET) =  0.200   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
```

```
  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.037
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.18      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     18.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.55
  AVERAGE FLOW DEPTH(FEET) =   0.95   FLOOD WIDTH(FEET) =   27.79
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   4.08   Tc(MIN.) =   24.24
  SUBAREA AREA(ACRES) =    2.18       SUBAREA RUNOFF(CFS) =    3.85
  EFFECTIVE AREA(ACRES) =   11.21     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.31  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =       11.2          PEAK FLOW RATE(CFS) =      18.00

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOOD WIDTH(FEET) =   27.43
  FLOW VELOCITY(FEET/SEC.) =   3.55   DEPTH*VELOCITY(FT*FT/SEC) =   3.35
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =    2062.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.24
  RAINFALL INTENSITY(INCH/HR) =   2.04
  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.31
  AREA-AVERAGED Ap =  0.82
  EFFECTIVE STREAM AREA(ACRES) =      11.21
  TOTAL STREAM AREA(ACRES) =      11.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      18.00

****************************************************************************
  FLOW PROCESS FROM NODE      4.10 TO NODE      4.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   799.00
  ELEVATION DATA: UPSTREAM(FEET) =   3108.00  DOWNSTREAM(FEET) =   3101.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.360
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.462
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        4.29      0.74     0.100    52   11.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     13.08
```

```
  TOTAL AREA(ACRES) =      4.29   PEAK FLOW RATE(CFS) =     13.08

****************************************************************************
  FLOW PROCESS FROM NODE      4.20 TO NODE      4.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.462
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.96      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.96      SUBAREA RUNOFF(CFS) =    5.98
  EFFECTIVE AREA(ACRES) =      6.25   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.2       PEAK FLOW RATE(CFS) =      19.06

****************************************************************************
  FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  3098.00  DOWNSTREAM(FEET) =  3097.00
  FLOW LENGTH(FEET) =   279.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.58
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.06
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   12.07
  LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =    1078.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.319
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.48      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.48      SUBAREA RUNOFF(CFS) =    1.40
  EFFECTIVE AREA(ACRES) =      6.73   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.7       PEAK FLOW RATE(CFS) =      19.65

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.07
  RAINFALL INTENSITY(INCH/HR) =   3.32
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.73
  TOTAL STREAM AREA(ACRES) =       6.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.65

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       18.00   24.24    2.037  0.31( 0.25) 0.82      11.2       1.00
      2       19.65   12.07    3.319  0.74( 0.07) 0.10       6.7       4.10

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       35.05   12.07    3.319  0.36( 0.16) 0.43      12.3       4.10
      2       29.88   24.24    2.037  0.34( 0.19) 0.55      17.9       1.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      35.05    Tc(MIN.) =    12.07
  EFFECTIVE AREA(ACRES) =      12.31   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.36  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =       17.9
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =    2062.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       17.9  TC(MIN.) =     12.07
  EFFECTIVE AREA(ACRES) =     12.31  AREA-AVERAGED Fm(INCH/HR)=  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.36  AREA-AVERAGED Ap = 0.429
  PEAK FLOW RATE(CFS)   =      35.05

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       35.05   12.07    3.319  0.36( 0.16) 0.43      12.3       4.10
      2       29.88   24.24    2.037  0.34( 0.19) 0.55      17.9       1.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

SYNTHETIC UNIT HYDROGRAPH

CALCULATIONS

AND

DETENTION BASIN

FLOOD ROUTING

ANALYSIS

Encompass Associates, Inc.
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Seneca Bus Park TPM 20841 900-900.138
Adelanto 3/13/24

AMC Type III (I,II or III)

Maximum Loss Rate **Developed** Set # 1

Cover	Area	%	Soil type	Area	%	CN-II	CN-III	Ap	%	S	Fp (F.C-6)	Fm	Fm (wt)
com	8.87	0.50	A	8.87	0.50	32	52	0.1	0.05	9.23	0.74	0.07	0.03
grass poor	9.03	0.50	A	9.03	0.50	67	85	1	0.50	1.76	0.3075	0.31	0.16
(AutoCalc: Impervious)				(8)	(0.45)		98	0	0.45	0.2			
	17.9			17.9								Fm=	0.19

Low Loss Fraction

Return Period	**2**	1.45 in		**10**	2.54 in		**25**	3.27 in		**100**	4.48 in	
Cover	Ia	Y	Y (wt)	Ia	Y	Y (wt)	Ia	Y	Y (wt)	Ia	Y	Y (wt)
com	1.85	0.01	0.00	1.85	0.02	0.00	1.85	0.06	0.00	1.85	0.13	0.01
grass poor	0.35	0.29	0.15	0.35	0.48	0.24	0.35	0.56	0.28	0.35	0.65	0.33
(AutoCalc: Impervious)	0.04	0.85	0.38	0.04	0.91	0.41	0.04	0.93	0.41	0.04	0.95	0.42
		Y=	0.53		Y=	0.65		Y=	0.70		Y=	0.76
Low Loss Fraction,Y-bar =			0.47			0.35			0.30			0.24
Est Vol (ac-ft)=			1			2			3			5

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Seneca Bus Park TPM 20841 900-900.138
Adelanto 3/13/24

1	Design Storm		yr	2	10	25	100
2	Catchment Lag time		hrs	0.00	0.00	0.00	0.16
			Tc (min)	0	0	0	12.1
3	Catchment Area	acres 17.9					
4	Base flow	cfs/sq mi 0					
5	S-graph	n/a					
6	Maximum loss rate, Fm	in/hr 0.19					
7	Low loss fraction, Y-bar			0.47	0.35	0.30	0.24
8	Watershed area-averaged 5-minute point rainfall		inches	0.18	0.30	0.38	0.51
	Watershed area-averaged 30-minute point rainfall		inches	0.30	0.52	0.66	0.88
	Watershed area-averaged 1-hour point rainfall		inches	0.37	0.64	0.81	1.08
	Watershed area-averaged 3-hour point rainfall		inches	0.60	1.00	1.26	1.69
	Watershed area-averaged 6-hour point rainfall		inches	0.81	1.32	1.67	2.25
	Watershed area-averaged 24-hour point rainfall		inches	1.45	2.54	3.27	4.48
9	24-hour storm unit interval (use TC for Small UH)		minutes	5			

Seneca Bus Park TPM 20841
900-900.138
3/13/24

Subarea	1	
(sheet)	Losses1	
Storm	100	year
I-60min	1.08	
I-6hr	2.25	
Slope	0.7	
Ac	17.9	ac
TC	12.1	min
Calibration	0.80	
fm	0.19	in/hr
	0.00318	in/min
Y-bar	0.24	

Peak	Total
40.21	3.6092

T	Q	V
(hrs)	(cfs)	(ac-ft)
0	0	0
	0.64	0
0.4	0.64	0.0212
0.6	0.64	0.0318
0.8	1.29	0.0478
1	0.64	0.0638
1.2	1.29	0.0798
1.4	1.29	0.1011
1.6	0.64	0.1171
1.8	1.29	0.1331
2	0.64	0.1491
2.2	0.64	0.1597
2.4	1.29	0.1757
2.6	1.29	0.197
2.8	0.64	0.213
3	0.64	0.2236
3.2	1.29	0.2396
3.4	1.29	0.2609

T	Q	V
(hrs)	(cfs)	(ac-ft)
3.6	1.29	0.2822
3.8	1.29	0.3035
4	0.64	0.3195
4.2	1.29	0.3355
4.4	0.64	0.3515
4.6	0.64	0.3621
4.8	1.29	0.3781
5	0.64	0.3941
5.2	1.29	0.4101
5.4	1.29	0.4314
5.6	0.64	0.4474
5.8	1.29	0.4634
6	1.29	0.4847
6.2	1.29	0.506
6.4	1.29	0.5273
6.6	1.29	0.5486
6.8	1.29	0.5699
7	1.29	0.5912
7.2	1.29	0.6125
7.4	1.29	0.6338
7.6	1.29	0.6551
7.8	1.29	0.6764
8	1.29	0.6977
8.2	1.29	0.719
8.4	1.29	0.7403
8.6	1.29	0.7616
8.8	1.29	0.7829
9	1.29	0.8042
9.2	1.29	0.8255
9.4	1.29	0.8468
9.6	1.29	0.8681
9.8	1.29	0.8894
10	1.29	0.9107
10.2	1.29	0.932
10.4	1.29	0.9533
10.6	1.29	0.9746
10.8	1.29	0.9959
11	1.29	1.0172
11.2	1.29	1.0385
11.4	1.29	1.0598

T	Q	V
(hrs)	(cfs)	(ac-ft)
11.6	1.29	1.0811
11.8	1.29	1.1024
12	1.29	1.1237
12.2	1.29	1.145
12.4	1.93	1.1716
12.6	1.29	1.1982
12.8	1.29	1.2195
13	1.93	1.2461
13.2	1.29	1.2727
13.4	1.93	1.2993
13.6	1.93	1.3312
13.8	1.93	1.3631
14	1.93	1.395
14.2	2.58	1.4323
14.4	2.58	1.4749
14.6	2.58	1.5175
14.8	3.22	1.5654
15	3.22	1.6186
15.2	3.22	1.6718
15.4	4.51	1.7357
15.6	3.22	1.7996
15.8	5.16	1.8689
16	7.09	1.9701
16.2	40.21	2.361
16.4	3.87	2.7253
16.6	3.22	2.7839
16.8	3.22	2.8371
17	2.58	2.885
17.2	2.58	2.9276
17.4	1.93	2.9649
17.6	1.93	2.9968
17.8	1.93	3.0287
18	1.29	3.0553
18.2	1.29	3.0766
18.4	1.29	3.0979
18.6	1.29	3.1192
18.8	1.29	3.1405
19	1.29	3.1618
19.2	1.29	3.1831
19.4	1.29	3.2044

T	Q	V
(hrs)	(cfs)	(ac-ft)
19.6	1.29	3.2257
19.8	1.29	3.247
20	1.29	3.2683
20.2	1.29	3.2896
20.4	1.29	3.3109
20.6	1.29	3.3322
20.8	0.64	3.3482
21	1.29	3.3642
21.2	0.64	3.3802
21.4	1.29	3.3962
21.6	1.29	3.4175
21.8	1.29	3.4388
22	1.29	3.4601
22.2	1.29	3.4814
22.4	0.64	3.4974
22.6	0.64	3.508
22.8	1.29	3.524
23	0.64	3.54
23.2	1.29	3.556
23.4	0.64	3.572
23.6	0.64	3.5826
23.8	0.64	3.5932
24	1.29	3.6092

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Job Seneca Bus Park TPM 900-900.138
Sheet No. _____ of _____
Calculated by: ATS Date 3/13/24
Checked by: _____ Date _____
Scale nts

Seneca Bus Park TPM 20841
Adelanto

Table 1: Basin Geometries

Depth	Elevation	Area*	Dvol*	Total V	
ft	ft	sq ft	cf	cf	ac-ft
Basin 1					
0	0	680	0	0	0.000
1	1	1756	1176	1176	0.027
2	2	2605	2167	3343	0.077
3	3	3526	3054	6397	0.147
4	4	4519	4012	10409	0.239
5	5	5,001.0	4758	15167	0.348

$$V = \frac{1}{3}\, h \left(A_1 + A_2 + \sqrt{A_1\, A_2} \right).$$

Detention Basin Outlet Hydraulics

900-900.138
Seneca Bus Park TPM 20841
3/13/2024

Outlet Structure (Weir)		
C	3.3	weir C
C	0.6	orifice C
L (eff)	12	ft
H (eff)	0.50	ft
Bottom EL	0.00	ft

	Outlet Structure (Weir)			Summary					
						Outlet		Total	
Elevation	Head	Orifice Flow Condition	Weir Flow Condition	Elevation		Weir		Outflow	Volume
ft	ft	cfs	cfs	ft		cfs			ac-ft
0	0	0.00	0.00	0		0.00		0.00	0.00
1	1	24.60	39.60	1		24.60		24.60	0.03
2	2	37.58	112.01	2		37.58		37.58	0.08
3	3	47.11	205.77	3		47.11		47.11	0.15
4	4	55.01	316.80	4		55.01		55.01	0.24

Seneca Bus Park TPM 20841

Basin 1

900-900.138

3/13/24

d	Q	S	S-O	S+O
0	0.00	0.00	0	0
1	24.60	0.03	-0.18	0.23
2	37.58	0.08	-0.24	0.39
3	47.11	0.15	-0.25	0.54
4	55.01	0.24	-0.22	0.7
5	61.91	0.35	-0.17	0.86
6	68.12	0.46	-0.1	1.03
7	73.81	0.58	-0.04	1.19

Time	Inflow	d	Qout	S
Hrs	cfs	ft	cfs	ac-ft
	40.21	3.79	26.69	0.220

0	0	0	0	0
0.2	0.64	0.05	0.00	0.001
0.4	0.64	0.05	0.57	0.001
0.6	0.64	0.05	0.56	0.001
0.8	1.29	0.09	0.56	0.002
1	0.64	0.05	1.13	0.001
1.2	1.29	0.09	0.56	0.002
1.4	1.29	0.09	1.13	0.002
1.6	0.64	0.05	1.13	0.001
1.8	1.29	0.09	0.56	0.002
2	0.64	0.05	1.13	0.001
2.2	0.64	0.05	0.56	0.001
2.4	1.29	0.09	0.56	0.002
2.6	1.29	0.09	1.13	0.002
2.8	0.64	0.05	1.13	0.001
3	0.64	0.05	0.56	0.001
3.2	1.29	0.09	0.56	0.002
3.4	1.29	0.09	1.13	0.002
3.6	1.29	0.09	1.13	0.002
3.8	1.29	0.09	1.13	0.002
4	0.64	0.05	1.13	0.001
4.2	1.29	0.09	0.56	0.002
4.4	0.64	0.05	1.13	0.001
4.6	0.64	0.05	0.56	0.001
4.8	1.29	0.09	0.56	0.002
5	0.64	0.05	1.13	0.001

Time	Inflow	d	Qout	S
Hrs	cfs	ft	cfs	ac-ft
5.2	1.29	0.09	0.56	0.002
5.4	1.29	0.09	1.13	0.002
5.6	0.64	0.05	1.13	0.001
5.8	1.29	0.09	0.56	0.002
6	1.29	0.09	1.13	0.002
6.2	1.29	0.09	1.13	0.002
6.4	1.29	0.09	1.13	0.002
6.6	1.29	0.09	1.13	0.002
6.8	1.29	0.09	1.13	0.002
7	1.29	0.09	1.13	0.002
7.2	1.29	0.09	1.13	0.002
7.4	1.29	0.09	1.13	0.002
7.6	1.29	0.09	1.13	0.002
7.8	1.29	0.09	1.13	0.002
8	1.29	0.09	1.13	0.002
8.2	1.29	0.09	1.13	0.002
8.4	1.29	0.09	1.13	0.002
8.6	1.29	0.09	1.13	0.002
8.8	1.29	0.09	1.13	0.002
9	1.29	0.09	1.13	0.002
9.2	1.29	0.09	1.13	0.002
9.4	1.29	0.09	1.13	0.002
9.6	1.29	0.09	1.13	0.002
9.8	1.29	0.09	1.13	0.002
10	1.29	0.09	1.13	0.002
10.2	1.29	0.09	1.13	0.002
10.4	1.29	0.09	1.13	0.002
10.6	1.29	0.09	1.13	0.002
10.8	1.29	0.09	1.13	0.002
11	1.29	0.09	1.13	0.002
11.2	1.29	0.09	1.13	0.002
11.4	1.29	0.09	1.13	0.002
11.6	1.29	0.09	1.13	0.002
11.8	1.29	0.09	1.13	0.002
12	1.29	0.09	1.13	0.002
12.2	1.29	0.09	1.13	0.002
12.4	1.93	0.14	1.13	0.004
12.6	1.29	0.09	1.69	0.002
12.8	1.29	0.09	1.13	0.002
13	1.93	0.14	1.13	0.004
13.2	1.29	0.09	1.69	0.002
13.4	1.93	0.14	1.13	0.004

Time	Inflow	d	Qout	S
Hrs	cfs	ft	cfs	ac-ft
13.6	1.93	0.14	1.69	0.004
13.8	1.93	0.14	1.69	0.004
14	1.93	0.14	1.69	0.004
14.2	2.58	0.18	1.69	0.005
14.4	2.58	0.18	2.26	0.005
14.6	2.58	0.18	2.26	0.005
14.8	3.22	0.23	2.26	0.006
15	3.22	0.23	2.82	0.006
15.2	3.22	0.23	2.82	0.006
15.4	4.51	0.32	2.82	0.009
15.6	3.22	0.23	3.95	0.006
15.8	5.16	0.37	2.82	0.010
16	7.09	0.51	4.52	0.014
16.2	40.21	3.79	6.21	0.220
16.4	3.87	0.28	26.69	0.007
16.6	3.22	0.23	3.39	0.006
16.8	3.22	0.23	2.82	0.006
17	2.58	0.18	2.82	0.005
17.2	2.58	0.18	2.26	0.005
17.4	1.93	0.14	2.26	0.004
17.6	1.93	0.14	1.69	0.004
17.8	1.93	0.14	1.69	0.004
18	1.29	0.09	1.69	0.002
18.2	1.29	0.09	1.13	0.002
18.4	1.29	0.09	1.13	0.002
18.6	1.29	0.09	1.13	0.002
18.8	1.29	0.09	1.13	0.002
19	1.29	0.09	1.13	0.002
19.2	1.29	0.09	1.13	0.002
19.4	1.29	0.09	1.13	0.002
19.6	1.29	0.09	1.13	0.002
19.8	1.29	0.09	1.13	0.002
20	1.29	0.09	1.13	0.002
20.2	1.29	0.09	1.13	0.002
20.4	1.29	0.09	1.13	0.002
20.6	1.29	0.09	1.13	0.002
20.8	0.64	0.05	1.13	0.001
21	1.29	0.09	0.56	0.002
21.2	0.64	0.05	1.13	0.001
21.4	1.29	0.09	0.56	0.002
21.6	1.29	0.09	1.13	0.002
21.8	1.29	0.09	1.13	0.002

Time	Inflow	d	Qout	S
Hrs	cfs	ft	cfs	ac-ft
22	1.29	0.09	1.13	0.002
22.2	1.29	0.09	1.13	0.002
22.4	0.64	0.05	1.13	0.001
22.6	0.64	0.05	0.56	0.001
22.8	1.29	0.09	0.56	0.002
23	0.64	0.05	1.13	0.001
23.2	1.29	0.09	0.56	0.002
23.4	0.64	0.05	1.13	0.001
23.6	0.64	0.05	0.56	0.001
23.8	0.64	0.05	0.56	0.001
24	1.29	0.09	0.56	0.002
24.2	0	0.00	1.13	0.000
24.4	0	0.00	0.00	0.000
24.6	0	0.00	0.00	0.000
24.8	0	0.00	0.00	0.000
25	0	0.00	0.00	0.000
25.2	0	0.00	0.00	0.000
25.4	0	0.00	0.00	0.000
25.6	0	0.00	0.00	0.000
25.8	0	0.00	0.00	0.000
26	0	0.00	0.00	0.000
26.2	0	0.00	0.00	0.000
26.4	0	0.00	0.00	0.000
26.6	0	0.00	0.00	0.000
26.8	0	0.00	0.00	0.000
27	0	0.00	0.00	0.000
27.2	0	0.00	0.00	0.000
27.4	0	0.00	0.00	0.000
27.6	0	0.00	0.00	0.000
27.8	0	0.00	0.00	0.000
28	0	0.00	0.00	0.000
28.2	0	0.00	0.00	0.000
28.4	0	0.00	0.00	0.000
28.6	0	0.00	0.00	0.000
28.8	0	0.00	0.00	0.000
29	0	0.00	0.00	0.000
29.2	0	0.00	0.00	0.000
29.4	0	0.00	0.00	0.000
29.6	0	0.00	0.00	0.000
29.8	0	0.00	0.00	0.000
30	0	0.00	0.00	0.000
30.2	0	0.00	0.00	0.000

Time	Inflow	d	Qout	S
Hrs	cfs	ft	cfs	ac-ft
30.4	0	0.00	0.00	0.000
30.6	0	0.00	0.00	0.000
30.8	0	0.00	0.00	0.000
31	0	0.00	0.00	0.000
31.2	0	0.00	0.00	0.000
31.4	0	0.00	0.00	0.000
31.6	0	0.00	0.00	0.000
31.8	0	0.00	0.00	0.000
32	0	0.00	0.00	0.000
32.2	0	0.00	0.00	0.000
32.4	0	0.00	0.00	0.000
32.6	0	0.00	0.00	0.000
32.8	0	0.00	0.00	0.000
33	0	0.00	0.00	0.000
33.2	0	0.00	0.00	0.000
33.4	0	0.00	0.00	0.000
33.6	0	0.00	0.00	0.000
33.8	0	0.00	0.00	0.000
34	0	0.00	0.00	0.000
34.2	0	0.00	0.00	0.000
34.4	0	0.00	0.00	0.000

Appendix D. Hydraulic Calculations

to be provided at final design