ATTACHMENT G

UDSP EIR 2025 ADDENDUM - APPENDIX F - DRAINAGE REPORT

APPENDIX F

Drainage Report

STEVENS CRESTO ENGINEERS
858.694.5660 • stevenscresto.com

PRELIMINARY DRAINAGE STUDY:

CUBESMART SELF STORAGE

CUP24-0005

SAN MARCOS, CA

Prepared for:
CARMEL ENTERPRISE, LLC.
5550 Carmel Mountain Road, Suite 204
San Diego, CA 92130

Prepared by:
STEVENS CRESTO ENGINEERS
9665 Chesapeake Drive, Suite 200
San Diego, CA 92123

Date: 3/14/2025
SCE Project: 13003.85

STEVENS CRESTO ENGINEERS

858.694.5660 · stevenscresto.com

PRELIMINARY DRAINAGE STUDY:

CUBESMART SELF STORAGE

CUP24-0005

SAN MARCOS, CA

Declaration of Responsible Charge

I hereby declare that I am the Engineer of Work for this project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with current standards.

I understand that the check of project drawings and specifications by the City of San Marcos is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

STEVENS CRESTO ENGINEERS
9665 Chesapeake Drive, Suite 200
San Diego, CA 92123
Tel: (858) 694-5660

3/24/25

Joseph G. Cresto Date

RCE 45601

TABLE OF CONTENTS

SECTION 1

PROJECT DESCRIPTION

Purpose

This study supports the development of the Cubesmart Self Storage project, located along the south side of East Carmel Street, north of Enterprise Street, and east of the North County Transit District's Sprinter light rail system.

The Cubesmart Self Storage project is approximately 2.9 acres and consists of buildings for commercial storage in addition to surface improvements and utilities associated with development. The project proposes two underground detention systems (UD-1 and UD-2) for 100-year peak flow and hydromodification mitigation. This study will calculate flow rates at POC1 (Point of Compliance) to ensure the proposed project flow rates will not exceed pre-project flow rates. See the Project's Storm Water Quality Management Plan (SWQMP) for pollutant control mitigation calculations and requirements.

Hydrologic Soil Group

Per USDA Web Soil Survey, the dominant hydrologic soil group is Type C. See referenced exhibit in Section 3-5.

Rational Method

Runoff generated by the project site is calculated for a 100-year peak design storm, using the Modified Rational Method.

Runoff was calculated using the Modified Rational Method Equation: $Q = C * i * A$

Q = flow rate in cubic feet per second (cfs)
C = runoff coefficient
i = rainfall intensity in inches per hour (in/hr)
A = drainage area in acres (ac)

Modified Rational Method calculations were performed using the Advanced Engineering Software (AES) 2016 computer software. To perform the hydrology routing, the total watershed area was divided into major drainage basins and the primary point of compliance (POC) was identified. The drainage basins were then broken down into smaller drainage areas tributary to a common collection point or POC. The drainage areas were then broken down into smaller sub-basins tributary to specific localized nodes of analysis. Key parameters were then inputted into AES to develop a nodal analysis and calculate project peak runoff flow rates.

Runoff Coefficient

Runoff coefficients were determined for post-project conditions. The runoff coefficients were calculated using Table 3-1 Runoff Coefficient for Urban Areas in SDCHM, which is included in Section 6 for reference. A runoff coefficient of 0.90 was used for fully impervious areas such as roads and drive aisles, and a runoff coefficient of 0.30 was used for fully pervious landscape areas in Soil Group C. Runoff coefficient exhibit and calculations are found in Section 4-3 for post-project.

Rainfall Intensity

The 6-hour and 24-hour precipitation isopluvial maps in the SDCHM are used to determine the 6-hour precipitation (P6) storm duration needed to calculate the rainfall intensity based on Figure 3-1. The project uses a P6 of 3.3 inches for the hydrology analysis. See the Appendices in Section 6 for the references from SDCHM.

Conclusion

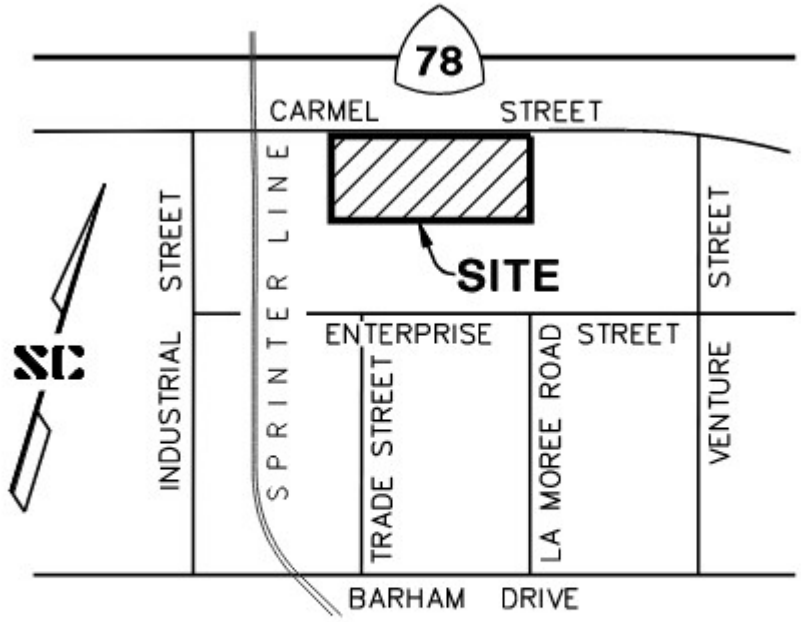
This report provides a hydrologic analysis of the pre-project and post-project condition for the Cubesmart Self Storage project and conforms to the 100-yr peak flow POC 1. For water quality calculations, see the project SWQMP. See Table 1 below for a hydrology summary.

TABLE 1: PROJECT HYDROLOGY SUMMARY

	Existing Condition			Proposed Condition			
OUTFALL	Area (acres)	T_c (min)	Q_{100} (cfs)	Area (acres)	T_c (min)	$Q_{100,UNDETAINED}$ (cfs)	$Q_{100,DETAINED}$ (cfs)
POC 1	2.9	9.8	6.0	2.9	9.9	14.9	5.3

SECTION 2

VICINITY MAP



THOMAS BROTHERS COORD:
PAGE 1128; GRID J1

SECTION 3

PRE-PROJECT HYDROLOGY

The Cubesmart Self Storage project was previously analyzed in studies associated with the Rough Grade Condition Drainage Study for Campus Pointe (Campus Pointe Drainage Study), dated January 2022 and the Precise Grade Condition Drainage Study for Enterprise Affordable Housing, dated September 2024 (GP 24-00021, IP 24-00013). The project is currently composed of a rough graded pad per GP21-00004. The Campus Pointe Drainage Study analyzed the pre-project condition of the project area and established a 10.93 CFS 100-year pre-project flow rate. In the pre-project condition, the 100-year pre-project flow rate consists of 4.91 CFS of run-on from the Enterprise Affordable Housing unit. Therefore a 100-year pre-project flow rate of 6.02 CFS from Cubesmart Self Storage shall be maintained.

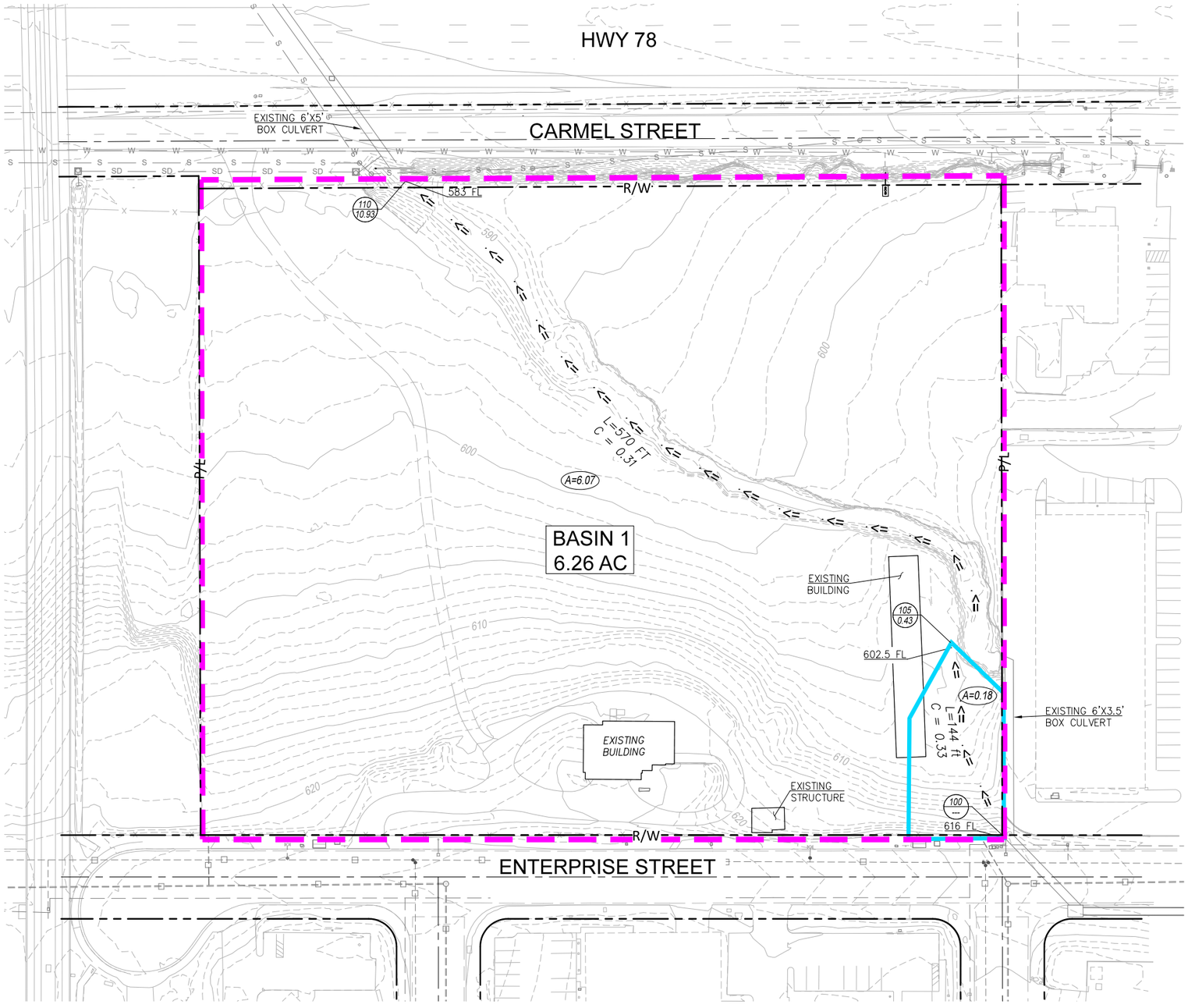
See Section 3 for the exhibit from the approved Drainage Study. The current rough graded condition discharges a total of 10.07 CFS at POC1 and complies with the pre-project flow rate. See Section 3 for the exhibit from the approved Drainage Study. There is 600.8 CFS of run-on that flows through the project via existing double 6'x5' culverts and double 72" RCP storm drains constructed per IP21-00005. Ultimate development will comply with the existing 10.93 CFS pre-project flow rate condition to prevent impact to downstream systems. See Table 2 below for a pre-project hydrology summary.

TABLE 2: PRE-PROJECT HYDROLOGY SUMMARY

	Pre-Project Condition		
OUTFALL	Area (acres)	T_c (min)	Q_{100} (cfs)
POC 1	2.9	9.8	6.0

POC 1 References: Excerpts from the Rough Grade Condition Drainage Study for Campus Pointe, Dated January 2022.

REFERENCED FROM THE ROUGH GRADE CONDITION DRAINAGE STUDY FOR CAMPUS POINTE, DATED JANUARY 2022 FROM PLSA.



LEGEND

DESCRIPTION	SYMBOL
HYDROLOGY NODE Q100 (CFS)	100 1.00
SUB-BASIN AREA	A=0.10
RIGHT-OF-WAY	R/W
PROPERTY LINE	P/L
BASIN BOUNDARY	
SUB-BASIN BOUNDARY	
FLOW PATH	=> =>

HYDROLOGIC SOIL GROUP

HYDROLOGIC SOIL TYPE: C

DEPTH TO GROUNDWATER

DEPTH TO GROUNDWATER ~ 9 FT

PROJECT CHARACTERISTICS

PARCEL AREA:	6.26 AC
EXISTING IMPERVIOUS AREA:	0.14 AC
EXISTING PERVIOUS AREA:	6.12 AC

RUNOFF COEFFICIENT

IN ACCORDANCE WITH COUNTY OF SAN DIEGO STANDARDS, RUNOFF COEFFICIENTS WERE BASED ON LAND USE AND SOIL TYPE. AN APPROPRIATE RUNOFF COEFFICIENT WAS SELECTED FROM TABLE 3-1 OF THE SAN DIEGO COUNTY HYDROLOGY MANUAL AND MULTIPLIED BY THE PERCENTAGE OF TOTAL AREA IN THAT CLASS. THE SUM OF THE PRODUCTS FOR ALL LAND USES IS THE WEIGHTED RUNOFF COEFFICIENT.

FOR THE PURPOSE OF THIS STUDY, THE ENTIRE SITE WAS MODELED WITH TYPE C SOILS.

THE EXISTING SITE IS ASSUMED TO BE 2.2% IMPERVIOUS.

RUNOFF COEFFICIENT FOR 2% IMPERVIOUS, TYPE C SOILS:
SUB-AREA = 0.33
REMAINING BASIN AREA = 0.31

SUMMARY OF EXISTING CONDITION PEAK FLOWS

DRAINAGE BASIN	DRAINAGE AREA (AC)	IMPERVIOUS AREA (AC)	% IMP	WEIGHTED RUNOFF COEFFICIENT, C	100-YEAR PEAK FLOW (CFS)
BASIN 1	6.26	0.14	2.2%	0.31	10.93

GRAPHIC SCALE: 1" = 40'
40 20 0 40 80 120

PASCO LARET SUITER & ASSOCIATES
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EXISTING CONDITION DRAINAGE EXHIBIT

CAMPUS POINTE
SAN MARCOS, CA
PLSA # 2413
NTS
JANUARY 2022

SECTION 3-1

EXHIBIT A-1: PRE-PROJECT DRAINAGE BASINS (REFERENCE)

REFERENCED FROM THE PRECISE GRADE CONDITION DRAINAGE STUDY FOR ENTERPRISE AFFORDABLE HOUSING, DATED SEPTEMBER 2024. (GP 24-00021, IP 24-00013)

POC2
NODE 128
QPRE=4.2 CFS
Q100=3.75 CFS (UNDETAINED)
Q100=1.04 CFS (DETAINED)

S R - 7 8

POC3
NODE 122
QPRE=4.05 CFS
Q100=2.29 CFS

NODE 120 NODE 121 NODE 127 NODE 125 NODE 126

C A R M E L S T R E E T

A9 0.36 A8 0.53

BF-1
PROPOSED UNDERGROUND BIOFILTRATION
(SILVA CELLS OR EQUIVALENT)

PBF-2
PROPRIETARY BIOFILTRATION SYSTEM
(MODULAR WETLANDS OR EQUIVALENT)

NODE 109

POC1
NODE 200
QPRE=10.93 CFS
Q100=26.77 CFS (UNDETAINED)
Q100=10.07 CFS (DETAINED)

A7 2.90

FLOW CONTROL STRUCTURE
NODE 199
QIN=24.28 CFS
QOUT=4.91 CFS

NODE 108 NODE 103

A3 0.31

PBF-1
PROPRIETARY BIOFILTRATION SYSTEM
(MODULAR WETLANDS OR EQUIVALENT)

UD-1
PROPOSED UNDERGROUND DETENTION SYSTEM
(STORMCAPTURE OR EQUIVALENT)

NODE 102

A4 0.24 A6 2.32 A2 0.22

NODE 112 NODE 111 NODE 110 NODE 101 NODE 100

A5 0.11 A1 0.03

T-1
LARGE TREE WELL

T-2
LARGE TREE WELL

E N T E R P R I S E S T R E E T

T R A D E S T R E E T

L A M O R E E R O A D

LEGEND

EXISTING STORM DRAIN

A1 / 0.03 –BASIN DESIGNATION –BASIN AREA (Acres)

DRAINAGE BASIN BOUNDARY

TIME OF CONCENTRATION FLOW PATH

EXISTING CONTOUR 550

PROPOSED CONTOUR 550

RUNOFF FLOW DIRECTION

EXISTING STORM DRAIN

PROPOSED STORM DRAIN

PROPOSED IMPERVIOUS

PROPOSED UNDERGROUND DETENTION SYSTEM (100-YEAR PEAK FLOW & HYDROMODIFICATION MITIGATION) UD-1

PROPOSED PROPRIETARY BIOFILTRATION (POLLUTANT CONTROL) PBF-1

PROPOSED BIOFILTRATION PLANTER (WATER QUALITY, 100-YEAR PEAK FLOW & HYDROMODIFICATION MITIGATION) BF-1

PROPOSED LARGE TREE WELL (POLLUTANT CONTROL) T-1

SCALE 1"=30'

0 15 30 60 90

SCALE: 1"=30'

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CUBESMART SELF STORAGE

SAN MARCOS, CALIFORNIA

EXHIBIT A-1
PRE-PROJECT DRAINAGE BASINS

DATE: 09/12/2024
SCE NO. 13003.85
SHEET A-1
1 OF 1 SHEETS

SECTION 3-2

EXHIBIT A-2: PRE-PROJECT DRAINAGE BASINS

(11” X 17” Reduction)

LEGEND

EXISTING STORM DRAIN

A1 / 2.90 – BASIN DESIGNATION / BASIN AREA (Acres)

DRAINAGE BASIN BOUNDARY

RUNOFF FLOW DIRECTION

EXISTING CONTOUR 600

EXISTING STORM DRAIN

CARMEL STREET

NODE 109
Q=4.91 CFS
A=3.23 AC
TC=9.74 MIN

POC1
NODE 200
QPRE=10.93 CFS
Q100=10.07 CFS (DETAINED)

A1
2.90

NTS

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CUBESMART SELF STORAGE
SAN MARCOS, CALIFORNIA

EXHIBIT A-2
PRE-PROJECT DRAINAGE BASINS

DATE: 01/21/2025
SCE NO. 13003.85
SHEET A-2
1 OF 1 SHEETS

xREDUCED SIZE EXHIBIT. SEE SECTION 7 FOR FULL SIZE EXHIBIT.

SECTION 3-3

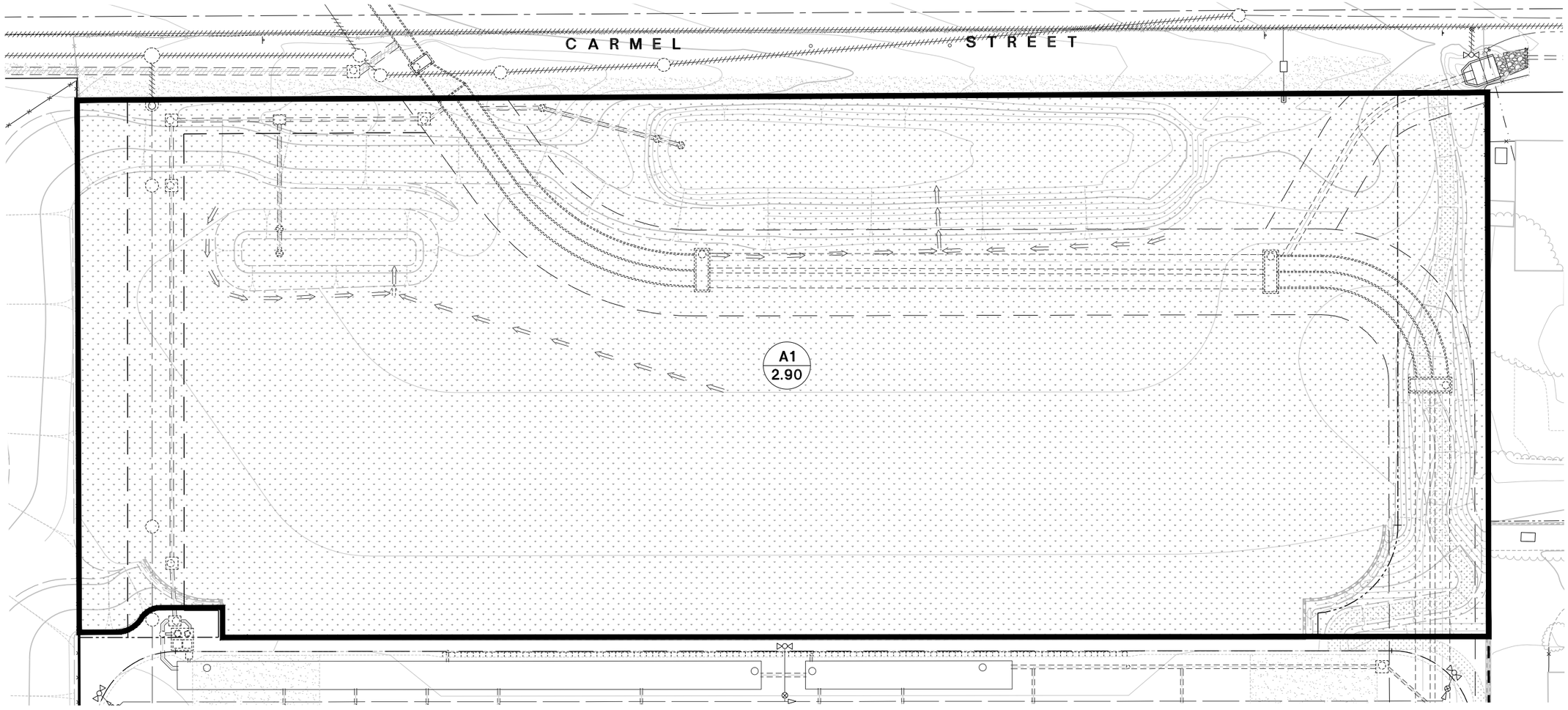
EXHIBIT B: PRE-PROJECT RUNOFF COEFFICIENTS

LEGEND

A1 / 2.90 – BASIN DESIGNATION / BASIN AREA (Acres)

DRAINAGE BASIN BOUNDARY

PERVIOUS AREA (C=0.30)



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CUBESMART SELF STORAGE

SAN MARCOS, CALIFORNIA

EXHIBIT B
PRE-PROJECT RUNOFF COEFFICIENTS

DATE: 01/21/2025

SCE NO. 13003.85

SHEET B

1 OF 1 SHEETS

SECTION 3-4

PRE-PROJECT AES CALCULATIONS

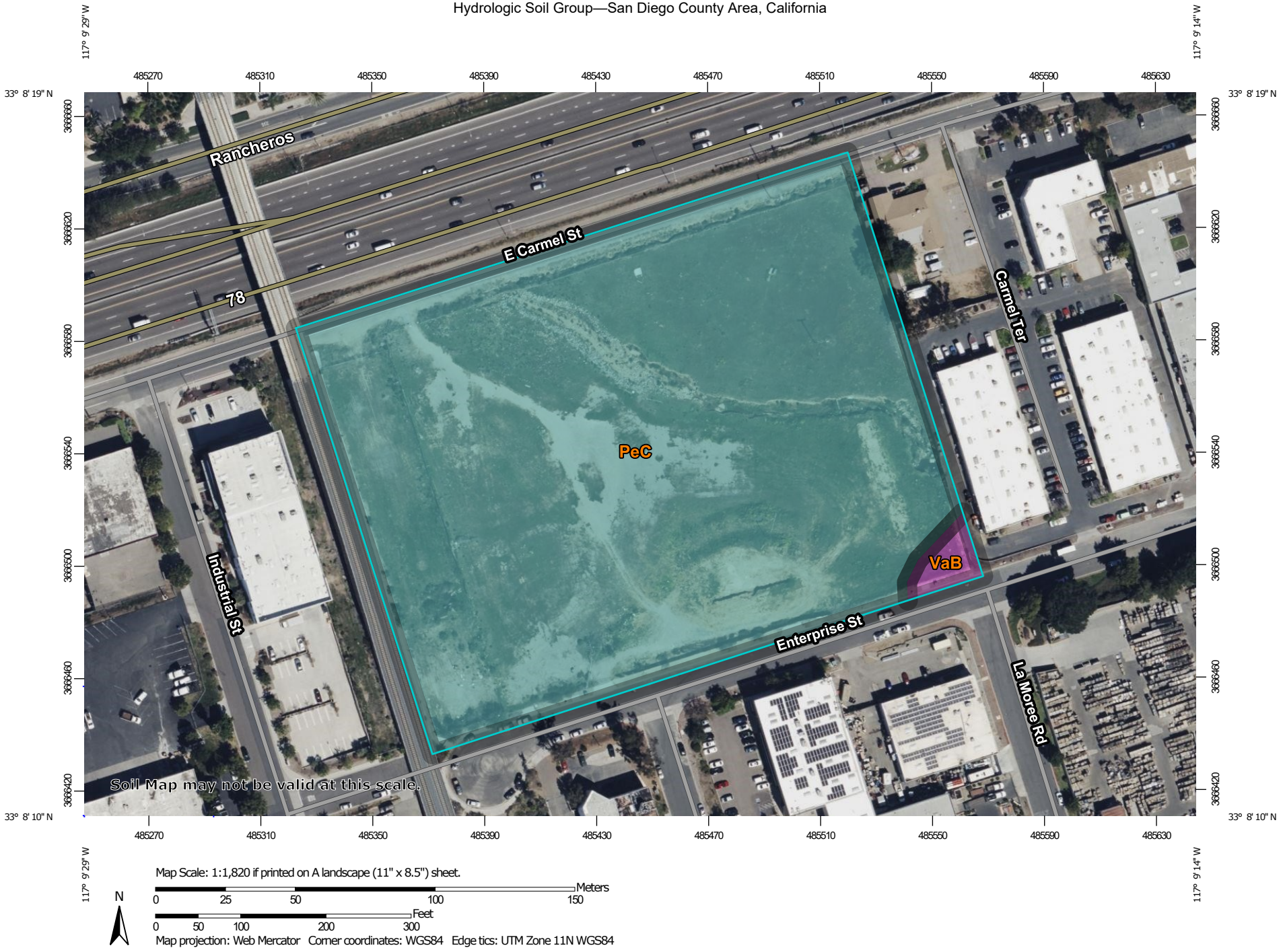
```
_____
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1452

                              Analysis prepared by:

                        PASCO LARET SUITER & ASSOCIATES
                          535 NORTH HIGHWAY 101, STE A
                             SOLANA BEACH, CA 92075
                                  858-259-8212

 ************************** DESCRIPTION OF STUDY **************************
* 2413 CAMPUS POINTE                                                      *
* EXISTING CONDITION                                                      *
* 100-YR                                                                  *
 **************************************************************************

  FILE NAME: 2413E00.DAT
  TIME/DATE OF STUDY: 16:02 02/17/2021
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.300
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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
  2   15.0     10.0    0.020/0.020/0.020   0.50    1.50 0.0100 0.125 0.0180

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

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    105.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   144.00
```

```
  UPSTREAM ELEVATION(FEET) =    616.00
  DOWNSTREAM ELEVATION(FEET) =    602.50
  ELEVATION DIFFERENCE(FEET) =     13.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.574
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.288
  SUBAREA RUNOFF(CFS) =      0.43
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    602.50  DOWNSTREAM(FEET) =    583.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   570.00   CHANNEL SLOPE =  0.0342
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =  10.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.632
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3100
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.94
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =    9.80
  SUBAREA AREA(ACRES) =     6.07       SUBAREA RUNOFF(CFS) =   10.60
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.311
  TOTAL AREA(ACRES) =        6.3         PEAK FLOW RATE(CFS) =      10.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   3.64
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     714.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.3  TC(MIN.) =      9.80
  PEAK FLOW RATE(CFS)   =       10.93
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

QPRE-PROJECT

SECTION 3-5

HYDROLOGIC SOIL GROUP



Map Scale: 1:1,820 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 19, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 14, 2022—Mar 17, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	8.0	98.7%
VaB	Visalia sandy loam, 2 to 5 percent slopes	A	0.1	1.3%
Totals for Area of Interest			**8.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

SECTION 4

POST-PROJECT HYDROLOGY

The Cubesmart Self Storage post-project condition maintains pre-project drainage patterns and flow rates. Flow generated onsite will be captured and conveyed via a private storm drain system into the proposed underground detention systems UD-1 and UD-2. UD-1 and UD-2 will provide 100-year design flow mitigation for POC 1.

The analysis in this section demonstrates that peak flow rate generated by the proposed project is in conformance with the pre-project flow rate. This analysis is conceptual and simplified for a discretionary purpose. At final engineering, a detailed analysis will be provided. See Table 4 below for the post-project hydrology summary.

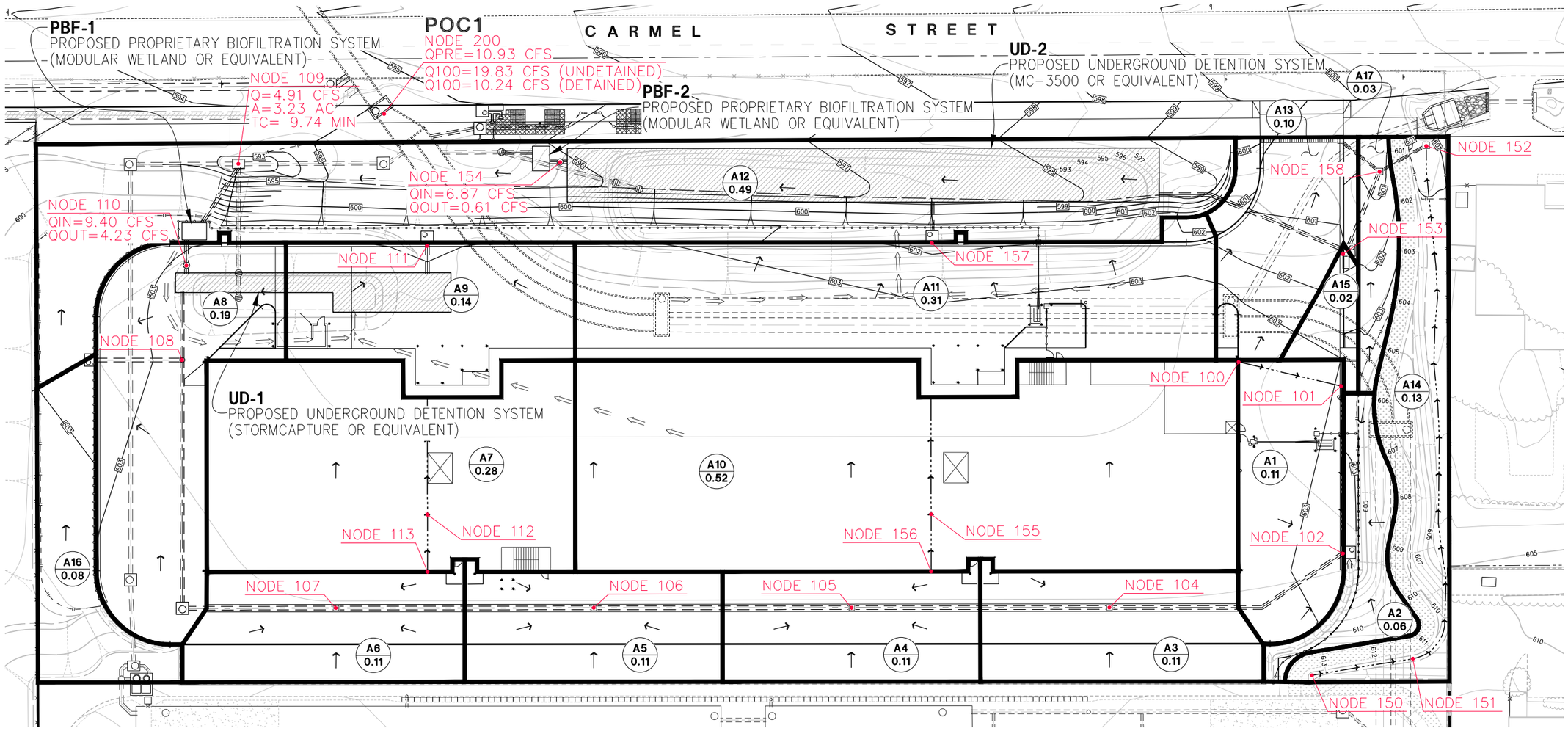
TABLE 4: POST-PROJECT HYDROLOGY SUMMARY

	Post-Project Condition			
OUTFALL	Area (acres)	Tc (min)	$Q_{100,UNDETAINED}$ (cfs)	$Q_{100,DETAINED}$ (cfs)
POC 1	2.9	9.9	14.9	5.3

SECTION 4-1

EXHIBIT C – POST-PROJECT DRAINAGE BASINS

(11” X 17” REDUCTION)



LEGEND

A1 / 0.11 – BASIN DESIGNATION / BASIN AREA (ACRES)

- DRAINAGE BASIN BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- EXISTING CONTOUR (600)
- PROPOSED CONTOUR (600)
- RUNOFF FLOW DIRECTION
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN

PROPOSED BMPs

- PROPOSED UNDERGROUND DETENTION SYSTEM (100-YEAR PEAK FLOW & HYDROMODIFICATION MITIGATION) — UD-1
- PROPOSED PROPRIETARY BIOFILTRATION SYSTEM (WATER QUALITY) — PBF-1

NTS

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858.694.5660 stevenscresto.com

CUBESMART SELF STORAGE

SAN MARCOS, CALIFORNIA

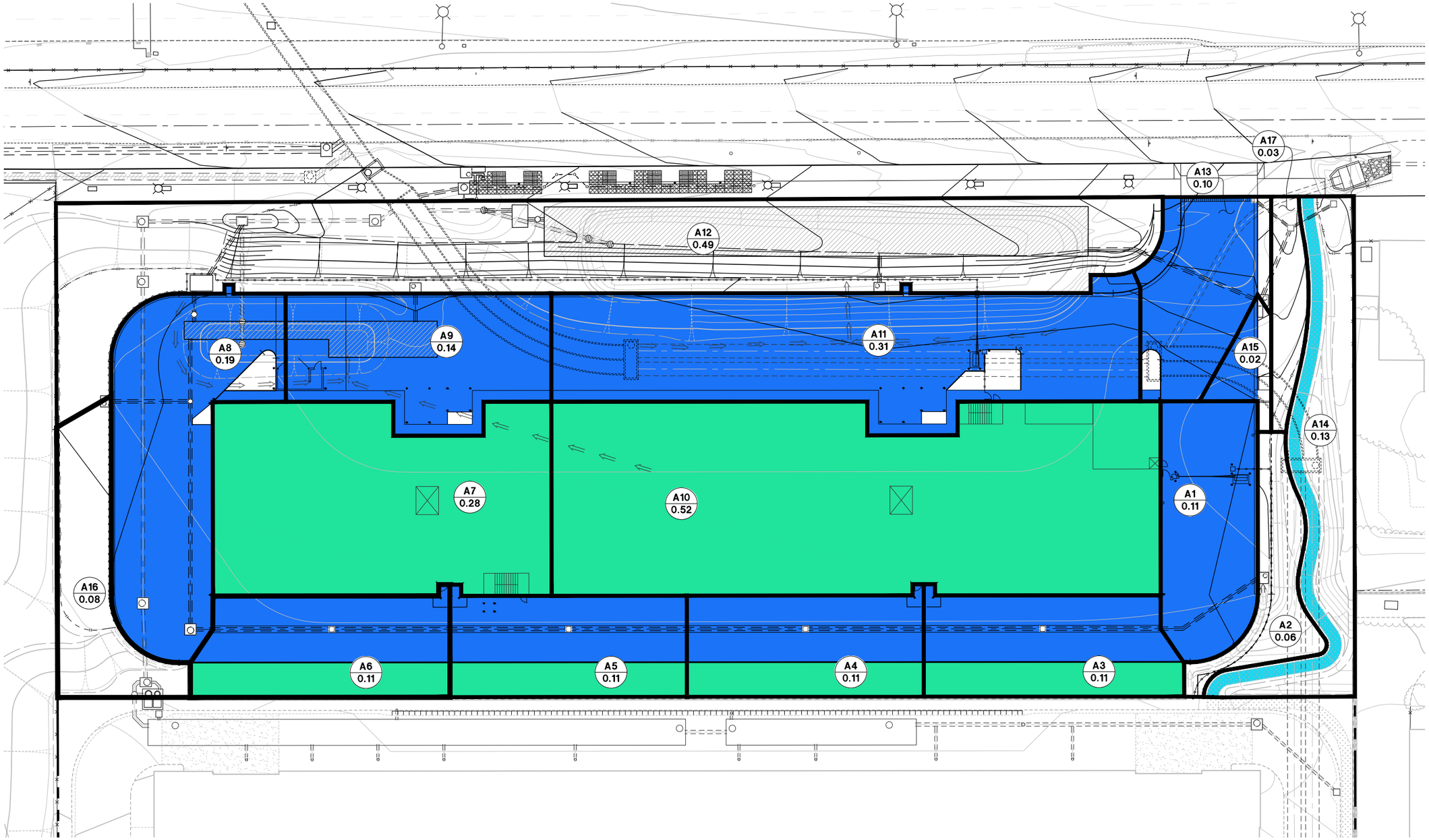
EXHIBIT C
POST-PROJECT DRAINAGE BASINS

DATE: 03/24/2025
SCE NO. 13003.85
SHEET C
1 OF 1 SHEETS

xREDUCED SIZE EXHIBIT. SEE SECTION 7 FOR FULL SIZE EXHIBIT.

SECTION 4-2

EXHIBIT D: POST-PROJECT RUNOFF COEFFICIENTS



LEGEND

A1 / 0.11 – BASIN DESIGNATION / BASIN AREA (Acres)

- DRAINAGE BASIN BOUNDARY
- PROPOSED IMPERVIOUS (C=0.90)
- PROPOSED BUILDING (C=0.90)
- DG (C=0.30)
- PERVIOUS (C=0.30)

NTS

STEVENS CRESTO ENGINEERS
9665 Chesapeake Dr. Ste 200
San Diego, CA 92123
858.694.5660 stevenscresto.com

CUBESMART SELF STORAGE

SAN MARCOS, CALIFORNIA

EXHIBIT D
POST-PROJECT RUNOFF COEFFICIENTS

DATE: 03/24/2025

SCE NO. 13003.85

SHEET D

1 OF 1 SHEETS

C-VALUE DETERMINATION					
Basin	**A_T (Ac.)**	**$A_{0.90}$ (Ac.)**	**$A_{0.30}$(Ac.)**	**C**	**Remarks**
A1	0.11	0.11		0.90	Impervious Surface
A2	0.06		0.06	0.30	Pervious Surface
A3	0.11	0.11		0.90	Impervious Surface
A4	0.11	0.11		0.90	Impervious Surface
A5	0.11	0.11		0.90	Impervious Surface
A6	0.11	0.11		0.90	Impervious Surface
A7	0.28	0.28		0.90	Building
A8	0.19	0.19	0.01	0.88	Mixed Land Use
A9	0.14	0.14	0.00	0.89	Mixed Land Use
A10	0.52	0.52		0.90	Building
A11	0.31	0.30	0.01	0.88	Mixed Land Use
A12	0.49		0.49	0.30	Pervious Surface
A13	0.10	0.09	0.01	0.86	Mixed Land Use
A14	0.13		0.13	0.30	Pervious Surface
A15	0.02	0.01	0.01	0.68	Mixed Land Use
A16	0.08		0.08	0.30	Pervious Surface
A17	0.03		0.03	0.30	Pervious Surface
TOTAL	2.90	WEIGHTED AVG:		0.73	

Assumptions:

1) Three land use types exist on site:
   Impervious Surface (C-Value = 0.90)
   Pervious Surface (C-Value = 0.30)
2) C-Values have been determined using Table 3-1 from the San Diego County

SECTION 4-3

POST-PROJECT AES CALCULATIONS

UNDETAINED HYDROLOGY ROUTING – POC 1

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1662

                              Analysis prepared by:

                          STEVENS CRESTO ENGINEERING, INC.
                          9665 CHESAPEAKE DRIVE, SUITE 200
                                SAN DIEGO, CA 92123
                        PH: 858.694.5660  FAX: 858.694.5661

 ************************** DESCRIPTION OF STUDY **************************
* CUBESMART SELF STORAGE                                                  *
* POSTPROJECT HYDROLOGY POC1                                              *
* 100YR DESIGN STORM - UNDETAINED                                         *
 **************************************************************************

  FILE NAME: CUBEPOSU.DAT
  TIME/DATE OF STUDY: 09:06 01/21/2025
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.300
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    603.98
  DOWNSTREAM ELEVATION(FEET) =    602.90
```

```
 ELEVATION DIFFERENCE(FEET) =      1.08
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.969
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0280
 STREET LENGTH(FEET) =    65.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 43.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  38.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.63
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    3.44
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.52
 STREET FLOW TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =    2.38
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 SUBAREA AREA(ACRES) =    0.06      SUBAREA RUNOFF(CFS) =    0.47
 TOTAL AREA(ACRES) =        0.1        PEAK FLOW RATE(CFS) =       0.86

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.43
 FLOW VELOCITY(FEET/SEC.) =  2.74   DEPTH*VELOCITY(FT*FT/SEC.) =   0.59
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     115.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6882
 SUBAREA AREA(ACRES) =    0.06   SUBAREA RUNOFF(CFS) =    0.16
 TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.02
```

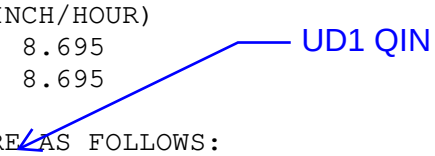
```
  TC(MIN.) =    2.38

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   101.29   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.56
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.02
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    2.85
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     216.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7714
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       1.88
  TC(MIN.) =    2.85

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   102.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.24
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.88
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    3.26
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     318.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8077
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.4   TOTAL RUNOFF(CFS) =       2.74
```

```
  TC(MIN.) =    3.26

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   102.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.72
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.74
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    3.62
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     421.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8280
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       3.60
  TC(MIN.) =    3.62

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   102.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.08
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.60
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    3.96
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =     524.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8410
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       4.46
```

```
  TC(MIN.) =    3.96

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   148.49   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.37
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.46
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =    4.42
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     672.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7783
  SUBAREA AREA(ACRES) =    0.08   SUBAREA RUNOFF(CFS) =    0.21
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.67
  TC(MIN.) =    4.42

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8002
  SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    1.45
  TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       6.12
  TC(MIN.) =    4.42

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    41.85   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.80
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.12
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    4.54
```

```
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     714.64 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 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.) =    4.54
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =     0.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.12

****************************************************************************
 FLOW PROCESS FROM NODE    113.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
 UPSTREAM ELEVATION(FEET) =    604.50
 DOWNSTREAM ELEVATION(FEET) =    604.00
 ELEVATION DIFFERENCE(FEET) =      0.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.546
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    111.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0100
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.41
 AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   0.83
 Tc(MIN.) =    3.38
 SUBAREA AREA(ACRES) =     0.23       SUBAREA RUNOFF(CFS) =    1.80
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       2.19

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.56
 LONGEST FLOWPATH FROM NODE    113.00 TO NODE    111.00 =     120.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    111.00 TO NODE    111.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8967
 SUBAREA AREA(ACRES) =    0.14   SUBAREA RUNOFF(CFS) =    1.08
 TOTAL AREA(ACRES) =       0.4   TOTAL RUNOFF(CFS) =       3.27
 TC(MIN.) =    3.38

****************************************************************************
 FLOW PROCESS FROM NODE    111.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    11.25   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.95
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.27
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    3.41
 LONGEST FLOWPATH FROM NODE    113.00 TO NODE    110.00 =     131.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 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.) =    3.41
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =     0.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.27

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        6.12     4.54        8.695          0.88
     2        3.27     3.41        8.695          0.42

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        7.88     3.41       8.695
     2        9.40     4.54       8.695

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.40   Tc(MIN.) =    4.54
 TOTAL AREA(ACRES) =        1.3
```



```
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     714.64 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    109.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    26.87   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.24
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.40
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    4.61
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =     741.51 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6859
 SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    1.28
 TOTAL AREA(ACRES) =       1.8   TOTAL RUNOFF(CFS) =     10.68
 TC(MIN.) =    4.61

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 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.) =    4.61
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =     1.79
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.68

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   9.74   RAIN INTENSITY(INCH/HOUR) =  5.66
 TOTAL AREA(ACRES) =     3.23   TOTAL RUNOFF(CFS) =      4.91

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
```

RUNON FROM ENTERPRISE AFFORDABLE HOUSING

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.74
  RAINFALL INTENSITY(INCH/HR) =   5.66
  TOTAL STREAM AREA(ACRES) =     3.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.68     4.61        8.695          1.79
      2        4.91     9.74        5.655          3.23

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       13.00     4.61       8.695
      2       11.85     9.74       5.655

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.00   Tc(MIN.) =    4.61
  TOTAL AREA(ACRES) =        5.0
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =     741.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    62.56   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.36
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.00
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    4.75
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    200.00 =     804.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    55.00
  UPSTREAM ELEVATION(FEET) =    614.50
  DOWNSTREAM ELEVATION(FEET) =    611.50
  ELEVATION DIFFERENCE(FEET) =      3.00
```

```
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.067
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.675
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   197.40
 REPRESENTATIVE CHANNEL SLOPE =  0.0320
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.963
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.20
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.33
 AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   0.99
 Tc(MIN.) =    7.05
 SUBAREA AREA(ACRES) =     0.08       SUBAREA RUNOFF(CFS) =    0.17
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
 TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.27

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   3.55
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    152.00 =     252.40 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    152.00 TO NODE    158.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    21.81   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.43
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.27
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    7.20
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    158.00 =     274.21 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    158.00 TO NODE    158.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.870
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    0.03   SUBAREA RUNOFF(CFS) =    0.06
 TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       0.33
 TC(MIN.) =    7.20
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    158.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.870
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5154
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.59
  TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       0.92
  TC(MIN.) =    7.20

****************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    153.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    32.47   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.44
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.92
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.36
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     306.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.775
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .6800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5271
  SUBAREA AREA(ACRES) =    0.02   SUBAREA RUNOFF(CFS) =    0.09
  TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       1.00
  TC(MIN.) =    7.36

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    65.86   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.54
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.00
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    7.67
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     372.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 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.) =    7.67
  RAINFALL INTENSITY(INCH/HR) =   6.60
  TOTAL STREAM AREA(ACRES) =     0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    155.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    604.50
  DOWNSTREAM ELEVATION(FEET) =    604.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.546
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    157.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    71.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0100
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.59
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   0.75
  Tc(MIN.) =    3.29
  SUBAREA AREA(ACRES) =     0.47       SUBAREA RUNOFF(CFS) =    3.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       4.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   1.83
  LONGEST FLOWPATH FROM NODE    156.00 TO NODE    157.00 =     121.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    157.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8925
 SUBAREA AREA(ACRES) =    0.31   SUBAREA RUNOFF(CFS) =    2.37
 TOTAL AREA(ACRES) =       0.8   TOTAL RUNOFF(CFS) =       6.44
 TC(MIN.) =    3.29

****************************************************************************
 FLOW PROCESS FROM NODE    157.00 TO NODE    154.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    12.28   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.86
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.44
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    3.33
 LONGEST FLOWPATH FROM NODE    156.00 TO NODE    154.00 =     133.28 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 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.) =    3.33
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =     0.83
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.44

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        1.00     7.67        6.597          0.28
     2        6.44     3.33        8.695          0.83

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        6.87     3.33       8.695
     2        5.89     7.67       6.597

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       6.87   Tc(MIN.) =    3.33
 TOTAL AREA(ACRES) =        1.1
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     372.54 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    200.00 IS CODE =  41
```

UD2 QIN

```
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
========================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    44.14   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.95
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.87
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    3.45
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    200.00 =     416.68 FEET.

************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  11
------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        6.87     3.45       8.695        1.11
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    200.00 =     416.68 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       13.00     4.75       8.695        5.02
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    200.00 =     804.07 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      16.32       3.45        8.695
      2      19.87       4.75        8.695

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.87   Tc(MIN.) =    4.75
  TOTAL AREA(ACRES) =        6.1
========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.1  TC(MIN.) =      4.75
  PEAK FLOW RATE(CFS)   =      19.87
========================================================================
========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Q UNDETAINED
POC1

DETAINED HYDROLOGY ROUTING – POC 1

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1662

                              Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* CUBESMART SELF STORAGE                                                  *
* POSTPROJECT HYDROLOGY POC1                                              *
* 100YR DESIGN STORM - DETAINED                                           *
 **************************************************************************

  FILE NAME: CUBEPOSD.DAT
  TIME/DATE OF STUDY: 13:40 01/21/2025
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.300
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    603.98
  DOWNSTREAM ELEVATION(FEET) =    602.90
```

```
 ELEVATION DIFFERENCE(FEET) =      1.08
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.969
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0280
 STREET LENGTH(FEET) =    65.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 43.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  38.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.63
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    3.44
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.52
 STREET FLOW TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =    2.38
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 SUBAREA AREA(ACRES) =    0.06      SUBAREA RUNOFF(CFS) =    0.47
 TOTAL AREA(ACRES) =        0.1        PEAK FLOW RATE(CFS) =       0.86

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.43
 FLOW VELOCITY(FEET/SEC.) =  2.74   DEPTH*VELOCITY(FT*FT/SEC.) =   0.59
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     115.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6882
 SUBAREA AREA(ACRES) =    0.06   SUBAREA RUNOFF(CFS) =    0.16
 TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.02
```

```
  TC(MIN.) =    2.38

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   101.29   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.56
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.02
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    2.85
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     216.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7714
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       1.88
  TC(MIN.) =    2.85

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   102.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.24
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.88
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    3.26
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     318.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8077
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.4   TOTAL RUNOFF(CFS) =       2.74
```

```
  TC(MIN.) =    3.26

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   102.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.72
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.74
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    3.62
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =     421.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8280
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       3.60
  TC(MIN.) =    3.62

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   102.67   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.08
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.60
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    3.96
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =     524.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8410
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.86
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       4.46
```

```
  TC(MIN.) =    3.96

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   148.49   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.37
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.46
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =    4.42
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =     672.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7783
  SUBAREA AREA(ACRES) =    0.08   SUBAREA RUNOFF(CFS) =    0.21
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.67
  TC(MIN.) =    4.42

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8002
  SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    1.45
  TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       6.12
  TC(MIN.) =    4.42

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    41.85   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.80
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.12
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    4.54
```

```
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     714.64 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 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.) =    4.54
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =     0.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.12

****************************************************************************
 FLOW PROCESS FROM NODE    113.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
 UPSTREAM ELEVATION(FEET) =    604.50
 DOWNSTREAM ELEVATION(FEET) =    604.00
 ELEVATION DIFFERENCE(FEET) =      0.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.546
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    111.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0100
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.41
 AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   0.83
 Tc(MIN.) =    3.38
 SUBAREA AREA(ACRES) =     0.23       SUBAREA RUNOFF(CFS) =    1.80
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
 TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       2.19

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.56
 LONGEST FLOWPATH FROM NODE    113.00 TO NODE    111.00 =     120.00 FEET.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    111.00 TO NODE    111.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8967
 SUBAREA AREA(ACRES) =    0.14   SUBAREA RUNOFF(CFS) =    1.08
 TOTAL AREA(ACRES) =       0.4   TOTAL RUNOFF(CFS) =      3.27
 TC(MIN.) =    3.38

****************************************************************************
 FLOW PROCESS FROM NODE    111.00 TO NODE    110.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    11.25   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.95
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.27
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    3.41
 LONGEST FLOWPATH FROM NODE    113.00 TO NODE    110.00 =     131.25 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 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.) =    3.41
 RAINFALL INTENSITY(INCH/HR) =   8.69
 TOTAL STREAM AREA(ACRES) =     0.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.27

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        6.12     4.54        8.695          0.88
     2        3.27     3.41        8.695          0.42

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        7.88     3.41       8.695
     2        9.40     4.54       8.695

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.40   Tc(MIN.) =    4.54
 TOTAL AREA(ACRES) =        1.3
```

QIN UD1

```
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     714.64 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   9.54   RAIN INTENSITY(INCH/HOUR) =  5.73
 TOTAL AREA(ACRES) =     1.30   TOTAL RUNOFF(CFS) =      4.23

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    109.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    26.87   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.30
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.23
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.62
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =     741.51 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.699
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4944
 SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    0.84
 TOTAL AREA(ACRES) =       1.8   TOTAL RUNOFF(CFS) =      5.04
 TC(MIN.) =    9.62

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 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.) =    9.62
 RAINFALL INTENSITY(INCH/HR) =   5.70
 TOTAL STREAM AREA(ACRES) =     1.79
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.04

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   9.74   RAIN INTENSITY(INCH/HOUR) =  5.66
 TOTAL AREA(ACRES) =     3.23   TOTAL RUNOFF(CFS) =      4.91
```

QOUT UD1

RUNON FROM ENTERPRISE AFFORDABLE HOUSING

```
****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 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.) =    9.74
  RAINFALL INTENSITY(INCH/HR) =   5.66
  TOTAL STREAM AREA(ACRES) =     3.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.04     9.62        5.699          1.79
      2        4.91     9.74        5.655          3.23

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.90     9.62       5.699
      2        9.92     9.74       5.655

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.92   Tc(MIN.) =    9.74
  TOTAL AREA(ACRES) =        5.0
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =     741.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    62.56   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.61
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.92
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    9.93
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    200.00 =     804.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    55.00
  UPSTREAM ELEVATION(FEET) =    614.50
  DOWNSTREAM ELEVATION(FEET) =    611.50
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.067
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.675
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.12

**************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   197.40
  REPRESENTATIVE CHANNEL SLOPE =  0.0320
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.963
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.33
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   0.99
  Tc(MIN.) =    7.05
  SUBAREA AREA(ACRES) =     0.08       SUBAREA RUNOFF(CFS) =    0.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   3.55
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    152.00 =     252.40 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    158.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    21.81   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.43
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.27
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    7.20
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    158.00 =     274.21 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    158.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.870
```

```
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =    0.03   SUBAREA RUNOFF(CFS) =    0.06
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       0.33
  TC(MIN.) =    7.20

****************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    158.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.870
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5154
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.59
  TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       0.92
  TC(MIN.) =    7.20

****************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    153.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    32.47   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.44
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.92
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.36
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     306.68 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.775
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .6800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5271
  SUBAREA AREA(ACRES) =    0.02   SUBAREA RUNOFF(CFS) =    0.09
  TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       1.00
  TC(MIN.) =    7.36

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    65.86   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.54
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.00
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    7.67
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     372.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 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.) =    7.67
  RAINFALL INTENSITY(INCH/HR) =   6.60
  TOTAL STREAM AREA(ACRES) =     0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.00

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    155.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    604.50
  DOWNSTREAM ELEVATION(FEET) =    604.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.546
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    157.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    71.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0100
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .9000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.59
  AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   0.75
  Tc(MIN.) =    3.29
  SUBAREA AREA(ACRES) =     0.47       SUBAREA RUNOFF(CFS) =    3.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.900
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       4.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

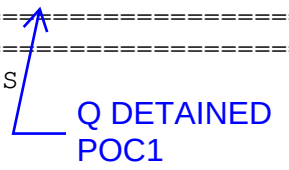
```
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   1.83
  LONGEST FLOWPATH FROM NODE    156.00 TO NODE    157.00 =     121.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    157.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.695
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8925
  SUBAREA AREA(ACRES) =    0.31   SUBAREA RUNOFF(CFS) =    2.37
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       6.44
  TC(MIN.) =    3.29

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    154.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    12.28   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.86
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.44
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    3.33
  LONGEST FLOWPATH FROM NODE    156.00 TO NODE    154.00 =     133.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 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.) =    3.33
  RAINFALL INTENSITY(INCH/HR) =   8.69
  TOTAL STREAM AREA(ACRES) =     0.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.44

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.00     7.67        6.597          0.28
      2        6.44     3.33        8.695          0.83

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.87     3.33       8.695
      2        5.89     7.67       6.597
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       6.87   Tc(MIN.) =    3.33
 TOTAL AREA(ACRES) =        1.1
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     372.54 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  18.33   RAIN INTENSITY(INCH/HOUR) =  3.76
 TOTAL AREA(ACRES) =     1.11   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    44.14   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.07
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.61
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   18.57
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    200.00 =     416.68 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    200.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        0.61    18.57       3.730        1.11
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    200.00 =     416.68 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        9.92     9.93       5.587        5.02
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    200.00 =     804.07 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      10.24       9.93        5.587
     2       7.23      18.57        3.730

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      10.24   Tc(MIN.) =    9.93
 TOTAL AREA(ACRES) =        6.1
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        6.1  TC(MIN.) =      9.93
```

QIN UD2

QOUT UD2

```
  PEAK FLOW RATE(CFS)    =       10.24
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```



SECTION 5

PRELIMINARY DETENTION ROUTING

Description

This section provides detention calculations to ensure the post-project flow rate is not exceeded by the proposed development.

Calculations

1. GENERATE RATIONAL METHOD PEAK FLOW

See routing calculations in Section 4.

2. GENERATE INFLOW HYDROGRAPH UTILIZING "RATHYDRO":

The "Rational Method Hydrograph Program" by Rick Engineering Company, supplied by the County of San Diego, has been utilized to determine the developed "inflow" hydrograph, utilizing parameters at the outfall points for each of the regional detention facility. The parameters for the inflow hydrograph are the Rational Method weighted runoff coefficient, time of concentration, peak flow, six-hour precipitation and tributary basin area.

3. ROUTE INFLOW HYDROGRAPHS THROUGH DETENTION FACILITIES:

The software utilized to route the inflow hydrograph through the detention facility is Hydraflow Hydrographs Extension for Autodesk Civil 3D 2023. The facility is modeled in the software using contour areas and outlet structure parameters, which have been iteratively adjusted to satisfy the mitigation criteria. The software generates an outflow hydrograph for the facility and a graphic output that depicts the hydraulic operation of the outlet structure; Hydrograph Reports and Pond Reports for the facility follow in this section.

Detention Conclusion

As shown in the routing calculations within Section 4 and summarized in the following table within this section, the proposed detention facility will adequately mitigate for the increase in runoff from a 100-year design storm so that runoff generated by the project does not exceed the pre-project peak flow rate. See the following Table 5 for the detention summary.

TABLE 5: DETENTION SUMMARY

	Detention Summary					
OUTFALL	Area (acres)	Tc_{in} (min)	Qin (cfs)	Tc_{out} (min)	Qout (cfs)	WSE (ft)
UD-1	1.3	4.5	9.4	9.5	4.2	5.6
UD-2	1.1	3.3	6.9	18.3	0.6	3.7

UD1 INFLOW

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 1/16/2025
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 1.3 ACRES
RUNOFF COEFFICIENT 0.84
PEAK DISCHARGE 9.4 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.2
TIME (MIN) = 10	DISCHARGE (CFS) = 0.2
TIME (MIN) = 15	DISCHARGE (CFS) = 0.2
TIME (MIN) = 20	DISCHARGE (CFS) = 0.2
TIME (MIN) = 25	DISCHARGE (CFS) = 0.2
TIME (MIN) = 30	DISCHARGE (CFS) = 0.2
TIME (MIN) = 35	DISCHARGE (CFS) = 0.2
TIME (MIN) = 40	DISCHARGE (CFS) = 0.2
TIME (MIN) = 45	DISCHARGE (CFS) = 0.2
TIME (MIN) = 50	DISCHARGE (CFS) = 0.2
TIME (MIN) = 55	DISCHARGE (CFS) = 0.2
TIME (MIN) = 60	DISCHARGE (CFS) = 0.3
TIME (MIN) = 65	DISCHARGE (CFS) = 0.3
TIME (MIN) = 70	DISCHARGE (CFS) = 0.3
TIME (MIN) = 75	DISCHARGE (CFS) = 0.3
TIME (MIN) = 80	DISCHARGE (CFS) = 0.3
TIME (MIN) = 85	DISCHARGE (CFS) = 0.3
TIME (MIN) = 90	DISCHARGE (CFS) = 0.3
TIME (MIN) = 95	DISCHARGE (CFS) = 0.3
TIME (MIN) = 100	DISCHARGE (CFS) = 0.3
TIME (MIN) = 105	DISCHARGE (CFS) = 0.3
TIME (MIN) = 110	DISCHARGE (CFS) = 0.3
TIME (MIN) = 115	DISCHARGE (CFS) = 0.3
TIME (MIN) = 120	DISCHARGE (CFS) = 0.3
TIME (MIN) = 125	DISCHARGE (CFS) = 0.3
TIME (MIN) = 130	DISCHARGE (CFS) = 0.3
TIME (MIN) = 135	DISCHARGE (CFS) = 0.4
TIME (MIN) = 140	DISCHARGE (CFS) = 0.4
TIME (MIN) = 145	DISCHARGE (CFS) = 0.4
TIME (MIN) = 150	DISCHARGE (CFS) = 0.4
TIME (MIN) = 155	DISCHARGE (CFS) = 0.4
TIME (MIN) = 160	DISCHARGE (CFS) = 0.4
TIME (MIN) = 165	DISCHARGE (CFS) = 0.4
TIME (MIN) = 170	DISCHARGE (CFS) = 0.5
TIME (MIN) = 175	DISCHARGE (CFS) = 0.5
TIME (MIN) = 180	DISCHARGE (CFS) = 0.5
TIME (MIN) = 185	DISCHARGE (CFS) = 0.5
TIME (MIN) = 190	DISCHARGE (CFS) = 0.6
TIME (MIN) = 195	DISCHARGE (CFS) = 0.6
TIME (MIN) = 200	DISCHARGE (CFS) = 0.6
TIME (MIN) = 205	DISCHARGE (CFS) = 0.7
TIME (MIN) = 210	DISCHARGE (CFS) = 0.7
TIME (MIN) = 215	DISCHARGE (CFS) = 0.8
TIME (MIN) = 220	DISCHARGE (CFS) = 0.9
TIME (MIN) = 225	DISCHARGE (CFS) = 1.1
TIME (MIN) = 230	DISCHARGE (CFS) = 1.3
TIME (MIN) = 235	DISCHARGE (CFS) = 1.9
TIME (MIN) = 240	DISCHARGE (CFS) = 2.7
TIME (MIN) = 245	DISCHARGE (CFS) = 9.4
TIME (MIN) = 250	DISCHARGE (CFS) = 1.5
TIME (MIN) = 255	DISCHARGE (CFS) = 1
TIME (MIN) = 260	DISCHARGE (CFS) = 0.8
TIME (MIN) = 265	DISCHARGE (CFS) = 0.7
TIME (MIN) = 270	DISCHARGE (CFS) = 0.6
TIME (MIN) = 275	DISCHARGE (CFS) = 0.5
TIME (MIN) = 280	DISCHARGE (CFS) = 0.5
TIME (MIN) = 285	DISCHARGE (CFS) = 0.4
TIME (MIN) = 290	DISCHARGE (CFS) = 0.4
TIME (MIN) = 295	DISCHARGE (CFS) = 0.4
TIME (MIN) = 300	DISCHARGE (CFS) = 0.3
TIME (MIN) = 305	DISCHARGE (CFS) = 0.3
TIME (MIN) = 310	DISCHARGE (CFS) = 0.3
TIME (MIN) = 315	DISCHARGE (CFS) = 0.3
TIME (MIN) = 320	DISCHARGE (CFS) = 0.3
TIME (MIN) = 325	DISCHARGE (CFS) = 0.3
TIME (MIN) = 330	DISCHARGE (CFS) = 0.3
TIME (MIN) = 335	DISCHARGE (CFS) = 0.3
TIME (MIN) = 340	DISCHARGE (CFS) = 0.2
TIME (MIN) = 345	DISCHARGE (CFS) = 0.2
TIME (MIN) = 350	DISCHARGE (CFS) = 0.2
TIME (MIN) = 355	DISCHARGE (CFS) = 0.2
TIME (MIN) = 360	DISCHARGE (CFS) = 0.2
TIME (MIN) = 365	DISCHARGE (CFS) = 0

Hydrograph Report

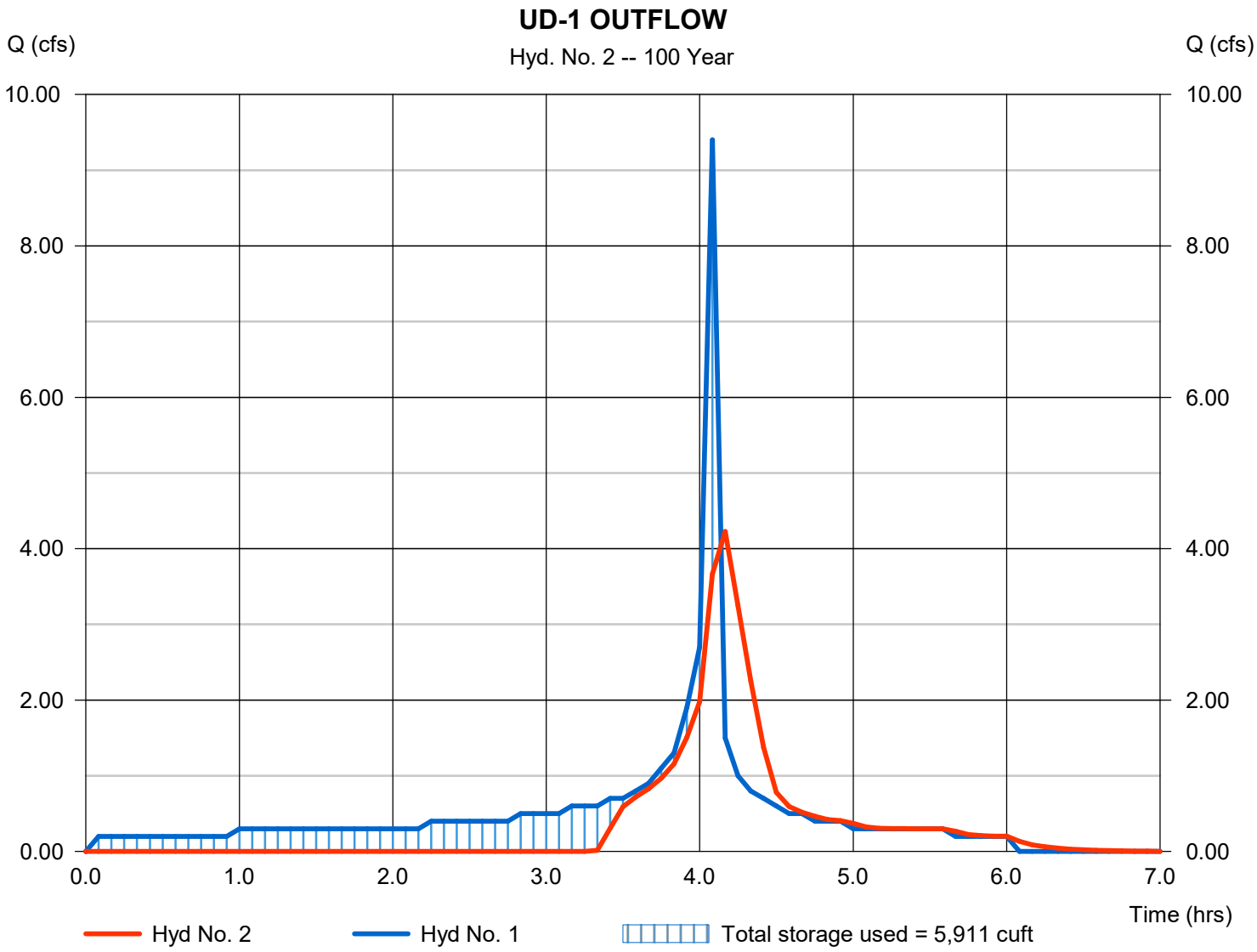
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 01 / 16 / 2025

Hyd. No. 2

UD-1 OUTFLOW

Hydrograph type	=	Reservoir	Peak discharge	=	4.226 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.17 hrs
Time interval	=	5 min	Hyd. volume	=	9,015 cuft
Inflow hyd. No.	=	1 - UD-1 INFLOW	Max. Elevation	=	596.13 ft
Reservoir name	=	UD-1	Max. Storage	=	5,911 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 01 / 22 / 2025

Pond No. 1 - UD-1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 590.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	590.50	1,050	0	0
1.00	591.50	1,050	1,050	1,050
2.00	592.50	1,050	1,050	2,100
3.00	593.50	1,050	1,050	3,150
4.00	594.50	1,050	1,050	4,200
5.00	595.50	1,050	1,050	5,249
6.00	596.50	1,050	1,050	6,299
7.00	597.50	1,050	1,050	7,349
8.00	598.50	1,050	1,050	8,399

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 1.13	4.00	Inactive	Inactive
Span (in)	= 1.13	24.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 590.50	594.23	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.50	Inactive	Inactive	Inactive
Crest El. (ft)	= 597.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	590.50	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	1,050	591.50	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
2.00	2,100	592.50	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
3.00	3,150	593.50	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
4.00	4,200	594.50	0.00	0.96 ic	---	---	0.00	---	---	---	---	---	0.955
5.00	5,249	595.50	0.00	3.37 ic	---	---	0.00	---	---	---	---	---	3.372
6.00	6,299	596.50	0.00	4.66 ic	---	---	0.00	---	---	---	---	---	4.655
7.00	7,349	597.50	0.09 ic	5.65 ic	---	---	0.07 s	---	---	---	---	---	5.727
8.00	8,399	598.50	0.09 ic	6.50 ic	---	---	0.00	---	---	---	---	---	6.596

Vault Drawdown Calculation - UD1

Project Name	**Cubesmart Self Storage**	
Project Number	**13003.85**	
Vault Drawdown	**49.37**	**hrs**

Total Vault Volume (cf)	8400
Total Chamber Height (ft)	8

Note: Drawdown time is calculated assuming initial water surface depth equal to the invert of the lowest surface discharge opening in the basin outlet structure.

Orifice Diameter:		**1.13**
C:		**0.6**

Qorifice=CoAo*[(2gHo)^0.5]

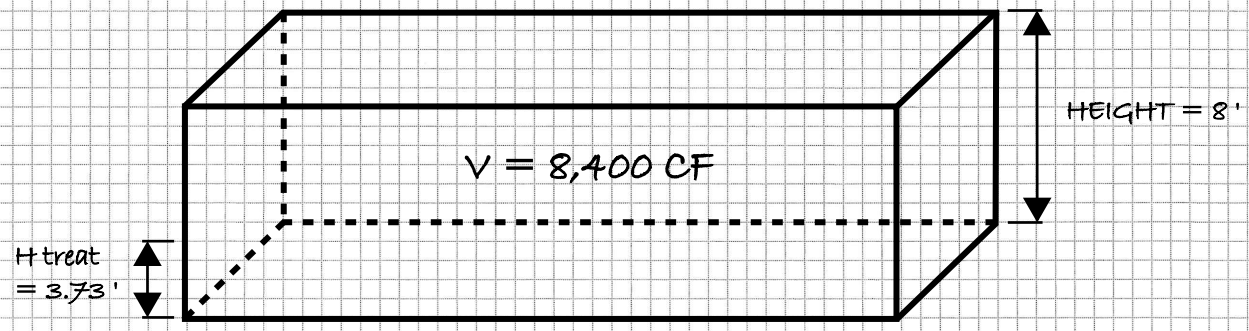
Surface Depth (ft)	Area (sq. ft)	Volume (cf)	Qorifice (cfs)	T (hrs)	Total Time (hrs)
3.73	1050	3916.5	0.06	0.00	0.00
3.5	1050	3675	0.06	1.08	1.08
3.25	1050	3413	0.06	1.22	2.30
3	1050	3150	0.06	1.27	3.56
2.5	1050	2625	0.05	2.77	6.34
2	1050	2100	0.05	3.10	9.44
1.5	1050	1575	0.04	3.58	13.02
1	1050	1050	0.03	4.39	17.41
0.75	1050	788	0.03	2.53	19.94
0.5	1050	525	0.02	3.10	23.05
0.25	1050	263	0.02	4.39	27.43
0.0	1050	0	0.00	21.94	49.37

STEVENS CRESTO ENGINEERS

Sheet 1 of 1
Project No. 13003.85
Project
By KGS Chk
Date 01/20/2025

UD-1 VOLUME SIZING CALC

- MODULE SIZE (INTERNAL DIM): 8' H X 7' W X 15' L
- NUMBER OF MODULES: 10
- TOTAL VOLUME (V) = 10 (8' x 7' x 15') = 8,400 CF



- VOLUME PER 1 FT:

$$\frac{8{,}400\ CF = 8\ FT}{V1FT = 1\ FT}$$

$$V1FT = 1{,}050\ CF$$

- TREATMENT VOLUME: DCV * 1.5 = 2,605 CF * 1.5 = 3907.5 CF
- HEIGHT OF TREATMENT VOLUME:

$$\frac{1{,}050\ CF = 1\ FT}{3{,}907.5\ CF = H\ treat}$$

H treat = 3.73'

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UD2 INFLOW

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 1/21/2025
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 3.3 INCHES
BASIN AREA 1.11 ACRES
RUNOFF COEFFICIENT 0.8
PEAK DISCHARGE 6.87 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.2
TIME (MIN) = 10	DISCHARGE (CFS) = 0.2
TIME (MIN) = 15	DISCHARGE (CFS) = 0.2
TIME (MIN) = 20	DISCHARGE (CFS) = 0.2
TIME (MIN) = 25	DISCHARGE (CFS) = 0.2
TIME (MIN) = 30	DISCHARGE (CFS) = 0.2
TIME (MIN) = 35	DISCHARGE (CFS) = 0.2
TIME (MIN) = 40	DISCHARGE (CFS) = 0.2
TIME (MIN) = 45	DISCHARGE (CFS) = 0.2
TIME (MIN) = 50	DISCHARGE (CFS) = 0.2
TIME (MIN) = 55	DISCHARGE (CFS) = 0.2
TIME (MIN) = 60	DISCHARGE (CFS) = 0.2
TIME (MIN) = 65	DISCHARGE (CFS) = 0.2
TIME (MIN) = 70	DISCHARGE (CFS) = 0.2
TIME (MIN) = 75	DISCHARGE (CFS) = 0.2
TIME (MIN) = 80	DISCHARGE (CFS) = 0.2
TIME (MIN) = 85	DISCHARGE (CFS) = 0.2
TIME (MIN) = 90	DISCHARGE (CFS) = 0.2
TIME (MIN) = 95	DISCHARGE (CFS) = 0.2
TIME (MIN) = 100	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 110	DISCHARGE (CFS) = 0.3
TIME (MIN) = 115	DISCHARGE (CFS) = 0.3
TIME (MIN) = 120	DISCHARGE (CFS) = 0.3
TIME (MIN) = 125	DISCHARGE (CFS) = 0.3
TIME (MIN) = 130	DISCHARGE (CFS) = 0.3
TIME (MIN) = 135	DISCHARGE (CFS) = 0.3
TIME (MIN) = 140	DISCHARGE (CFS) = 0.3
TIME (MIN) = 145	DISCHARGE (CFS) = 0.3
TIME (MIN) = 150	DISCHARGE (CFS) = 0.3
TIME (MIN) = 155	DISCHARGE (CFS) = 0.3
TIME (MIN) = 160	DISCHARGE (CFS) = 0.3
TIME (MIN) = 165	DISCHARGE (CFS) = 0.4
TIME (MIN) = 170	DISCHARGE (CFS) = 0.4
TIME (MIN) = 175	DISCHARGE (CFS) = 0.4
TIME (MIN) = 180	DISCHARGE (CFS) = 0.4
TIME (MIN) = 185	DISCHARGE (CFS) = 0.4
TIME (MIN) = 190	DISCHARGE (CFS) = 0.4
TIME (MIN) = 195	DISCHARGE (CFS) = 0.5
TIME (MIN) = 200	DISCHARGE (CFS) = 0.5
TIME (MIN) = 205	DISCHARGE (CFS) = 0.6
TIME (MIN) = 210	DISCHARGE (CFS) = 0.6
TIME (MIN) = 215	DISCHARGE (CFS) = 0.7
TIME (MIN) = 220	DISCHARGE (CFS) = 0.7
TIME (MIN) = 225	DISCHARGE (CFS) = 0.9
TIME (MIN) = 230	DISCHARGE (CFS) = 1
TIME (MIN) = 235	DISCHARGE (CFS) = 1.5
TIME (MIN) = 240	DISCHARGE (CFS) = 3
TIME (MIN) = 245	DISCHARGE (CFS) = 6.87
TIME (MIN) = 250	DISCHARGE (CFS) = 1.2
TIME (MIN) = 255	DISCHARGE (CFS) = 0.8
TIME (MIN) = 260	DISCHARGE (CFS) = 0.6
TIME (MIN) = 265	DISCHARGE (CFS) = 0.5
TIME (MIN) = 270	DISCHARGE (CFS) = 0.5
TIME (MIN) = 275	DISCHARGE (CFS) = 0.4
TIME (MIN) = 280	DISCHARGE (CFS) = 0.4
TIME (MIN) = 285	DISCHARGE (CFS) = 0.3
TIME (MIN) = 290	DISCHARGE (CFS) = 0.3
TIME (MIN) = 295	DISCHARGE (CFS) = 0.3
TIME (MIN) = 300	DISCHARGE (CFS) = 0.3
TIME (MIN) = 305	DISCHARGE (CFS) = 0.3
TIME (MIN) = 310	DISCHARGE (CFS) = 0.3
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 320	DISCHARGE (CFS) = 0.2
TIME (MIN) = 325	DISCHARGE (CFS) = 0.2
TIME (MIN) = 330	DISCHARGE (CFS) = 0.2
TIME (MIN) = 335	DISCHARGE (CFS) = 0.2
TIME (MIN) = 340	DISCHARGE (CFS) = 0.2
TIME (MIN) = 345	DISCHARGE (CFS) = 0.2
TIME (MIN) = 350	DISCHARGE (CFS) = 0.2
TIME (MIN) = 355	DISCHARGE (CFS) = 0.2
TIME (MIN) = 360	DISCHARGE (CFS) = 0.2
TIME (MIN) = 365	DISCHARGE (CFS) = 0

Hydrograph Report

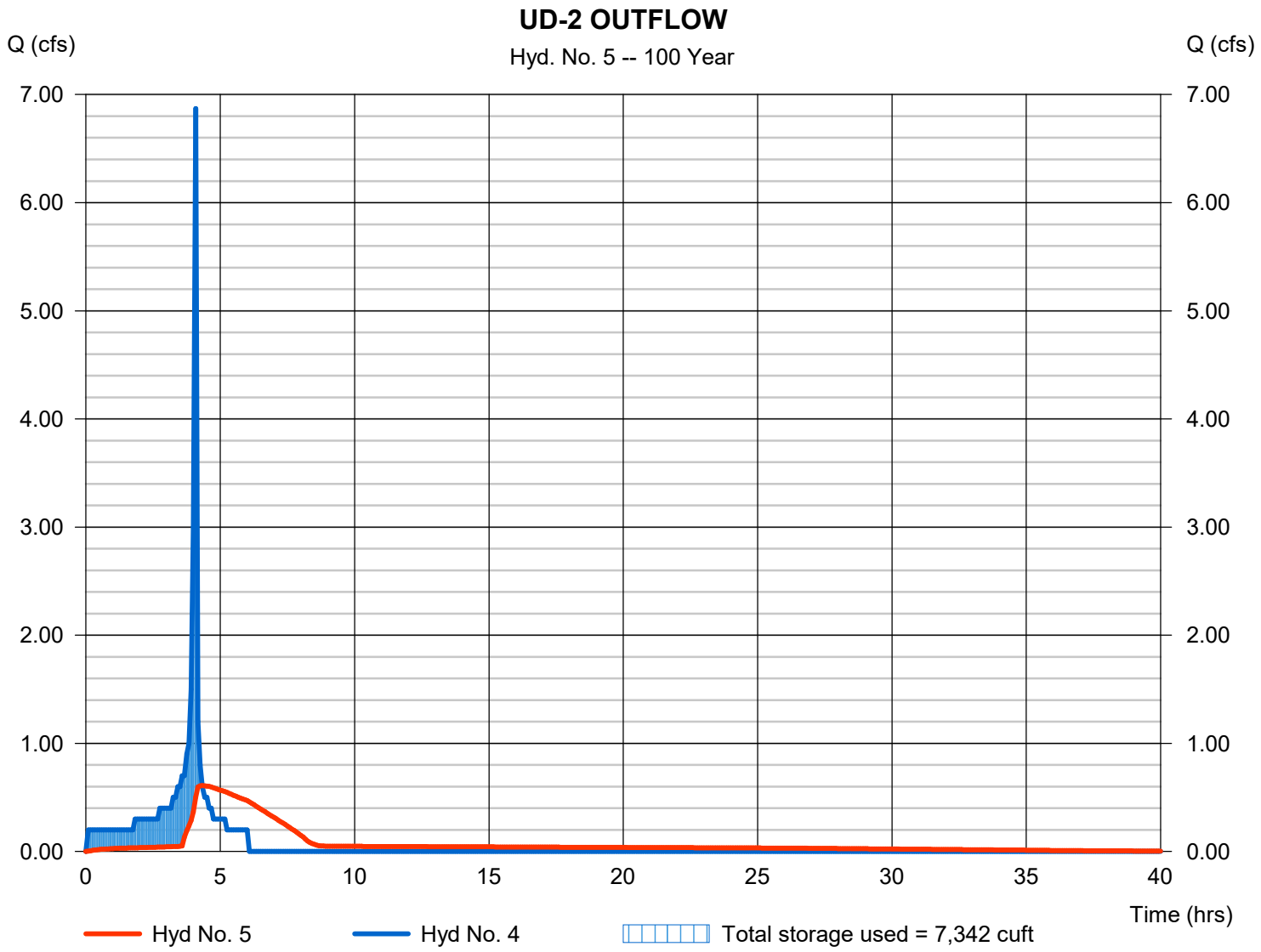
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 01 / 22 / 2025

Hyd. No. 5

UD-2 OUTFLOW

Hydrograph type	=	Reservoir	Peak discharge	=	0.609 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.33 hrs
Time interval	=	5 min	Hyd. volume	=	10,476 cuft
Inflow hyd. No.	=	4 - UD-2 INFLOW	Max. Elevation	=	593.71 ft
Reservoir name	=	UD-2	Max. Storage	=	7,342 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Wednesday, 01 / 22 / 2025

Pond No. 5 - UD-2

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	590.00	n/a	0	0
0.75	590.75	n/a	841	841
1.00	591.00	n/a	606	1,447
1.25	591.25	n/a	600	2,047
1.50	591.50	n/a	593	2,640
1.75	591.75	n/a	586	3,226
2.00	592.00	n/a	576	3,802
2.25	592.25	n/a	565	4,367
2.50	592.50	n/a	553	4,920
2.75	592.75	n/a	539	5,459
3.00	593.00	n/a	522	5,981
3.25	593.25	n/a	503	6,484
3.50	593.50	n/a	479	6,963
3.75	593.75	n/a	450	7,413
4.00	594.00	n/a	411	7,824
4.25	594.25	n/a	347	8,171
4.50	594.50	n/a	297	8,468
4.75	594.75	n/a	281	8,749
5.00	595.00	n/a	280	9,029
5.25	595.25	n/a	281	9,310
5.50	595.50	n/a	280	9,590

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 1.10	1.00	Inactive	Inactive
Span (in)	= 1.00	11.75	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 590.00	591.79	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.50	0.00	0.00	0.00
Crest El. (ft)	= 595.25	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	590.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.75	841	590.75	0.03 ic	0.00	---	---	0.00	---	---	---	---	---	0.031
1.00	1,447	591.00	0.04 ic	0.00	---	---	0.00	---	---	---	---	---	0.036
1.25	2,047	591.25	0.04 ic	0.00	---	---	0.00	---	---	---	---	---	0.040
1.50	2,640	591.50	0.04 ic	0.00	---	---	0.00	---	---	---	---	---	0.044
1.75	3,226	591.75	0.05 ic	0.00	---	---	0.00	---	---	---	---	---	0.048
2.00	3,802	592.00	0.05 ic	0.16 ic	---	---	0.00	---	---	---	---	---	0.213
2.25	4,367	592.25	0.05 ic	0.25 ic	---	---	0.00	---	---	---	---	---	0.309
2.50	4,920	592.50	0.06 ic	0.32 ic	---	---	0.00	---	---	---	---	---	0.379
2.75	5,459	592.75	0.06 ic	0.38 ic	---	---	0.00	---	---	---	---	---	0.437
3.00	5,981	593.00	0.06 ic	0.42 ic	---	---	0.00	---	---	---	---	---	0.488
3.25	6,484	593.25	0.07 ic	0.47 ic	---	---	0.00	---	---	---	---	---	0.534
3.50	6,963	593.50	0.07 ic	0.51 ic	---	---	0.00	---	---	---	---	---	0.576
3.75	7,413	593.75	0.07 ic	0.54 ic	---	---	0.00	---	---	---	---	---	0.615
4.00	7,824	594.00	0.07 ic	0.58 ic	---	---	0.00	---	---	---	---	---	0.652
4.25	8,171	594.25	0.08 ic	0.61 ic	---	---	0.00	---	---	---	---	---	0.686
4.50	8,468	594.50	0.08 ic	0.64 ic	---	---	0.00	---	---	---	---	---	0.719
4.75	8,749	594.75	0.08 ic	0.67 ic	---	---	0.00	---	---	---	---	---	0.751
5.00	9,029	595.00	0.08 ic	0.70 ic	---	---	0.00	---	---	---	---	---	0.781
5.25	9,310	595.25	0.08 ic	0.73 ic	---	---	0.00	---	---	---	---	---	0.810
5.50	9,590	595.50	0.09 ic	0.75 ic	---	---	1.04	---	---	---	---	---	1.879

Vault Drawdown Calculation - UD2

Project Name	**Cubesmart Self Storage**	
Project Number	**13003.85**	
Vault Drawdown	**49.25**	**hrs**

Total Vault Volume (cf)	9591
Total Chamber Height (ft)	5.5

Note: Drawdown time is calculated assuming initial water surface depth equal to the invert of the lowest surface discharge opening in the basin outlet structure.

Orifice Diameter:		**1.10**
C:		**0.6**

Qorifice=CoAo*[(2gHo)^0.5]

Surface Depth (ft)	Area (sq. ft)	Volume (cf)	Qorifice (cfs)	T (hrs)	Total Time (hrs)
1.79	1743.8	3121.4	0.04	0.00	0.00
1.75	1743.8	3051.7	0.04	0.46	0.46
1.5	1743.8	2615.7	0.04	3.11	3.57
1.25	1743.8	2179.8	0.04	3.41	6.98
1	1743.8	1743.8	0.03	3.81	10.79
0.75	1743.8	1307.9	0.03	4.40	15.19
0.5	1743.8	871.9	0.02	5.39	20.58
0.4	1743.8	697.5	0.02	2.41	22.99
0.3	1743.8	523.1	0.02	2.78	25.78
0.2	1743.8	348.8	0.01	3.41	29.18
0.1	1743.8	174.4	0.01	4.82	34.00
0.0	1743.8	0.0	0.00	15.24	49.25

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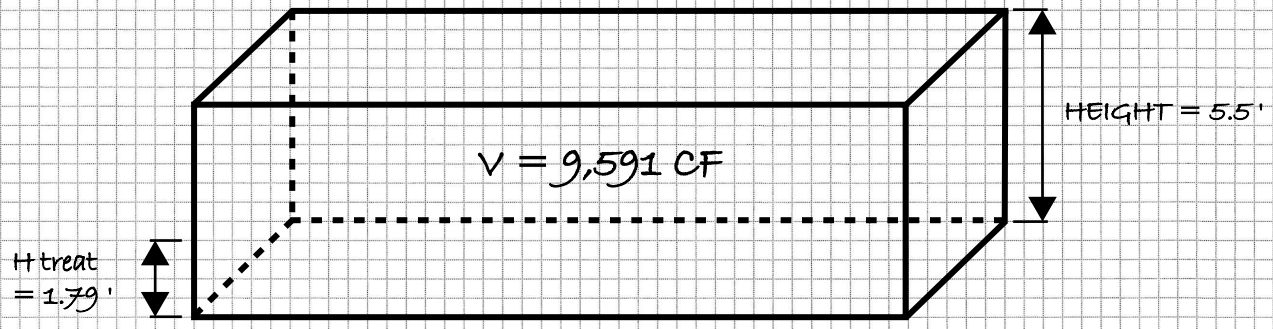
Sheet 1 of 1
Project No. 13003.85
Project
By KGS Chk
Date 01/20/2025

UD-2 VOLUME SIZING CALC

- MODULE SIZE (INTERNAL DIM): 5.5' H X 13.67' W X 127.54' L
- TOTAL VOLUME: 9,591 CF



- VOLUME PER 1 FT:

$$\frac{9{,}591\ CF = 5.5\ FT}{V1FT = 1\ FT}$$

$$V1FT = 1{,}743.8\ CF$$

- TREATMENT VOLUME: DCV * 1.5 = 2,074 CF * 1.5 = 3,111 CF
- HEIGHT OF TREATMENT VOLUME:

$$\frac{1{,}743.8\ CF = 1\ FT}{3{,}111\ CF = H\ treat}$$

H treat = 1.79'

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CUBESMART SELF STORAGE 13003.85 -

Project: **UD2**

StormTech
Detention • Retention • Water Quality
A division of CDS

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	51	
Number of End Caps -	6	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	0.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Amount of Stone Between Chambers -	6	in
Area of system -	2806	sf

☑ Include Perimeter Stone in Calculations

Min. Area - 2626 sf min. area

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch, EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	93.53	93.53	9590.96	5.50
65	0.00	0.00	0.00	0.00	93.53	93.53	9497.44	5.42
64	0.00	0.00	0.00	0.00	93.53	93.53	9403.91	5.33
63	0.00	0.00	0.00	0.00	93.53	93.53	9310.38	5.25
62	0.00	0.00	0.00	0.00	93.53	93.53	9216.86	5.17
61	0.00	0.00	0.00	0.00	93.53	93.53	9123.33	5.08
60	0.00	0.00	0.00	0.00	93.53	93.53	9029.81	5.00
59	0.00	0.00	0.00	0.00	93.53	93.53	8936.28	4.92
58	0.00	0.00	0.00	0.00	93.53	93.53	8842.75	4.83
57	0.00	0.00	0.00	0.00	93.53	93.53	8749.23	4.75
56	0.00	0.00	0.00	0.00	93.53	93.53	8655.70	4.67
55	0.00	0.00	0.00	0.00	93.53	93.53	8562.17	4.58
54	0.06	0.00	2.96	0.00	92.34	95.30	8468.65	4.50
53	0.19	0.02	9.90	0.14	89.51	99.55	8373.34	4.42
52	0.29	0.04	14.99	0.23	87.44	102.66	8273.79	4.33
51	0.40	0.05	20.59	0.31	85.17	106.06	8171.13	4.25
50	0.69	0.07	35.05	0.41	79.35	114.80	8065.07	4.17
49	1.03	0.09	52.44	0.53	72.34	125.31	7950.27	4.08
48	1.25	0.11	63.73	0.64	67.78	132.15	7824.96	4.00
47	1.42	0.13	72.53	0.76	64.21	137.50	7692.82	3.92
46	1.57	0.14	80.23	0.87	61.09	142.18	7555.32	3.83
45	1.71	0.16	87.06	0.98	58.31	146.35	7413.13	3.75
44	1.83	0.18	93.25	1.09	55.79	150.13	7266.78	3.67
43	1.94	0.20	98.83	1.20	53.51	153.54	7116.65	3.58
42	2.04	0.22	104.08	1.31	51.37	156.76	6963.10	3.50
41	2.13	0.23	108.87	1.41	49.41	159.69	6806.34	3.42
40	2.22	0.25	113.44	1.50	47.55	162.49	6646.65	3.33
39	2.31	0.27	117.65	1.59	45.83	165.07	6484.16	3.25
38	2.38	0.28	121.62	1.68	44.21	167.51	6319.09	3.17
37	2.46	0.29	125.41	1.76	42.66	169.83	6151.58	3.08
36	2.53	0.31	128.94	1.85	41.21	172.00	5981.75	3.00
35	2.59	0.32	132.28	1.93	39.84	174.05	5809.75	2.92
34	2.66	0.33	135.46	2.01	38.54	176.01	5635.70	2.83
33	2.72	0.35	138.47	2.08	37.31	177.86	5459.69	2.75
32	2.77	0.36	141.34	2.16	36.13	179.62	5281.84	2.67
31	2.82	0.37	144.06	2.23	35.01	181.30	5102.21	2.58
30	2.88	0.38	146.65	2.31	33.94	182.90	4920.91	2.50
29	2.92	0.40	149.13	2.38	32.92	184.43	4738.01	2.42
28	2.97	0.41	151.46	2.45	31.96	185.87	4553.58	2.33
27	3.01	0.42	153.63	2.51	31.07	187.21	4367.71	2.25
26	3.05	0.43	155.72	2.58	30.21	188.50	4180.50	2.17
25	3.09	0.44	157.81	2.64	29.35	189.80	3991.99	2.08
24	3.13	0.45	159.66	2.70	28.58	190.94	3802.20	2.00
23	3.17	0.46	161.45	2.77	27.84	192.05	3611.25	1.92
22	3.20	0.47	163.17	2.82	27.13	193.12	3419.20	1.83
21	3.23	0.48	164.79	2.88	26.46	194.13	3226.07	1.75
20	3.26	0.49	166.33	2.94	25.82	195.09	3031.95	1.67
19	3.29	0.50	167.80	2.99	25.21	196.00	2836.86	1.58
18	3.32	0.51	169.22	3.04	24.62	196.88	2640.86	1.50
17	3.34	0.51	170.55	3.09	24.07	197.71	2443.98	1.42
16	3.37	0.52	171.80	3.13	23.55	198.49	2246.27	1.33
15	3.39	0.53	173.02	3.18	23.05	199.24	2047.78	1.25
14	3.41	0.54	174.14	3.22	22.58	199.94	1848.54	1.17
13	3.44	0.54	175.29	3.26	22.11	200.65	1648.60	1.08
12	3.46	0.55	176.34	3.30	21.67	201.31	1447.94	1.00
11	3.48	0.56	177.41	3.33	21.23	201.97	1246.63	0.92
10	3.51	0.59	178.76	3.57	20.59	202.92	1044.66	0.83
9	0.00	0.00	0.00	0.00	93.53	93.53	841.74	0.75
8	0.00	0.00	0.00	0.00	93.53	93.53	748.21	0.67
7	0.00	0.00	0.00	0.00	93.53	93.53	654.68	0.58
6	0.00	0.00	0.00	0.00	93.53	93.53	561.16	0.50
5	0.00	0.00	0.00	0.00	93.53	93.53	467.63	0.42
4	0.00	0.00	0.00	0.00	93.53	93.53	374.11	0.33
3	0.00	0.00	0.00	0.00	93.53	93.53	280.58	0.25
2	0.00	0.00	0.00	0.00	93.53	93.53	187.05	0.17
1	0.00	0.00	0.00	0.00	93.53	93.53	93.53	0.08

SECTION 6

SAN DIEGO COUNTY HYDROLOGY MANUAL REFERENCES

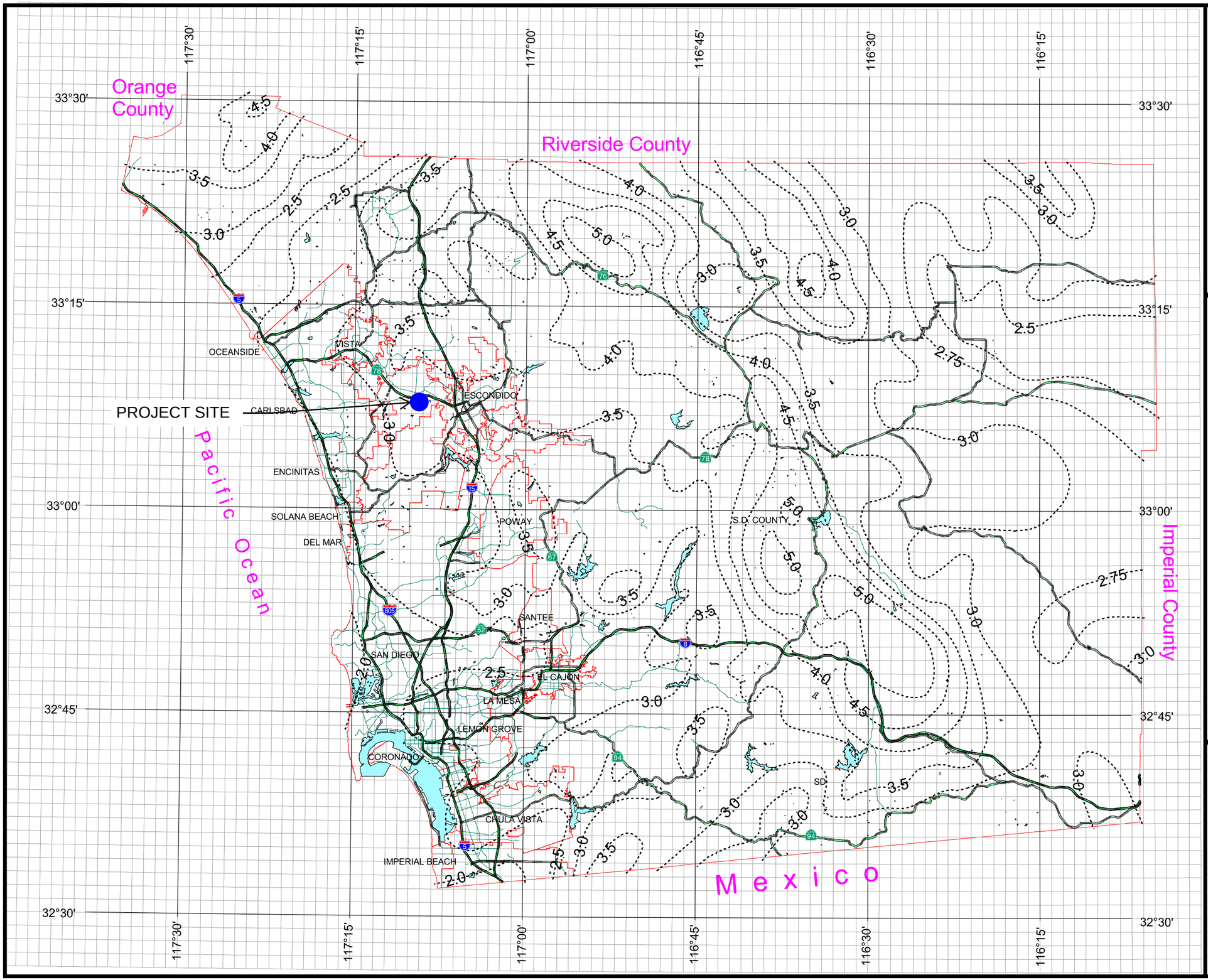
County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

P6 = 3.3



DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

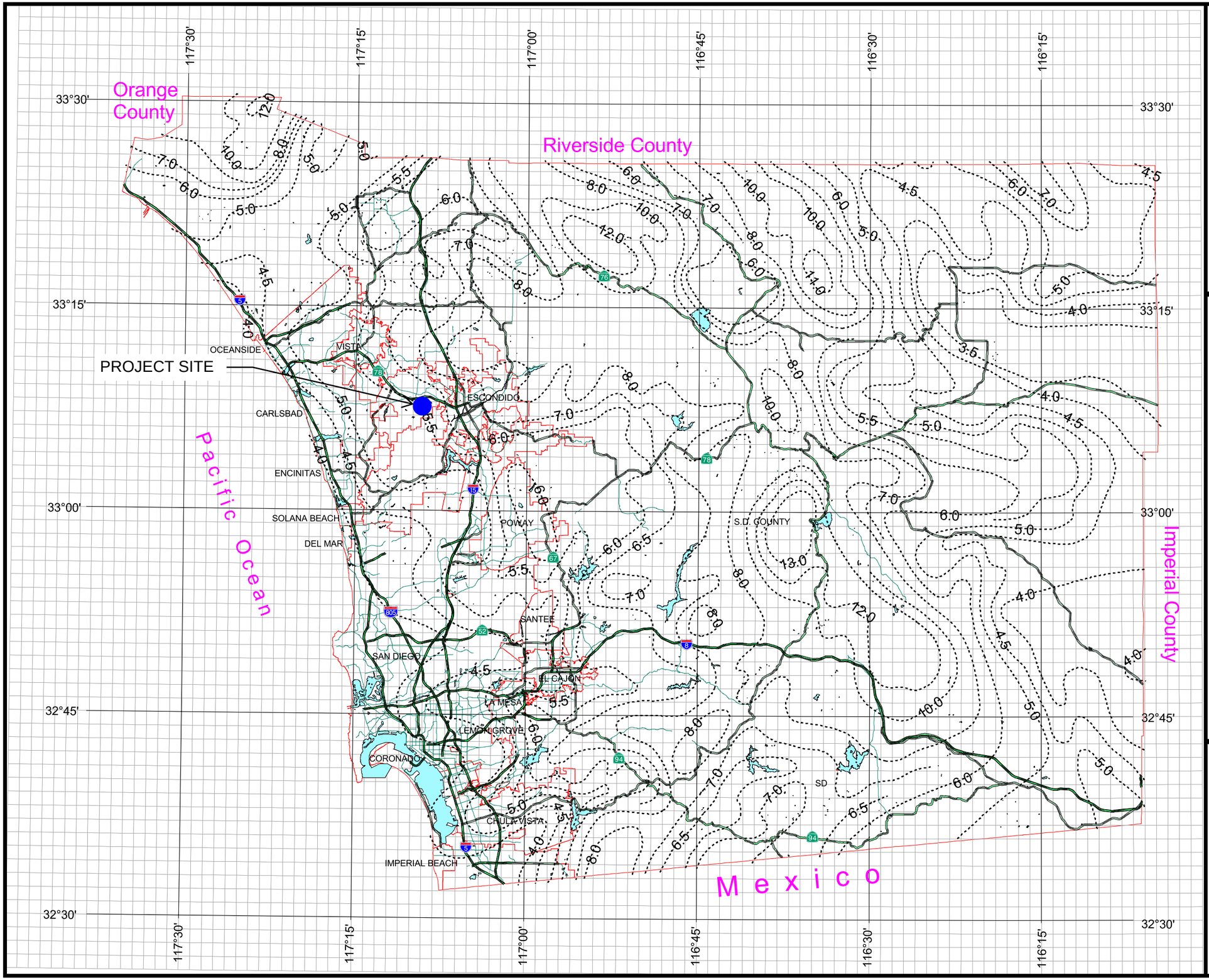
County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

P6 = 5.5



DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
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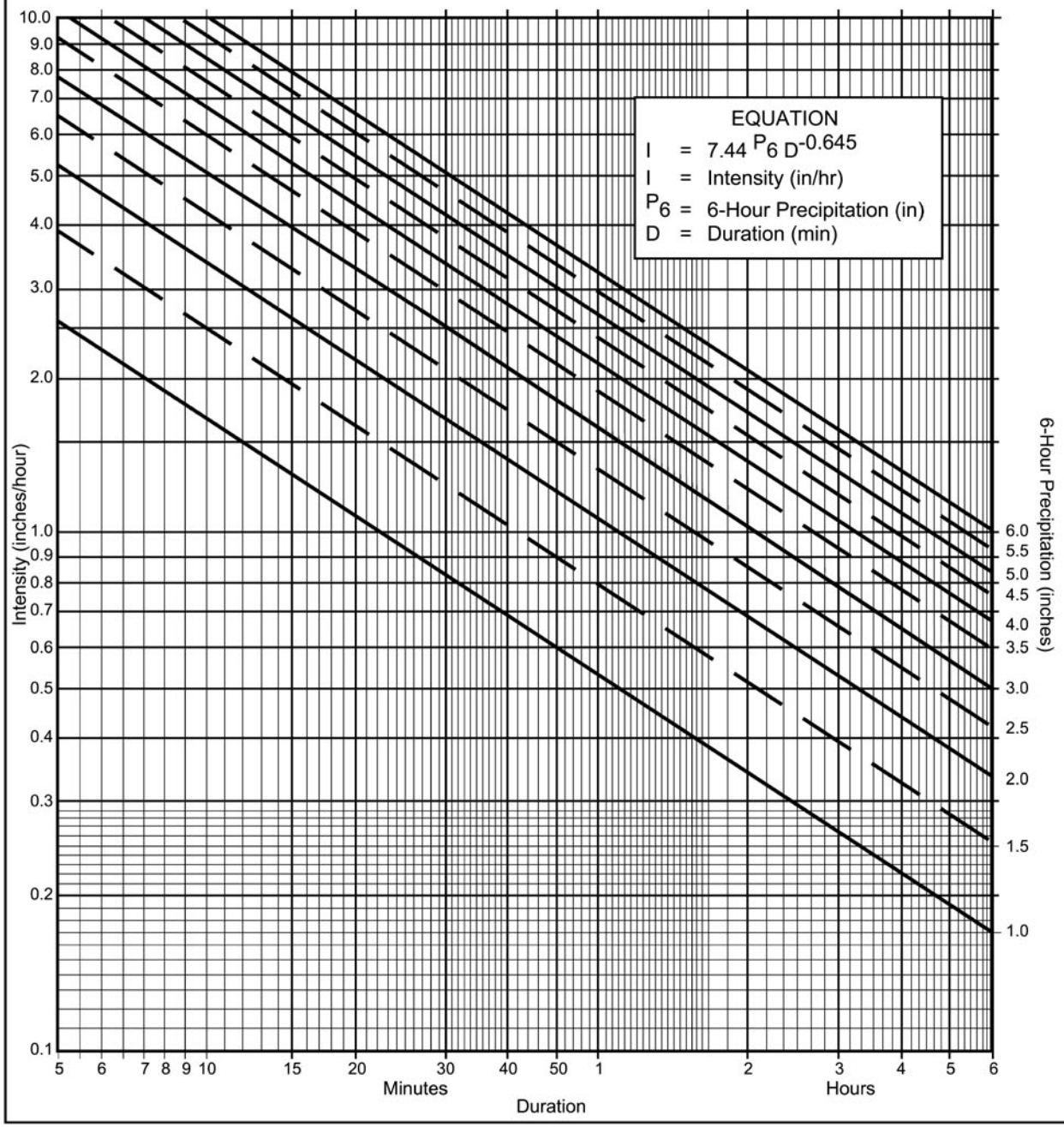
N
W E
S

3 0 3 Miles



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 3.3 in., P_{24} = 5.5, $\frac{P_6}{P_{24}}$ = 60 %(2)

(c) Adjusted P_6(2) = 3.3 in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

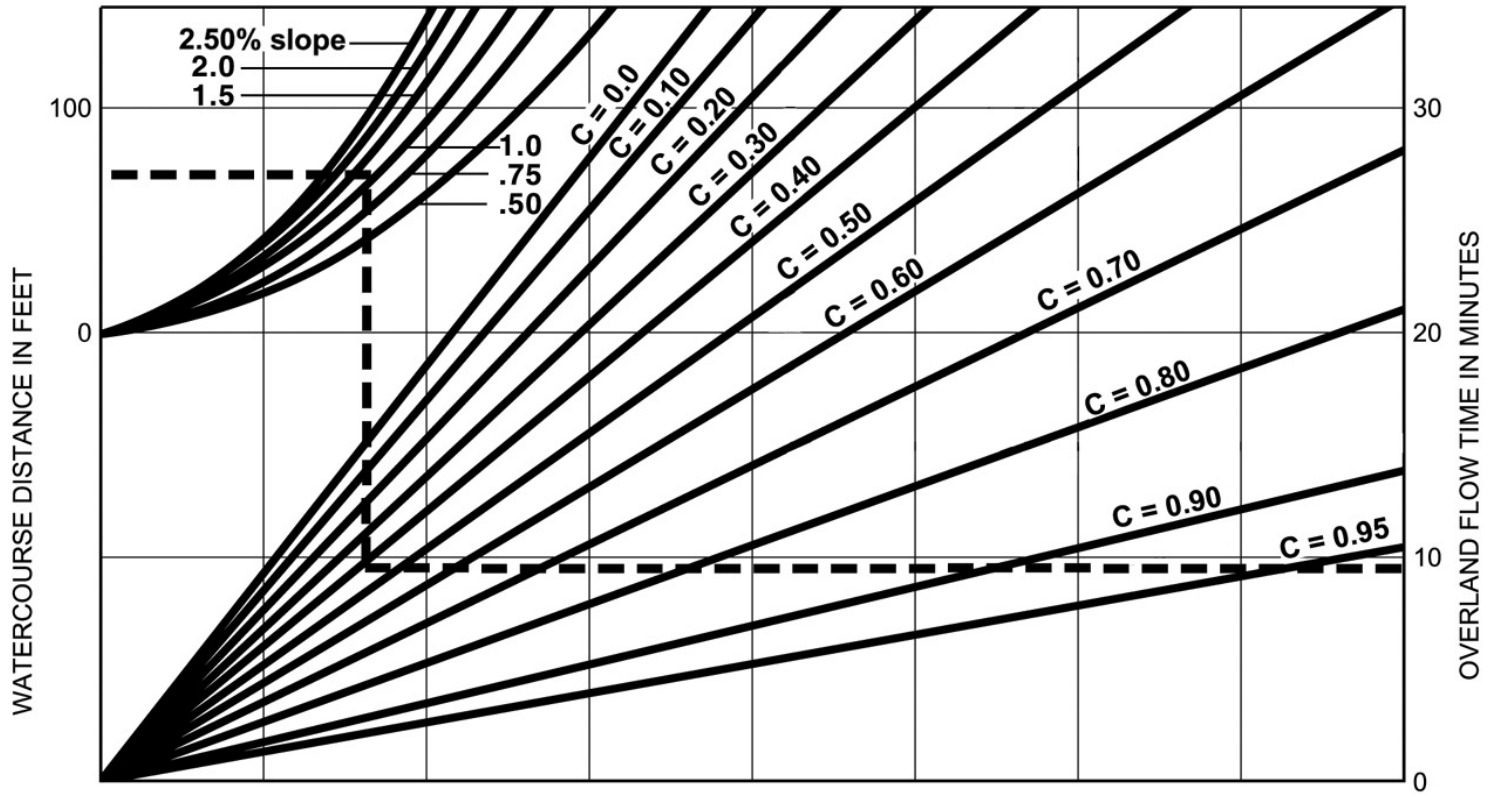
Intensity-Duration Design Chart - Template

FIGURE 3-1

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

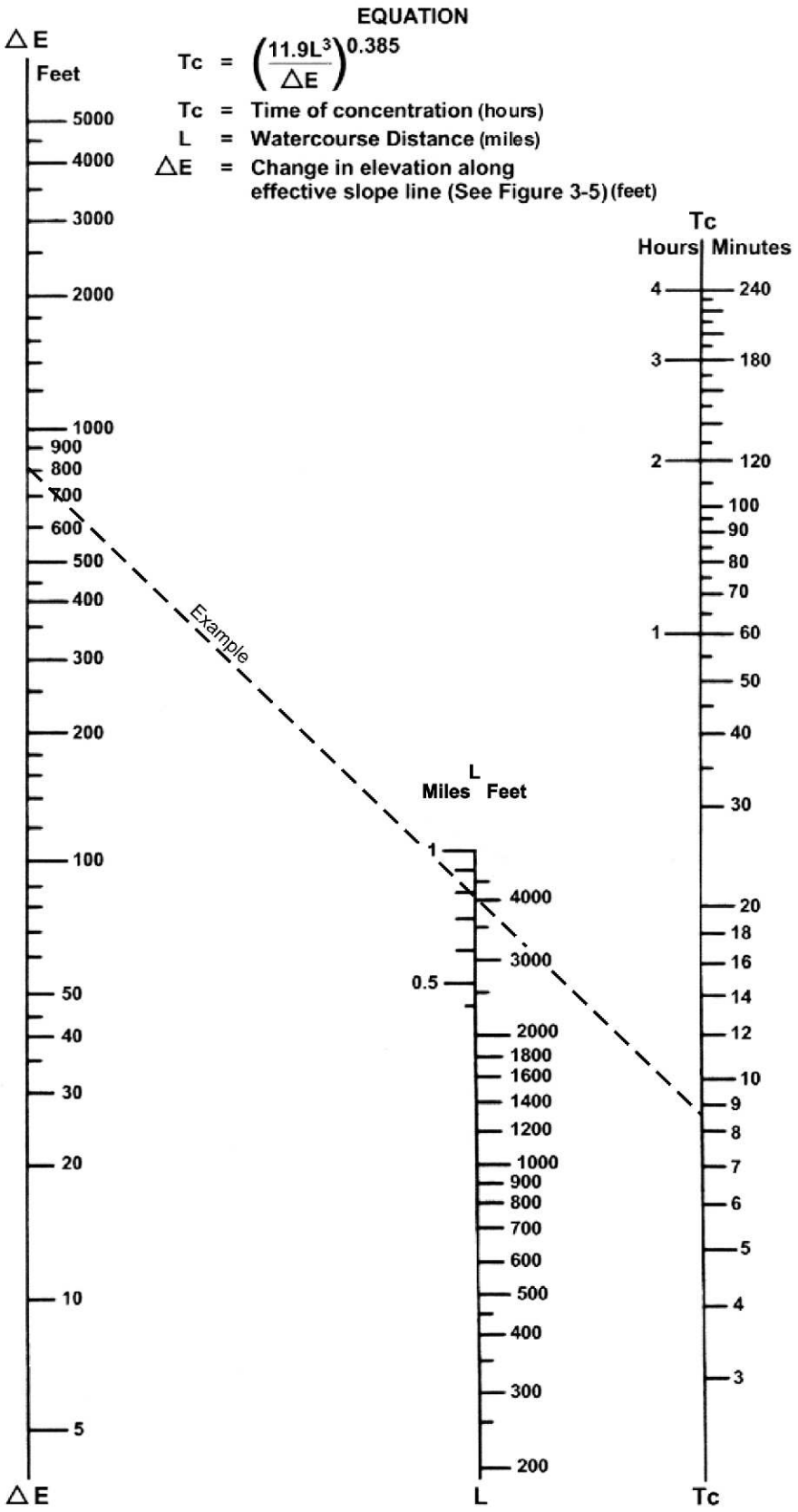
$$T = \frac{1.8\,(1.1\text{-}C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

FIGURE

Rational Formula - Overland Time of Flow Nomograph

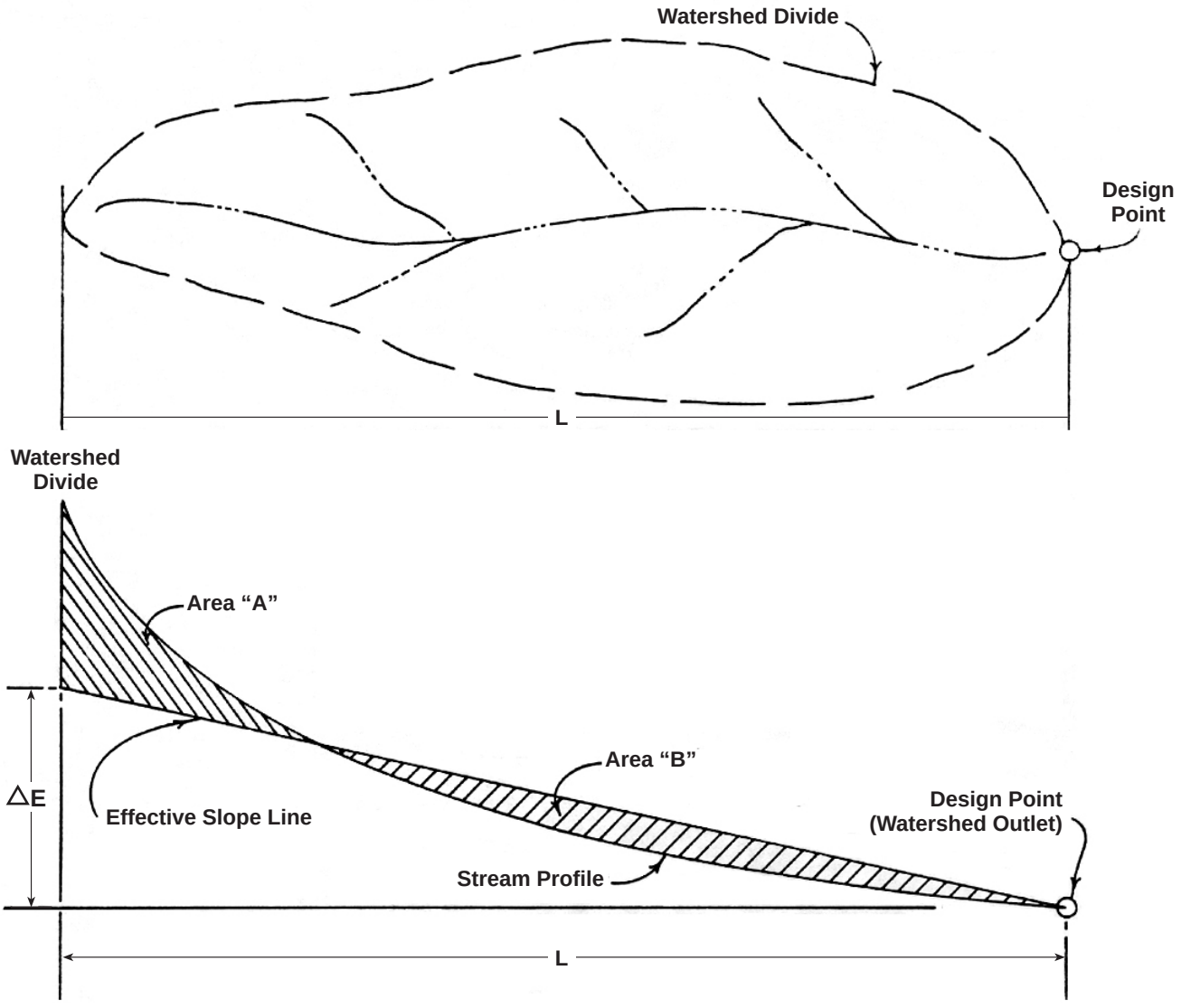
3-3



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE 3-4

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds



Area "A" = Area "B"

SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE

Computation of Effective Slope for Natural Watersheds

3-5

SECTION 7

DRAINAGE EXHIBITS

Exhibit A-2 (Pre-Project Drainage Basins)

Exhibit C (Post-Project Drainage Basins)

LEGEND

EXISTING STORM DRAIN

A1 / 2.90 – BASIN DESIGNATION / BASIN AREA (Acres)

DRAINAGE BASIN BOUNDARY

RUNOFF FLOW DIRECTION

EXISTING CONTOUR — 600

EXISTING STORM DRAIN

CARMEL STREET

NODE 109
Q=4.91 CFS
A=3.23 AC
TC=9.74 MIN

POC1
NODE 200
QPRE=10.93 CFS
Q100=10.07 CFS (DETAINED)

A1
2.90

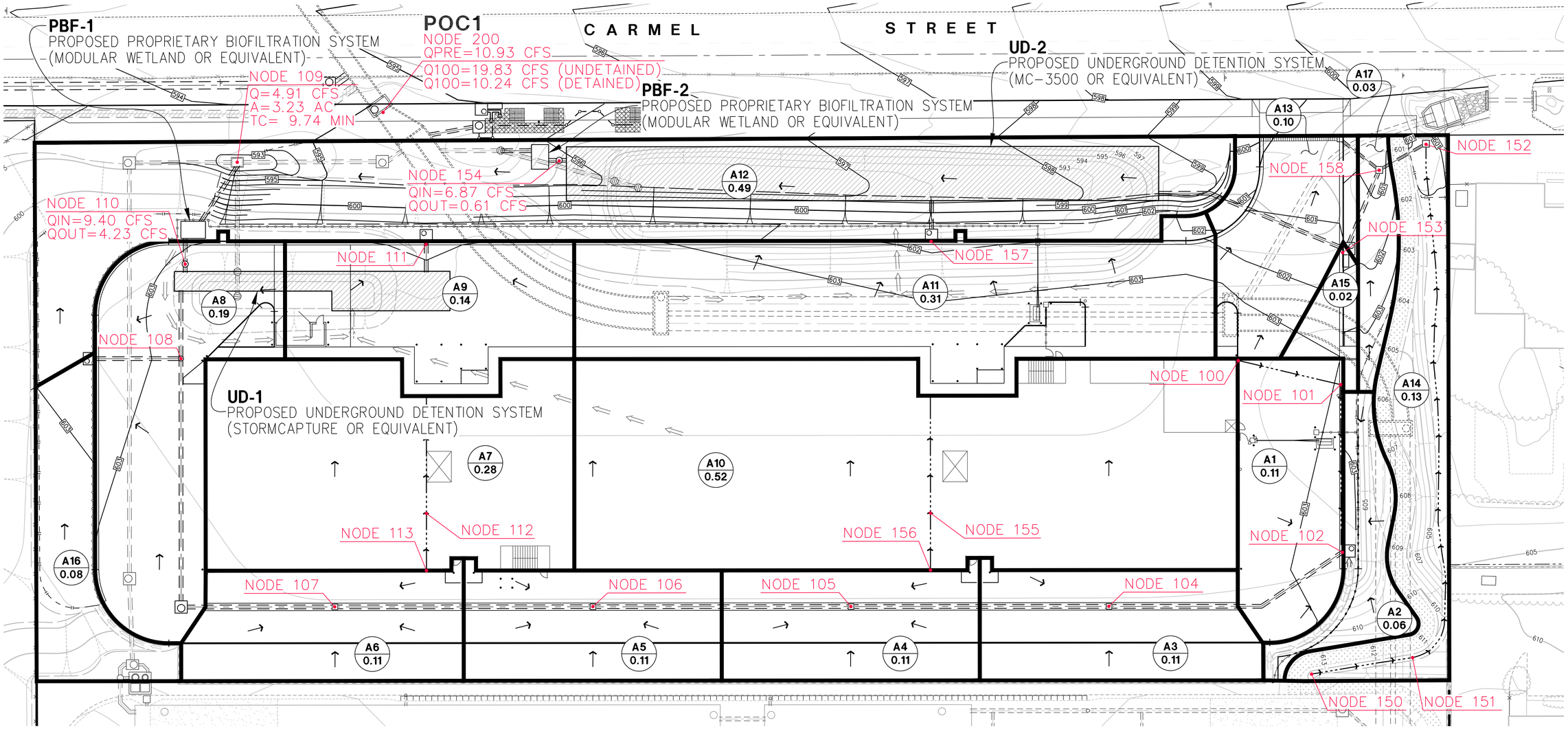
0 10 20 40 60
SCALE: 1"=20'

STEVENS CRESTO ENGINEERS
9665 Chesapeake Dr, Ste 200
San Diego, CA 92123
858.694.5660 stevenscresto.com

CUBESMART SELF STORAGE
SAN MARCOS, CALIFORNIA

EXHIBIT A-2
PRE-PROJECT DRAINAGE BASINS

DATE: 01/21/2025
SCE NO. 13003.85
SHEET A-2
1 OF 1 SHEETS



LEGEND

A1 / 0.11 – BASIN DESIGNATION / BASIN AREA (ACRES)

- DRAINAGE BASIN BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- EXISTING CONTOUR (600)
- PROPOSED CONTOUR (600)
- RUNOFF FLOW DIRECTION
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN

PROPOSED BMPs

- PROPOSED UNDERGROUND DETENTION SYSTEM (100-YEAR PEAK FLOW & HYDROMODIFICATION MITIGATION) — UD-1
- PROPOSED PROPRIETARY BIOFILTRATION SYSTEM (WATER QUALITY) — PBF-1

0 10 20 40
SCALE: 1"=20'

STEVENS CRESTO ENGINEERS
9665 Chesapeake Dr, Ste 200
San Diego, CA 92123
858.694.5660 stevenscresto.com

CUBESMART SELF STORAGE
SAN MARCOS, CALIFORNIA

EXHIBIT C
POST-PROJECT DRAINAGE BASINS

DATE: 03/24/2025
SCE NO. 13003.85
SHEET C
1 OF 1 SHEETS