Prologis Chino Distribution Center

Preliminary Drainage Study

Jan. 24, 2025

Prepared by: **RRM Design Group**

Prepared for: **Prologis**

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Table of Contents

Purpose of Report

The purpose of this report is to assess the project site, identify the pre-development and post-development hydrologic conditions for the proposed Prologis Distribution Center in the City of Chino, CA. The proposed improvements consist of redeveloping and existing industrial site with multiple buildings into a new distribution center with one 390,000 sf building. This will include the construction of retaining walls, concrete flatwork, landscaping, new ROW improvements, sidewalk, trash enclosures, storm water detention systems and treatment best management practices (BMPs). This report does not discuss the post construction water quality requirements, but these can be found in the project's Preliminary WQMP. The governing jurisdictions for this project include:

- City of Chino
- Santa Ana Regional Water Quality Control Board (SARWQCB)

Location

The ~18-acre project site is located on the north side of Edison Avenue, between Monte Vista Avenue and Central Avenue. The site is currently zoned industrial and is surrounded by existing industrial facilities. The western and northern boundaries are delineated by railway corridor. See project vicinity map in Figure 1 below.

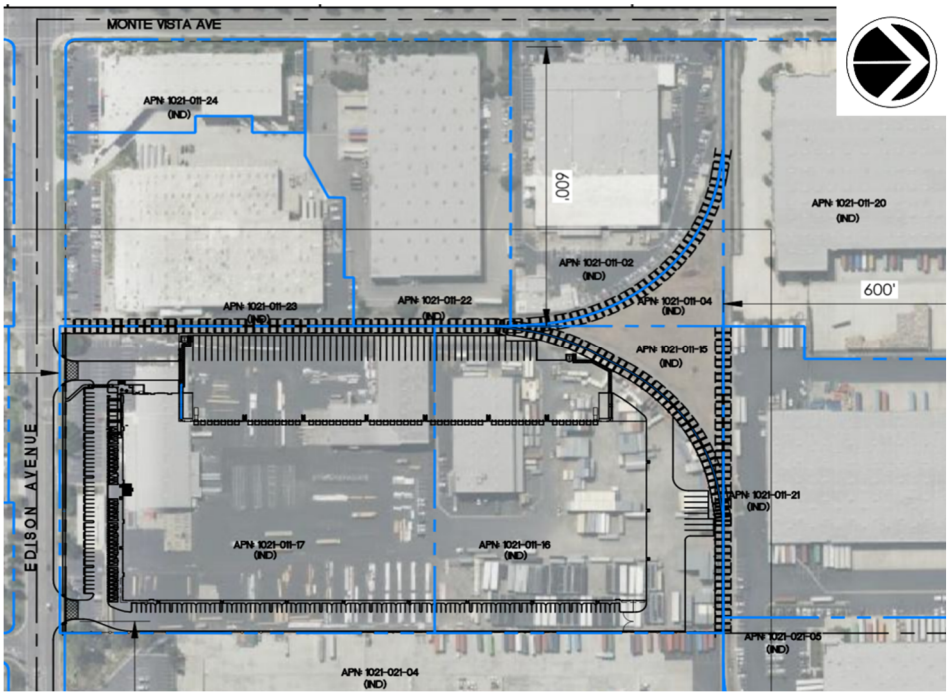


Figure 1

Existing Hydrologic Conditions

In its existing condition, the project site is entirely developed and contains no natural drainage pathways or features. As seen in the Existing Conditions Hydrology Exhibit in Appendix 2, runoff generated from the northern portion of the site sheet flows southwesterly into a ribbon gutter surrounding the northernmost building. A catch basin at the southwest corner of the ribbon gutter picks up the flow and

transports it via underground 21" corrugated steel pipe (CSP) south towards Edson Avenue. Another ~2.6-acre drainage area sheet flows to a catch basin along the western boundary of the site where it takes the flow to the 24" mainline going south. Finally, runoff generated in the south and eastern remainder of the site sheet flows south towards Edsion Avenue where it is transported via curb and gutter to a combination grate and curb opening inlet on the southwest corner of the site. Runoff from all these regions is combined at the inlet and transported across the street via a 21" CSP to the 48" reinforced concrete pipe (RCP) running east/west on the south side of Edison Avenue.

It is also worth noting that there is a private easement along the eastern portion of the site that contains a 36" concrete storm drain pipe that is not connected to the site in any way, but must remain.

Post-Development Hydrologic Conditions

In the post-development condition, the project proposes to redevelop the site to include a single building, staff auto parking, truck loading docks, truck/trailer parking spaces along the perimeter of the building, and landscaping throughout the site. Runoff generated from the site will fall into five main drainage basins.

The first drainage basin in the ribbon gutter along the center of the drive aisle. Runoff will then enter catch basins along the ribbon gutter and be transported via proposed storm drain pipes to an underground detention system where peak flows will be detained before being treated to meet water quality requirements. Treated or bypassed peak flows will then be transported to the existing curb inlet on Edison avenue before finally discharging to the same 48" RCP on the south side of Edison as in the existing conditions.

The second drainage basin will capture sheet flows from the Eastern half of the site in the ribbon gutter along the west edge of the drive aisle. Runoff will then enter catch basins along the ribbon gutter and be transported via proposed storm drain pipes to an underground detention system where peak flows will be detained before being treated to meet water quality requirements. Treated or bypassed peak flows will then be transported via proposed storm drain westerly towards the third basin and eventually connect to the mainline from the first basin.

The third basin captures the front office and front parking. Runoff generated in this area sheet flows to the bioretention basin along the south edge of the frontage parking. Treated or bypassed peak flows are transported via proposed storm drain pipe until the system connects to the post treatment storm drain line from basin one.

The fourth basin captures the western driveway and landscaping. Runoff generated in this area sheet flows to the bioretention basin along the southwest edge of the property. Treated or bypassed peak flows are transported via proposed storm drain pipe until the system connects to the post treatment storm drain line from basin one.

The fifth includes the existing perimeter of the site, railroad easement, and public right of way that will continue to follow their exiting drainage patterns. Runoff generated in this basin will flow towards the proposed curb inlet on the southwestern edge of the site. Flows will then be joined by the onsite runoff from basins 1-3 and discharge to the 48" RCP on the south side of Edison.

The ultimate discharge point for the proposed and existing site is a curb inlet and 21" CSP that will be removed during the construction of the southwestern driveway.

The proposed project does not include any changes to the site's overall drainage patterns. To address the potential for the site to create new hydrologic conditions of concern (HCOCs) an analysis of the existing conditions versus the post-development conditions for the 2-year event was also conducted.

Methodology

The existing and proposed hydrologic conditions were modeled in Advanced Engineering Software (AES – HydroWIN 2016) to compute the runoff generated from each drainage area. The software utilizes the Rational Method and conforms to the hydrologic methodologies set forth in the San Bernadino County Hydrology Manual (SBCHM). The Rational Method is used to calculate peak flow rates (Q) as a function of runoff coefficients (C), intensities (I), and drainage areas (A).

$$Q = C * i * A$$

Q – flow rate in cubic feet per second

i – rainfall intensity in inches per hour

A – drainage area in acres

AES is programed to utilize the regression equations within the SBCHM from precipitation depths and intensities for the 2-100-yr storm event. The program also incorporates the antecedent moisture condition, hydrologic soil type (NCRS, see Appendix A), pervious area percentage, and infiltration rates defined by the user to determine the appropriate watershed losses and runoff coefficient as laid out in the SBCHM. Time of concentration was developed internally though the AES program.

Results

Preliminary analysis of the existing and post-development conditions with and without the use of mitigation measures produced peak flows seem in Table 1.

Table 1. Peak Flow Summary

Peak Flows (CFS)				
Condition	**Storm Event**	**Area (acres)**	**Time of Concentration (min)**	**Peak Flow Rate (cfs)**
Existing	100-Year	19.1	12.3	51.38
Post-Development	100-Year	19.1	12.3	49.88
Mitigated: Post-Development	100-Year	19.1	13.2	20.79
DELTA (Mitigated Post - Existing)	100-Year	-	-	**-30.59**
Existing	2-Year	19.1	14.71	21.27
Post-Development	2-Year	19.1	16.87	18.44
DELTA (Post - Existing)	2-Year	19.1	-	**-2.83**

Conclusions

The proposed project does not modify the ultimate drainage area or patterns from the existing condition but reduces the amount of impervious area on site and provides an increased amount of collection points for generated runoff. Overall, the project sees a decrease in peak flow rate as compared to the existing condition by 1.50 cfs. However, to accompany the proposed water quality measures, proposed detention chambers and biofiltration planters are utilized to provide an added mitigation to the post-development flow rates. As seen in the peak flow summary above, the extra storage in the chambers and biofiltration planters reduces the overall peak flow rates by more than half. This creates a delta of 31 cfs as compared to the existing site conditions. It can also be seen that the analysis of the 2-year event for the post development conditions shows a lower flowrate and higher time of concentration than the existing conditions 2-year event. This indicates that the post-development conditions improves the naturalization of the hydrologic patterns onsite and does not create any ne HCOCs.

The proposed drainage design for this project will meet applicable standards and requirements for the City of Chino.

Appendix 1 – SBCHM Excerpts and Soil data

SBCHM Isoheytals

National Resource Conservation Service Soils Data

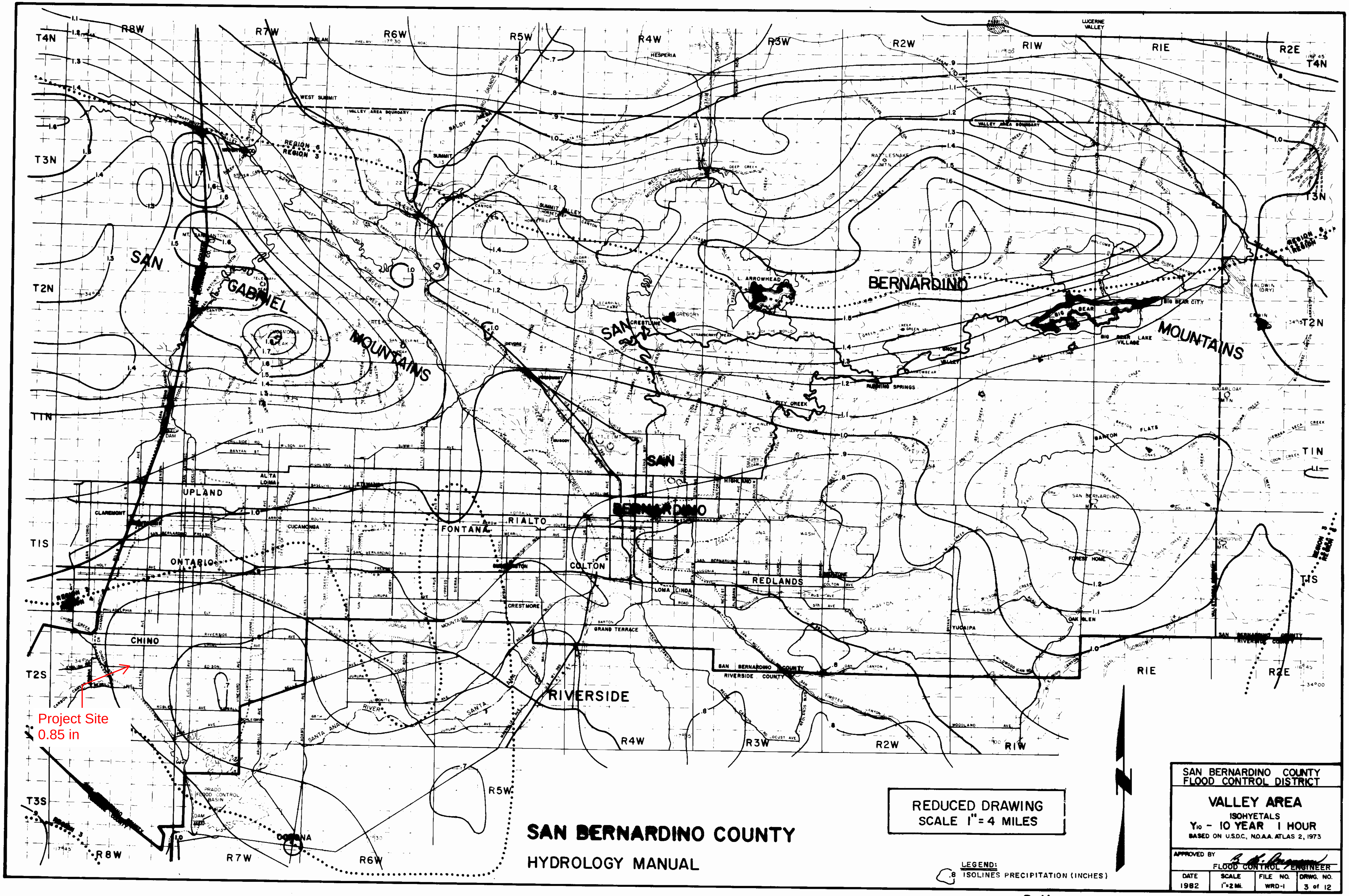
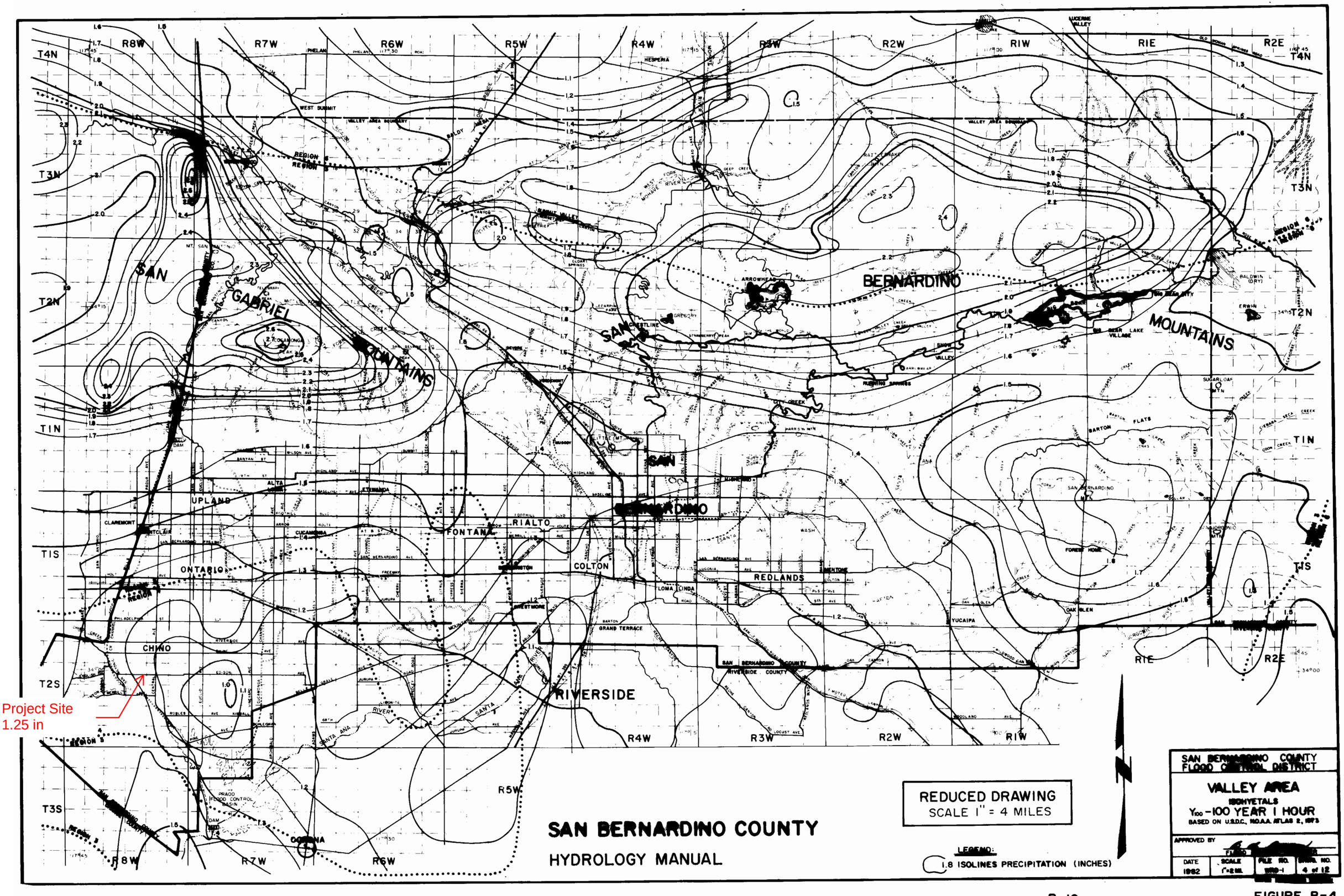

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
Y10 - 10 YEAR 1 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973
APPROVED BY
FLOOD CONTROL ENGINEER
DATE 1982
SCALE 1"=2 Mi.
FILE NO. WRD-1
DRWG. NO. 3 of 12
LEGEND:
.8 ISOLINES PRECIPITATION (INCHES)
Project Site
0.85 in
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
UPLAND
ONTARIO
CHINO
FONTANA
RIALTO
COLTON
SAN BERNARDINO
REDLANDS
RIVERSIDE
LOMA LINDA
GRAND TERRACE
YUCAIPA
CORONA
T4N
T3N
T2N
T1N
T1S
T2S
T3S
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E

FIGURE B-3



REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
1.8 ISOLINES PRECIPITATION (INCHES)

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

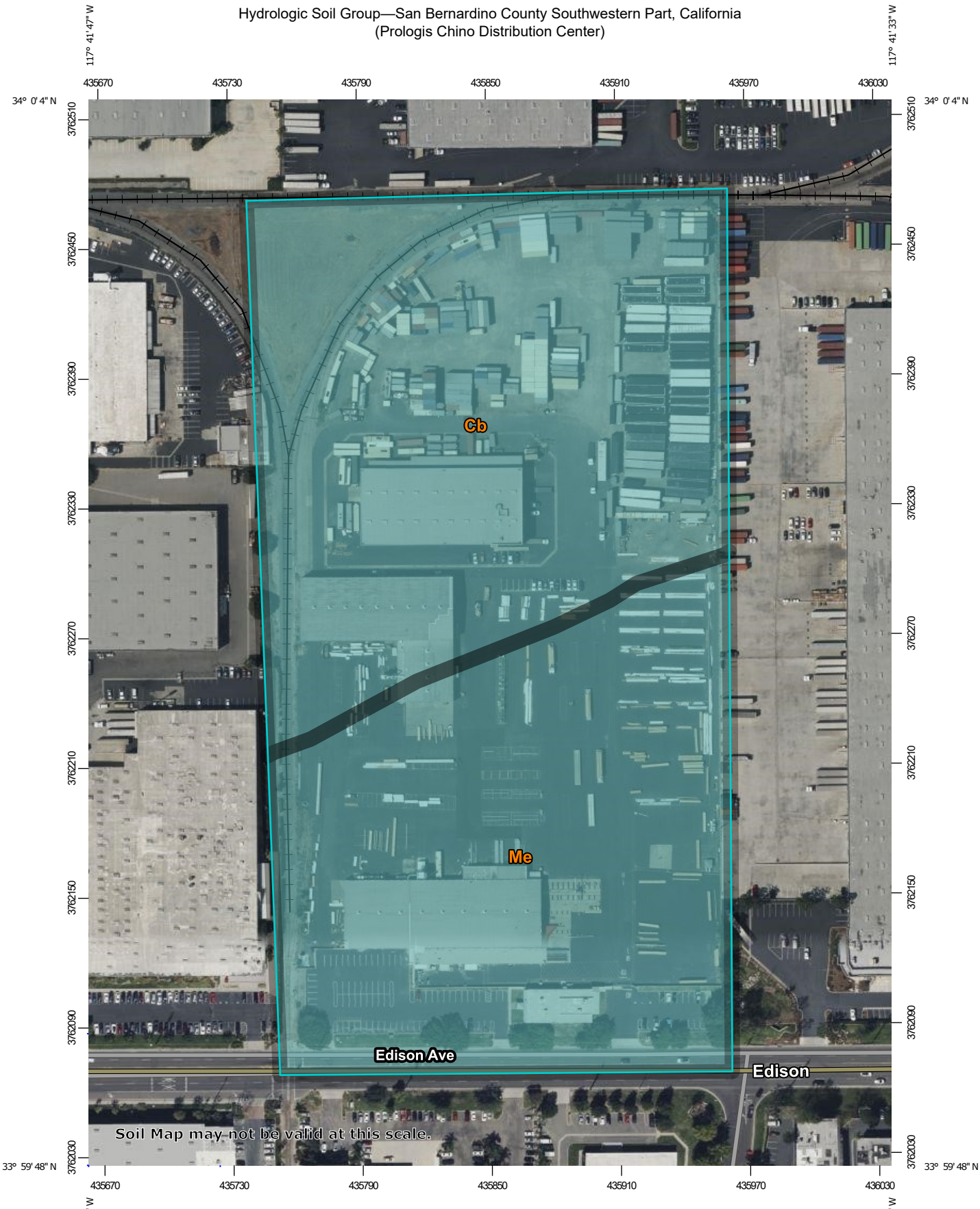
VALLEY AREA
ISOHYETALS
Y_{100} - 100 YEAR 1 HOUR
BASED ON U.S.D.C., NOAA ATLAS 2, 1973

APPROVED BY

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2MI.	VHD-1	4 of 12

FIGURE B-4

Hydrologic Soil Group—San Bernardino County Southwestern Part, California
(Prologis Chino Distribution Center)



Map Scale: 1:2,410 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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 Bernardino County Southwestern Part, California
Survey Area Data: Version 15, 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—Jun 12, 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
Cb	Chino silt loam	C	11.5	52.6%
Me	Merrill silt loam	C	10.4	47.4%
Totals for Area of Interest			**21.9**	**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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix 2 – Existing Conditions Hydrology

Existing Conditions AES Printouts

Existing Conditions Hydrology Exhibit

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1734

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITIONS                                                   *
* 2-YR EVENT                                                            *
* PROLOGIS DISTRIBUTION CENTER                                          *
 ************************************************************************

  FILE NAME: C:\AES\PROL\PROLEX2.DAT
  TIME/DATE OF STUDY: 13:26 05/23/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.850
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.250
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) = 0.5704
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   30.0     20.0    0.018/0.018/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```

```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    73.00
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    678.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.533
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 C        0.25      0.81     0.200    50    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.25   PEAK FLOW RATE(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    678.50  DOWNSTREAM(FEET) =    670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   871.00   CHANNEL SLOPE =  0.0098
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.456
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.03      0.27     0.050     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.050
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.91
  AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   7.58
  Tc(MIN.) =   12.58
  SUBAREA AREA(ACRES) =     7.03       SUBAREA RUNOFF(CFS) =    9.12
  EFFECTIVE AREA(ACRES) =      7.28     AREA-AVERAGED Fm(INCH/HR) =   0.02
  AREA-AVERAGED Fp(INCH/HR) =   0.34  AREA-AVERAGED Ap =   0.06
```

```
  TOTAL AREA(ACRES) =        7.3         PEAK FLOW RATE(CFS) =       9.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   2.33
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    110.00 =     944.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   660.00  DOWNSTREAM(FEET) =   654.79
  FLOW LENGTH(FEET) =   600.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.25
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.41
  PIPE TRAVEL TIME(MIN.) =   1.60    Tc(MIN.) =   14.18
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    102.00 =    1544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =   14.18
  RAINFALL INTENSITY(INCH/HR) =   1.36
  AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.34
  AREA-AVERAGED Ap =  0.06
  EFFECTIVE STREAM AREA(ACRES) =       7.28
  TOTAL STREAM AREA(ACRES) =       7.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.41

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  ELEVATION DATA: UPSTREAM(FEET) =    670.80  DOWNSTREAM(FEET) =    670.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.533
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  USER-DEFINED                -        0.19      0.27     0.001     -    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.001
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    670.50  DOWNSTREAM(FEET) =    664.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.00   CHANNEL SLOPE =  0.0142
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.739
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        2.40      0.27     0.010     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.010
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.75
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =    9.36
  SUBAREA AREA(ACRES) =     2.40       SUBAREA RUNOFF(CFS) =    3.76
  EFFECTIVE AREA(ACRES) =      2.59     AREA-AVERAGED Fm(INCH/HR) =   0.00
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.01
  TOTAL AREA(ACRES) =        2.6         PEAK FLOW RATE(CFS) =       4.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.08
  LONGEST FLOWPATH FROM NODE    108.00 TO NODE    104.00 =     509.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   655.47  DOWNSTREAM(FEET) =   654.79
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.29
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.05
```

```
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    9.43
  LONGEST FLOWPATH FROM NODE    108.00 TO NODE    102.00 =     538.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =    9.43
  RAINFALL INTENSITY(INCH/HR) =   1.73
  AREA-AVERAGED Fm(INCH/HR) =  0.00
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.01
  EFFECTIVE STREAM AREA(ACRES) =       2.59
  TOTAL STREAM AREA(ACRES) =       2.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.05

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.41   14.18    1.355  0.34( 0.02) 0.06       7.3     114.00
      2        4.05    9.43    1.731  0.27( 0.00) 0.01       2.6     108.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       12.07    9.43    1.731  0.33( 0.01) 0.04       7.4     108.00
      2       12.58   14.18    1.355  0.33( 0.01) 0.04       9.9     114.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.58    Tc(MIN.) =    14.18
  EFFECTIVE AREA(ACRES) =       9.87   AREA-AVERAGED Fm(INCH/HR) =  0.01
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.04
  TOTAL AREA(ACRES) =        9.9
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    102.00 =    1544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   654.79  DOWNSTREAM(FEET) =   653.92
  FLOW LENGTH(FEET) =   172.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.42
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.58
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   14.71
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    100.00 =    1716.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   14.71
  RAINFALL INTENSITY(INCH/HR) =   1.33
  AREA-AVERAGED Fm(INCH/HR) =  0.01
  AREA-AVERAGED Fp(INCH/HR) =  0.33
  AREA-AVERAGED Ap =  0.04
  EFFECTIVE STREAM AREA(ACRES) =       9.87
  TOTAL STREAM AREA(ACRES) =       9.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.58

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    116.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   263.00
  ELEVATION DATA: UPSTREAM(FEET) =    676.00  DOWNSTREAM(FEET) =    674.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.493
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.987
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  USER-DEFINED               -        0.39      0.27     0.001     -    7.49
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.001
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.39   PEAK FLOW RATE(CFS) =      0.70

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    674.00  DOWNSTREAM(FEET) =    663.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1244.00   CHANNEL SLOPE =  0.0088
 CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.163
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        8.83      0.27     0.090     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.090
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.92
 AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =  10.82
 Tc(MIN.) =   18.31
 SUBAREA AREA(ACRES) =     8.83       SUBAREA RUNOFF(CFS) =    9.05
 EFFECTIVE AREA(ACRES) =      9.22     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.09
 TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =       9.46

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   2.30
 LONGEST FLOWPATH FROM NODE    118.00 TO NODE    100.00 =    1507.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   18.31
 RAINFALL INTENSITY(INCH/HR) =   1.16
 AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.27
 AREA-AVERAGED Ap =  0.09
 EFFECTIVE STREAM AREA(ACRES) =       9.22
 TOTAL STREAM AREA(ACRES) =       9.22
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.46

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       12.07    9.96    1.675  0.33( 0.01) 0.04       7.4     108.00
     1       12.58   14.71    1.326  0.33( 0.01) 0.04       9.9     114.00
     2        9.46   18.31    1.163  0.27( 0.02) 0.09       9.2     118.00

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

```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       19.53    9.96    1.675  0.29( 0.02) 0.06      12.4     108.00
      2       21.27   14.71    1.326  0.30( 0.02) 0.06      17.3     114.00
      3       20.47   18.31    1.163  0.29( 0.02) 0.06      19.1     118.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      21.27    Tc(MIN.) =    14.71
  EFFECTIVE AREA(ACRES) =      17.27   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.06
  TOTAL AREA(ACRES) =       19.1
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    100.00 =    1716.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       19.1  TC(MIN.) =     14.71
  EFFECTIVE AREA(ACRES) =     17.27  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.062
  PEAK FLOW RATE(CFS)    =       21.27

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       19.53    9.96    1.675  0.29( 0.02) 0.06      12.4     108.00
      2       21.27   14.71    1.326  0.30( 0.02) 0.06      17.3     114.00
      3       20.47   18.31    1.163  0.29( 0.02) 0.06      19.1     118.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1734

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDTIONS                                                    *
* 100-YR EVENT                                                          *
* PROLOGIS DISTRIBUTION CENTER                                          *
 ************************************************************************

  FILE NAME: C:\AES\PROL\PROLEX.DAT
  TIME/DATE OF STUDY: 16:35 12/20/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.850
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.250
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) = 1.2500
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150
  2   30.0     20.0    0.018/0.018/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```

```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    73.00
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    678.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.552
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 C        0.25      0.27     0.200    86    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.24
  TOTAL AREA(ACRES) =      0.25   PEAK FLOW RATE(CFS) =      1.24

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    678.50  DOWNSTREAM(FEET) =    670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   871.00   CHANNEL SLOPE =  0.0098
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.533
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.03      0.27     0.050     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.050
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.58
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   5.62
  Tc(MIN.) =   10.62
  SUBAREA AREA(ACRES) =     7.03       SUBAREA RUNOFF(CFS) =   22.25
  EFFECTIVE AREA(ACRES) =      7.28     AREA-AVERAGED Fm(INCH/HR) =   0.01
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.06
```

```
  TOTAL AREA(ACRES) =        7.3         PEAK FLOW RATE(CFS) =      23.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   3.01
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    110.00 =     944.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   660.00  DOWNSTREAM(FEET) =   654.79
  FLOW LENGTH(FEET) =   600.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.72
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.03
  PIPE TRAVEL TIME(MIN.) =   1.30    Tc(MIN.) =   11.92
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    102.00 =    1544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =   11.92
  RAINFALL INTENSITY(INCH/HR) =   3.30
  AREA-AVERAGED Fm(INCH/HR) =  0.01
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.06
  EFFECTIVE STREAM AREA(ACRES) =       7.28
  TOTAL STREAM AREA(ACRES) =       7.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      23.03

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  ELEVATION DATA: UPSTREAM(FEET) =    670.80  DOWNSTREAM(FEET) =    670.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.552
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  USER-DEFINED                -        0.19      0.27     0.001     -    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.001
  SUBAREA RUNOFF(CFS) =      0.92
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.92

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    670.50  DOWNSTREAM(FEET) =    664.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   459.00   CHANNEL SLOPE =  0.0142
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.071
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        2.40      0.27     0.010     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.010
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.26
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   3.38
  Tc(MIN.) =    8.38
  SUBAREA AREA(ACRES) =     2.40       SUBAREA RUNOFF(CFS) =    8.81
  EFFECTIVE AREA(ACRES) =      2.59     AREA-AVERAGED Fm(INCH/HR) =   0.00
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.01
  TOTAL AREA(ACRES) =        2.6         PEAK FLOW RATE(CFS) =       9.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   2.64
  LONGEST FLOWPATH FROM NODE    108.00 TO NODE    104.00 =     509.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   655.47  DOWNSTREAM(FEET) =   654.79
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.10
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.48
```

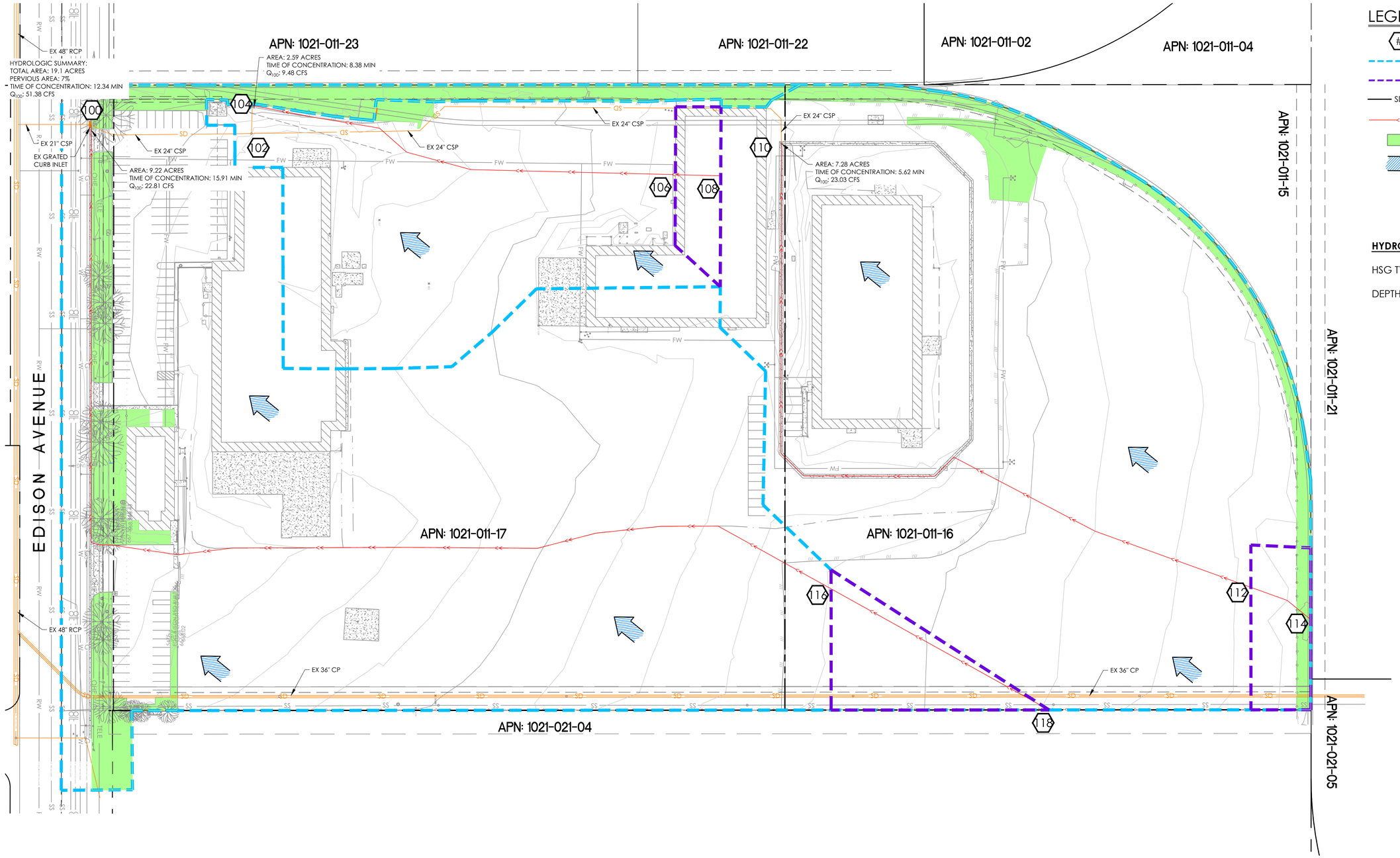
```
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.44
  LONGEST FLOWPATH FROM NODE    108.00 TO NODE    102.00 =     538.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =    8.44
  RAINFALL INTENSITY(INCH/HR) =   4.06
  AREA-AVERAGED Fm(INCH/HR) =  0.00
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.01
  EFFECTIVE STREAM AREA(ACRES) =       2.59
  TOTAL STREAM AREA(ACRES) =       2.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.48

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       23.03   11.92    3.297  0.27( 0.01) 0.06       7.3     114.00
      2        9.48    8.44    4.056  0.27( 0.00) 0.01       2.6     108.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       29.56    8.44    4.056  0.27( 0.01) 0.04       7.7     108.00
      2       30.74   11.92    3.297  0.27( 0.01) 0.04       9.9     114.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.74    Tc(MIN.) =    11.92
  EFFECTIVE AREA(ACRES) =       9.87   AREA-AVERAGED Fm(INCH/HR) =  0.01
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.04
  TOTAL AREA(ACRES) =        9.9
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    102.00 =    1544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   654.79  DOWNSTREAM(FEET) =   653.92
  FLOW LENGTH(FEET) =   172.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.76
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.74
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   12.34
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    100.00 =    1716.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   12.34
  RAINFALL INTENSITY(INCH/HR) =   3.23
  AREA-AVERAGED Fm(INCH/HR) =  0.01
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.04
  EFFECTIVE STREAM AREA(ACRES) =       9.87
  TOTAL STREAM AREA(ACRES) =       9.87
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      30.74

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    116.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   263.00
  ELEVATION DATA: UPSTREAM(FEET) =    676.00  DOWNSTREAM(FEET) =    674.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.493
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.355
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  USER-DEFINED               -        0.39      0.27     0.001     -    7.49
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.001
  SUBAREA RUNOFF(CFS) =      1.53
  TOTAL AREA(ACRES) =      0.39   PEAK FLOW RATE(CFS) =      1.53

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    674.00  DOWNSTREAM(FEET) =    663.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1244.00   CHANNEL SLOPE =  0.0088
 CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.772
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        8.83      0.27     0.090     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.090
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.46
 AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   8.42
 Tc(MIN.) =   15.91
 SUBAREA AREA(ACRES) =     8.83       SUBAREA RUNOFF(CFS) =   21.84
 EFFECTIVE AREA(ACRES) =      9.22     AREA-AVERAGED Fm(INCH/HR) =   0.02
 AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.09
 TOTAL AREA(ACRES) =        9.2         PEAK FLOW RATE(CFS) =      22.81

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   2.95
 LONGEST FLOWPATH FROM NODE    118.00 TO NODE    100.00 =    1507.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   15.91
 RAINFALL INTENSITY(INCH/HR) =   2.77
 AREA-AVERAGED Fm(INCH/HR) =  0.02
 AREA-AVERAGED Fp(INCH/HR) =  0.27
 AREA-AVERAGED Ap =  0.09
 EFFECTIVE STREAM AREA(ACRES) =       9.22
 TOTAL STREAM AREA(ACRES) =       9.22
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      22.81

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       29.56    8.86    3.937  0.27( 0.01) 0.04       7.7     108.00
     1       30.74   12.34    3.228  0.27( 0.01) 0.04       9.9     114.00
     2       22.81   15.91    2.772  0.27( 0.02) 0.09       9.2     118.00

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

```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       47.66    8.86    3.937  0.27( 0.02) 0.06      12.9     108.00
      2       51.38   12.34    3.228  0.27( 0.02) 0.06      17.0     114.00
      3       49.19   15.91    2.772  0.27( 0.02) 0.06      19.1     118.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      51.38    Tc(MIN.) =    12.34
  EFFECTIVE AREA(ACRES) =      17.02   AREA-AVERAGED Fm(INCH/HR) =  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.06
  TOTAL AREA(ACRES) =       19.1
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    100.00 =    1716.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       19.1  TC(MIN.) =     12.34
  EFFECTIVE AREA(ACRES) =     17.02  AREA-AVERAGED Fm(INCH/HR)=  0.02
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap = 0.061
  PEAK FLOW RATE(CFS)   =      51.38

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       47.66    8.86    3.937  0.27( 0.02) 0.06      12.9     108.00
      2       51.38   12.34    3.228  0.27( 0.02) 0.06      17.0     114.00
      3       49.19   15.91    2.772  0.27( 0.02) 0.06      19.1     118.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HYDROLOGY SUMMARY:
Q100 = 51.38 CFS
TC = 12.34 MIN



LEGEND

- DRAINAGE NODE
- DRAINAGE BASIN BOUNDARY
- DRAINAGE BASIN INITIAL SUB-AREA
- SD — EXISTING STORM DRAIN
- FLOW PATH
- PERVIOUS AREA
- FLOW DIRECTION

HYDROLOGIC INFORMATION SUMMARY

HSG TYPE: C

DEPTH TO GROUNDWATER: >20 FT

0 50 100 150 feet

1"=50'

rrm design group

PRELIMINARY
EXISTING HYDROLOGY
PROLOGIS DISTRIBUTION CENTER

H1

March 25, 2024

N:\3800\3857.01 CCD\Prologis-Chino Edison Distribution Center Demolition\Engineering\Dwg\Dev\Hydro\Exhibits\Existing Hydrology.dwg, SHEET TITLE, Mar 25, 2024 - 2:52pm, cmcook

Appendix 3 – Post-Development Conditions Hydrology

Post-development Conditions AES Printouts

Mitigated : Post-development Conditions AES Printout

Post-development Hydrology Exhibit

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1734

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* POST-DEVELOPMENT CONDITIONS                                           *
* 2-YR EVENT                                                            *
* PROLOGIS DISTRIBUTION CENTER                                          *
 ************************************************************************

  FILE NAME: C:\AES\PROL\PROLPR2.DAT
  TIME/DATE OF STUDY: 08:27 07/26/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.850
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.250
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) = 0.5704
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150
  2   30.0     20.0    0.018/0.018/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```

```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    108.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   127.00
  ELEVATION DATA: UPSTREAM(FEET) =    679.00  DOWNSTREAM(FEET) =    674.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.462
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.402
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       C        0.18      0.81     0.600    50    5.46
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.00  DOWNSTREAM(FEET) =    668.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   613.00   CHANNEL SLOPE =  0.0098
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.391
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.83      0.81     0.100    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.26
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   8.13
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =     2.83       SUBAREA RUNOFF(CFS) =    3.33
  EFFECTIVE AREA(ACRES) =      3.01     AREA-AVERAGED Fm(INCH/HR) =   0.11
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.81  AREA-AVERAGED Ap =   0.13
  TOTAL AREA(ACRES) =        3.0         PEAK FLOW RATE(CFS) =       3.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   1.59
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    106.00 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   664.34  DOWNSTREAM(FEET) =   661.45
  FLOW LENGTH(FEET) =   578.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.18
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.48
  PIPE TRAVEL TIME(MIN.) =   2.30    Tc(MIN.) =   15.89
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =    1318.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.89
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.266
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        6.39      0.81     0.100    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    6.39      SUBAREA RUNOFF(CFS) =    6.82
  EFFECTIVE AREA(ACRES) =      9.40   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        9.4       PEAK FLOW RATE(CFS) =       9.96

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   661.36  DOWNSTREAM(FEET) =   659.95
  FLOW LENGTH(FEET) =   281.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.39
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.96
  PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =   16.76
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1599.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    122.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  ELEVATION DATA: UPSTREAM(FEET) =    675.00  DOWNSTREAM(FEET) =    673.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.232
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.465
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.10      0.81     0.400    50    5.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.10   PEAK FLOW RATE(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    120.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    673.40  DOWNSTREAM(FEET) =    669.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.00   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.244
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        5.93      0.81     0.100    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.24
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  11.14
  Tc(MIN.) =   16.37
  SUBAREA AREA(ACRES) =     5.93       SUBAREA RUNOFF(CFS) =    6.20
  EFFECTIVE AREA(ACRES) =      6.03     AREA-AVERAGED Fm(INCH/HR) =   0.09
  AREA-AVERAGED Fp(INCH/HR) =   0.81  AREA-AVERAGED Ap =   0.11
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =       6.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   1.54
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    120.00 =     922.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   663.12  DOWNSTREAM(FEET) =   663.00
  FLOW LENGTH(FEET) =     3.10   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.34
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.29
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =   16.37
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    118.00 =     925.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   663.00  DOWNSTREAM(FEET) =   661.36
  FLOW LENGTH(FEET) =   328.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.82
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.29
  PIPE TRAVEL TIME(MIN.) =   1.13    Tc(MIN.) =   17.51
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    112.00 =    1253.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =   17.51
  RAINFALL INTENSITY(INCH/HR) =   1.19
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.11
  EFFECTIVE STREAM AREA(ACRES) =       6.03
  TOTAL STREAM AREA(ACRES) =       6.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.29

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    114.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    670.75  DOWNSTREAM(FEET) =    667.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.533
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        0.15      0.81     0.100    50    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  667.80  DOWNSTREAM ELEVATION(FEET) =  666.00
  STREET LENGTH(FEET) =   331.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  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 =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.90
```

```
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.27
  HALFSTREET FLOOD WIDTH(FEET) =    7.71
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.37
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.37
 STREET FLOW TRAVEL TIME(MIN.) =   4.03   Tc(MIN.) =    9.03
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 CONDOMINIUMS               C        0.83      0.81     0.350    50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA AREA(ACRES) =    0.83      SUBAREA RUNOFF(CFS) =    1.12
 EFFECTIVE AREA(ACRES) =      0.98    AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.31
 TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       1.34

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   9.30
 FLOW VELOCITY(FEET/SEC.) =  1.49   DEPTH*VELOCITY(FT*FT/SEC.) =   0.44
 LONGEST FLOWPATH FROM NODE    116.00 TO NODE    112.00 =     456.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =    9.03
 RAINFALL INTENSITY(INCH/HR) =   1.78
 AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.81
 AREA-AVERAGED Ap =  0.31
 EFFECTIVE STREAM AREA(ACRES) =       0.98
 TOTAL STREAM AREA(ACRES) =       0.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.34

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        6.29   17.51    1.194  0.81( 0.09) 0.11       6.0     124.00
     2        1.34    9.03    1.777  0.81( 0.25) 0.31       1.0     116.00

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

 ** PEAK FLOW RATE TABLE **
```

```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.29    9.03    1.777  0.81( 0.13) 0.15       4.1     116.00
      2        7.12   17.51    1.194  0.81( 0.11) 0.13       7.0     124.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.12    Tc(MIN.) =    17.51
  EFFECTIVE AREA(ACRES) =       7.01   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =        7.0
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    112.00 =    1253.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   661.36  DOWNSTREAM(FEET) =   660.48
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.91
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.12
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =   18.10
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    130.00 =    1429.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =   18.10
  RAINFALL INTENSITY(INCH/HR) =   1.17
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.13
  EFFECTIVE STREAM AREA(ACRES) =       7.01
  TOTAL STREAM AREA(ACRES) =       7.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.12

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    132.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    672.00  DOWNSTREAM(FEET) =    668.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.260
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.458
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               C        0.12      0.81     0.350    50    5.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.12   PEAK FLOW RATE(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    130.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  668.70  DOWNSTREAM ELEVATION(FEET) =  665.40
  STREET LENGTH(FEET) =   169.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  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 =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    7.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.65
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =    6.37
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.190
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  APARTMENTS                 C        1.31      0.81     0.200    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA AREA(ACRES) =    1.31      SUBAREA RUNOFF(CFS) =    2.40
  EFFECTIVE AREA(ACRES) =      1.43    AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.21
```

```
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       2.60

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.30   HALFSTREET FLOOD WIDTH(FEET) =   9.37
  FLOW VELOCITY(FEET/SEC.) =  2.86   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE    134.00 TO NODE    130.00 =     299.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =    6.37
  RAINFALL INTENSITY(INCH/HR) =   2.19
  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.21
  EFFECTIVE STREAM AREA(ACRES) =       1.43
  TOTAL STREAM AREA(ACRES) =       1.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.29    9.63    1.709  0.81( 0.13) 0.15       4.1     116.00
      1        7.12   18.10    1.171  0.81( 0.11) 0.13       7.0     124.00
      2        2.60    6.37    2.190  0.81( 0.17) 0.21       1.4     134.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        8.03    6.37    2.190  0.81( 0.14) 0.17       4.1     134.00
      2        8.27    9.63    1.709  0.81( 0.14) 0.17       5.5     116.00
      3        8.40   18.10    1.171  0.81( 0.12) 0.15       8.4     124.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.40    Tc(MIN.) =    18.10
  EFFECTIVE AREA(ACRES) =       8.44   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =        8.4
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    130.00 =    1429.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    102.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   660.48  DOWNSTREAM(FEET) =   659.95
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.25
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.40
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   18.44
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    102.00 =    1534.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        8.03    6.71    2.123  0.81( 0.14) 0.17       4.1     134.00
      2        8.27    9.97    1.674  0.81( 0.14) 0.17       5.5     116.00
      3        8.40   18.44    1.158  0.81( 0.12) 0.15       8.4     124.00
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    102.00 =    1534.10 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.96   16.76    1.226  0.81( 0.09) 0.11       9.4     110.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1599.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       15.16    6.71    2.123  0.81( 0.12) 0.14       7.9     134.00
      2       16.53    9.97    1.674  0.81( 0.11) 0.14      11.1     116.00
      3       18.34   16.76    1.226  0.81( 0.10) 0.13      17.3     110.00
      4       17.77   18.44    1.158  0.81( 0.10) 0.13      17.8     124.00
    TOTAL AREA(ACRES) =        17.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       18.34  Tc(MIN.) =   16.759
  EFFECTIVE AREA(ACRES) =     17.27  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =       17.8
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1599.00 FEET.

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

```
  FLOW PROCESS FROM NODE    102.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   659.95  DOWNSTREAM(FEET) =   659.70
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.34
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   16.87
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    100.00 =    1644.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   16.87
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.13
  EFFECTIVE STREAM AREA(ACRES) =      17.27
  TOTAL STREAM AREA(ACRES) =      17.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      18.34

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    126.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   242.00
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    679.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.073
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.664
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.09      0.81     0.400    50   10.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.10
```

```
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.10

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    679.00  DOWNSTREAM(FEET) =    663.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1521.00   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   0.25
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.469
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         C        1.15      0.81     0.900    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.35
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =  73.02
  Tc(MIN.) =   83.10
  SUBAREA AREA(ACRES) =     1.15       SUBAREA RUNOFF(CFS) =    0.05
  EFFECTIVE AREA(ACRES) =      1.24     AREA-AVERAGED Fm(INCH/HR) =   0.70
  AREA-AVERAGED Fp(INCH/HR) =   0.81  AREA-AVERAGED Ap =   0.87
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       0.10
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   0.33
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    100.00 =    1763.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   83.10
  RAINFALL INTENSITY(INCH/HR) =   0.47
  AREA-AVERAGED Fm(INCH/HR) =  0.70
  AREA-AVERAGED Fp(INCH/HR) =  0.81
```

```
 AREA-AVERAGED Ap =  0.87
 EFFECTIVE STREAM AREA(ACRES) =       1.24
 TOTAL STREAM AREA(ACRES) =       1.24
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.10

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       15.16    6.83    2.101  0.81( 0.12) 0.14       7.9     134.00
     1       16.53   10.09    1.663  0.81( 0.11) 0.14      11.1     116.00
     1       18.34   16.87    1.221  0.81( 0.10) 0.13      17.3     110.00
     1       17.77   18.55    1.154  0.81( 0.10) 0.13      17.8     124.00
     2        0.10   83.10    0.469  0.81( 0.70) 0.87       1.2     128.00

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

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       15.26    6.83    2.101  0.81( 0.12) 0.15       8.0     134.00
     2       16.63   10.09    1.663  0.81( 0.12) 0.15      11.3     116.00
     3       18.44   16.87    1.221  0.81( 0.11) 0.14      17.5     110.00
     4       17.87   18.55    1.154  0.81( 0.11) 0.14      18.1     124.00
     5        7.03   83.10    0.469  0.81( 0.14) 0.18      19.1     128.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      18.44    Tc(MIN.) =    16.87
 EFFECTIVE AREA(ACRES) =      17.52   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.14
 TOTAL AREA(ACRES) =       19.1
 LONGEST FLOWPATH FROM NODE    128.00 TO NODE    100.00 =    1763.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       19.1  TC(MIN.) =     16.87
 EFFECTIVE AREA(ACRES) =     17.52  AREA-AVERAGED Fm(INCH/HR)=  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap = 0.140
 PEAK FLOW RATE(CFS)   =      18.44

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       15.26    6.83    2.101  0.81( 0.12) 0.15       8.0     134.00
     2       16.63   10.09    1.663  0.81( 0.12) 0.15      11.3     116.00
     3       18.44   16.87    1.221  0.81( 0.11) 0.14      17.5     110.00
     4       17.87   18.55    1.154  0.81( 0.11) 0.14      18.1     124.00
     5        7.03   83.10    0.469  0.81( 0.14) 0.18      19.1     128.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1734

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* POST-DEVELOPMENT CONDITIONS                                           *
* 100-YR EVENT                                                          *
* PROLOGIS DISTRIBUTION CENTER                                          *
 ************************************************************************

  FILE NAME: C:\AES\PROL\PROLPR.DAT
  TIME/DATE OF STUDY: 15:57 07/25/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.850
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.250
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) = 1.2500
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   30.0     20.0    0.018/0.018/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```

```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    108.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   127.00
  ELEVATION DATA: UPSTREAM(FEET) =    679.00  DOWNSTREAM(FEET) =    674.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.462
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.265
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       C        0.18      0.27     0.600    86    5.46
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.84
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.84

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.00  DOWNSTREAM(FEET) =    668.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   613.00   CHANNEL SLOPE =  0.0098
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.424
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.83      0.27     0.100    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.78
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   5.73
  Tc(MIN.) =   11.19
  SUBAREA AREA(ACRES) =     2.83       SUBAREA RUNOFF(CFS) =    8.64
  EFFECTIVE AREA(ACRES) =      3.01     AREA-AVERAGED Fm(INCH/HR) =   0.04
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.13
  TOTAL AREA(ACRES) =        3.0         PEAK FLOW RATE(CFS) =       9.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   2.14
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    106.00 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   664.34  DOWNSTREAM(FEET) =   661.45
  FLOW LENGTH(FEET) =   578.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.31
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.18
  PIPE TRAVEL TIME(MIN.) =   1.81    Tc(MIN.) =   13.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =    1318.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   13.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.129
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        6.39      0.27      0.100    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    6.39      SUBAREA RUNOFF(CFS) =   17.85
  EFFECTIVE AREA(ACRES) =      9.40   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        9.4       PEAK FLOW RATE(CFS) =      26.23

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   661.36  DOWNSTREAM(FEET) =   659.95
  FLOW LENGTH(FEET) =   281.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.86
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.23
  PIPE TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =   13.68
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1599.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    122.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  ELEVATION DATA: UPSTREAM(FEET) =    675.00  DOWNSTREAM(FEET) =    673.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.232
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.402
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.10      0.27     0.400    86    5.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.10   PEAK FLOW RATE(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    120.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    673.40  DOWNSTREAM(FEET) =    669.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.00   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.107
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                C        5.93      0.27     0.100    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.74
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   7.93
  Tc(MIN.) =   13.16
  SUBAREA AREA(ACRES) =     5.93       SUBAREA RUNOFF(CFS) =   16.43
  EFFECTIVE AREA(ACRES) =      6.03     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.11
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      16.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   2.16
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    120.00 =     922.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   663.12  DOWNSTREAM(FEET) =   663.00
  FLOW LENGTH(FEET) =     3.10   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.31
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.71
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =   13.16
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    118.00 =     925.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   663.00  DOWNSTREAM(FEET) =   661.36
  FLOW LENGTH(FEET) =   328.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.20
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.71
  PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =   14.04
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    112.00 =    1253.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =   14.04
  RAINFALL INTENSITY(INCH/HR) =   2.99
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.11
  EFFECTIVE STREAM AREA(ACRES) =       6.03
  TOTAL STREAM AREA(ACRES) =       6.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.71

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    114.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    670.75  DOWNSTREAM(FEET) =    667.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.552
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        0.15      0.27     0.100    86    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.74
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.74

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  667.80  DOWNSTREAM ELEVATION(FEET) =  666.00
  STREET LENGTH(FEET) =   331.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  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 =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.26
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   11.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.57
  STREET FLOW TRAVEL TIME(MIN.) =   3.26   Tc(MIN.) =    8.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.109
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               C        0.83      0.27     0.350    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.83      SUBAREA RUNOFF(CFS) =    3.00
  EFFECTIVE AREA(ACRES) =      0.98    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        1.0       PEAK FLOW RATE(CFS) =       3.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  14.02
  FLOW VELOCITY(FEET/SEC.) =  1.88   DEPTH*VELOCITY(FT*FT/SEC.) =   0.72
  LONGEST FLOWPATH FROM NODE    116.00 TO NODE    112.00 =     456.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =    8.26
  RAINFALL INTENSITY(INCH/HR) =   4.11
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =       0.98
  TOTAL STREAM AREA(ACRES) =       0.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.55

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       16.71   14.04    2.988  0.27( 0.03) 0.11       6.0     124.00
      2        3.55    8.26    4.109  0.27( 0.08) 0.31       1.0     116.00

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

  ** PEAK FLOW RATE TABLE **
```

```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.09    8.26    4.109  0.27( 0.04) 0.15       4.5     116.00
      2       19.27   14.04    2.988  0.27( 0.04) 0.13       7.0     124.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.27    Tc(MIN.) =    14.04
  EFFECTIVE AREA(ACRES) =       7.01   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =        7.0
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    112.00 =    1253.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   661.36  DOWNSTREAM(FEET) =   660.48
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.36
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.27
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   14.50
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    130.00 =    1429.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =   14.50
  RAINFALL INTENSITY(INCH/HR) =   2.93
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.13
  EFFECTIVE STREAM AREA(ACRES) =       7.01
  TOTAL STREAM AREA(ACRES) =       7.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.27

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    132.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    672.00  DOWNSTREAM(FEET) =    668.70

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.260
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.385
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               C        0.12      0.27     0.350    86    5.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.58
 TOTAL AREA(ACRES) =      0.12   PEAK FLOW RATE(CFS) =      0.58

****************************************************************************
 FLOW PROCESS FROM NODE    132.00 TO NODE    130.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  668.70  DOWNSTREAM ELEVATION(FEET) =  665.40
 STREET LENGTH(FEET) =   169.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 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 =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.44
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.32
   HALFSTREET FLOOD WIDTH(FEET) =   10.59
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
 STREET FLOW TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =    6.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.887
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 APARTMENTS                 C        1.31      0.27     0.200    86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
 SUBAREA AREA(ACRES) =    1.31      SUBAREA RUNOFF(CFS) =    5.71
 EFFECTIVE AREA(ACRES) =      1.43    AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.21
```

```
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       6.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  13.55
  FLOW VELOCITY(FEET/SEC.) =  3.51   DEPTH*VELOCITY(FT*FT/SEC.) =   1.31
  LONGEST FLOWPATH FROM NODE    134.00 TO NODE    130.00 =     299.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =    6.18
  RAINFALL INTENSITY(INCH/HR) =   4.89
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.21
  EFFECTIVE STREAM AREA(ACRES) =       1.43
  TOTAL STREAM AREA(ACRES) =       1.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.23

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.09    8.73    3.974  0.27( 0.04) 0.15       4.5     116.00
      1       19.27   14.50    2.930  0.27( 0.04) 0.13       7.0     124.00
      2        6.23    6.18    4.887  0.27( 0.06) 0.21       1.4     134.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       21.15    6.18    4.887  0.27( 0.05) 0.17       4.6     134.00
      2       22.15    8.73    3.974  0.27( 0.04) 0.17       6.0     116.00
      3       22.97   14.50    2.930  0.27( 0.04) 0.15       8.4     124.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      22.97    Tc(MIN.) =    14.50
  EFFECTIVE AREA(ACRES) =       8.44   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =        8.4
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    130.00 =    1429.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    102.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   660.48  DOWNSTREAM(FEET) =   659.95
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  19.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.73
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.97
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   14.76
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    102.00 =    1534.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       21.15    6.46    4.763  0.27( 0.05) 0.17       4.6     134.00
      2       22.15    9.00    3.902  0.27( 0.04) 0.17       6.0     116.00
      3       22.97   14.76    2.899  0.27( 0.04) 0.15       8.4     124.00
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    102.00 =    1534.10 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       26.23   13.68    3.035  0.27( 0.03) 0.11       9.4     110.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1599.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       40.65    6.46    4.763  0.27( 0.04) 0.14       9.1     134.00
      2       44.38    9.00    3.902  0.27( 0.04) 0.14      12.1     116.00
      3       49.05   13.68    3.035  0.27( 0.03) 0.13      17.4     110.00
      4       48.02   14.76    2.899  0.27( 0.03) 0.13      17.8     124.00
    TOTAL AREA(ACRES) =        17.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       49.05  Tc(MIN.) =   13.683
  EFFECTIVE AREA(ACRES) =     17.38  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =       17.8
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1599.00 FEET.

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

```
  FLOW PROCESS FROM NODE    102.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   659.95  DOWNSTREAM(FEET) =   659.70
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.23
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.05
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   13.77
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    100.00 =    1644.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   13.77
  RAINFALL INTENSITY(INCH/HR) =   3.02
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.13
  EFFECTIVE STREAM AREA(ACRES) =      17.38
  TOTAL STREAM AREA(ACRES) =      17.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      49.05

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    126.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   242.00
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    679.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.117
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.113
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         C        0.09      0.27     0.900    86   13.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA RUNOFF(CFS) =      0.22
```

```
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    679.00  DOWNSTREAM(FEET) =    663.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1521.00   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.377
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         C        1.15      0.27     0.900    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.67
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  37.94
  Tc(MIN.) =   51.06
  SUBAREA AREA(ACRES) =     1.15       SUBAREA RUNOFF(CFS) =    1.18
  EFFECTIVE AREA(ACRES) =      1.24     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    100.00 =    1763.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   51.06
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =       1.24
  TOTAL STREAM AREA(ACRES) =       1.24
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.26
```

```
 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       40.65    6.55    4.722  0.27( 0.04) 0.14       9.1     134.00
     1       44.38    9.09    3.878  0.27( 0.04) 0.14      12.1     116.00
     1       49.05   13.77    3.023  0.27( 0.03) 0.13      17.4     110.00
     1       48.02   14.86    2.888  0.27( 0.03) 0.13      17.8     124.00
     2        1.26   51.06    1.377  0.27( 0.24) 0.90       1.2     128.00

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

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       41.29    6.55    4.722  0.27( 0.04) 0.15       9.2     134.00
     2       45.10    9.09    3.878  0.27( 0.04) 0.15      12.4     116.00
     3       49.88   13.77    3.023  0.27( 0.04) 0.14      17.7     110.00
     4       48.88   14.86    2.888  0.27( 0.04) 0.14      18.2     124.00
     5       23.85   51.06    1.377  0.27( 0.05) 0.18      19.1     128.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      49.88    Tc(MIN.) =    13.77
 EFFECTIVE AREA(ACRES) =      17.72   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.14
 TOTAL AREA(ACRES) =       19.1
 LONGEST FLOWPATH FROM NODE    128.00 TO NODE    100.00 =    1763.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =       19.1  TC(MIN.) =     13.77
 EFFECTIVE AREA(ACRES) =     17.72  AREA-AVERAGED Fm(INCH/HR)=  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap = 0.143
 PEAK FLOW RATE(CFS)    =      49.88

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       41.29    6.55    4.722  0.27( 0.04) 0.15       9.2     134.00
     2       45.10    9.09    3.878  0.27( 0.04) 0.15      12.4     116.00
     3       49.88   13.77    3.023  0.27( 0.04) 0.14      17.7     110.00
     4       48.88   14.86    2.888  0.27( 0.04) 0.14      18.2     124.00
     5       23.85   51.06    1.377  0.27( 0.05) 0.18      19.1     128.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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

```
 ************************* DESCRIPTION OF STUDY *************************
* MITIGATED: POST-DEVELOPMENT CONDITIONS                                 *
* 100-YR EVENT                                                           *
* PROLOGIS DISTRIBUTION CENTER                                           *
 **************************************************************************

  FILE NAME: C:\AES\PROL\PROLMIT.DAT
  TIME/DATE OF STUDY: 13:48 07/27/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.850
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.250
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) = 1.2500
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   30.0     20.0    0.018/0.018/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
```

```
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    108.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   127.00
  ELEVATION DATA: UPSTREAM(FEET) =    679.00  DOWNSTREAM(FEET) =    674.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.462
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.265
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       C        0.18      0.27     0.600    86    5.46
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA RUNOFF(CFS) =      0.84
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.84

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    674.00  DOWNSTREAM(FEET) =    668.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   613.00   CHANNEL SLOPE =  0.0098
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.424
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        2.83      0.27     0.100    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.78
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   5.73
  Tc(MIN.) =   11.19
  SUBAREA AREA(ACRES) =     2.83       SUBAREA RUNOFF(CFS) =    8.64
  EFFECTIVE AREA(ACRES) =      3.01     AREA-AVERAGED Fm(INCH/HR) =   0.04
```

```
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.13
  TOTAL AREA(ACRES) =        3.0         PEAK FLOW RATE(CFS) =       9.18

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   2.14
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    106.00 =     740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   664.34  DOWNSTREAM(FEET) =   661.45
  FLOW LENGTH(FEET) =   578.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.31
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.18
  PIPE TRAVEL TIME(MIN.) =   1.81    Tc(MIN.) =   13.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =    1318.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   13.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.129
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        6.39      0.27     0.100    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    6.39      SUBAREA RUNOFF(CFS) =   17.85
  EFFECTIVE AREA(ACRES) =      9.40   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        9.4       PEAK FLOW RATE(CFS) =      26.23

+----------------------------------------------------------------------------+
| USER SPECIFIED MITIGATED FLOW                                              |
| RUNOFF ROUTED TO BMP-1, UNDERGROUND DETENTION CHAMBERS                     |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
```

```
==========================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN.) =   13.00   RAINFALL INTENSITY(INCH/HR) =  3.13
  EFFECTIVE AREA(ACRES) =     9.40
  TOTAL AREA(ACRES) =     9.40        PEAK FLOW RATE(CFS) =      9.95
  AREA-AVERAGED Fm(INCH/HR) =   0.03  AREA-AVERAGED Fp(INCH/HR) =   0.27
  AREA-AVERAGED Ap =  0.11
  NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
        CONFLUENCE ANALYSES.

**************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    102.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   661.36  DOWNSTREAM(FEET) =   659.95
  FLOW LENGTH(FEET) =   281.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.39
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.95
  PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =   13.87
  LONGEST FLOWPATH FROM NODE    104.00 TO NODE    102.00 =    1599.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  10
--------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    122.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  ELEVATION DATA: UPSTREAM(FEET) =    675.00  DOWNSTREAM(FEET) =    673.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.232
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.402
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.10      0.27     0.400    86    5.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
```

```
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.10   PEAK FLOW RATE(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    120.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    673.40  DOWNSTREAM(FEET) =    669.21
  CHANNEL LENGTH THRU SUBAREA(FEET) =   827.00   CHANNEL SLOPE =  0.0051
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.107
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C        5.93      0.27     0.100    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.74
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   7.93
  Tc(MIN.) =   13.16
  SUBAREA AREA(ACRES) =     5.93       SUBAREA RUNOFF(CFS) =   16.43
  EFFECTIVE AREA(ACRES) =      6.03     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.11
  TOTAL AREA(ACRES) =        6.0         PEAK FLOW RATE(CFS) =      16.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   2.16
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    120.00 =     922.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   663.12  DOWNSTREAM(FEET) =   663.00
  FLOW LENGTH(FEET) =     3.10   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.31
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.71
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =   13.16
  LONGEST FLOWPATH FROM NODE    124.00 TO NODE    118.00 =     925.10 FEET.

+--------------------------------------------------------------------------+
| USER SPECIFIED MITIGATED FLOW                                            |
```

```
| RUNOFF ROUTED TO BMP-2, UNDERGROUND DETENTION CHAMBERS                  |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN.) =   13.16   RAINFALL INTENSITY(INCH/HR) =  3.11
  EFFECTIVE AREA(ACRES) =     6.03
  TOTAL AREA(ACRES) =     6.03        PEAK FLOW RATE(CFS) =      6.76
  AREA-AVERAGED Fm(INCH/HR) =   0.03  AREA-AVERAGED Fp(INCH/HR) =   0.27
  AREA-AVERAGED Ap =  0.11
  NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
        CONFLUENCE ANALYSES.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   663.00  DOWNSTREAM(FEET) =   661.36
  FLOW LENGTH(FEET) =   328.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.76
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =   14.28
  LONGEST FLOWPATH FROM NODE    118.00 TO NODE    112.00 =    1253.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =   14.28
  RAINFALL INTENSITY(INCH/HR) =   2.96
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.11
  EFFECTIVE STREAM AREA(ACRES) =       6.03
  TOTAL STREAM AREA(ACRES) =       6.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.76

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

```
 FLOW PROCESS FROM NODE    116.00 TO NODE    114.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
 ELEVATION DATA: UPSTREAM(FEET) =    670.75  DOWNSTREAM(FEET) =    667.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.552
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 C        0.15      0.27     0.100    86    5.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.74
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.74

****************************************************************************
 FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  667.80  DOWNSTREAM ELEVATION(FEET) =  666.00
 STREET LENGTH(FEET) =   331.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

 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 =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.26
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   11.60
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.69
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.57
 STREET FLOW TRAVEL TIME(MIN.) =   3.26   Tc(MIN.) =    8.26
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.109
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  CONDOMINIUMS                C        0.83      0.27     0.350    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.83      SUBAREA RUNOFF(CFS) =    3.00
  EFFECTIVE AREA(ACRES) =      0.98    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       3.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  14.02
  FLOW VELOCITY(FEET/SEC.) =  1.88   DEPTH*VELOCITY(FT*FT/SEC.) =   0.72
  LONGEST FLOWPATH FROM NODE    116.00 TO NODE    112.00 =     456.00 FEET.

+----------------------------------------------------------------------------+
| USER SPECIFIED MITIGATED FLOW                                              |
| RUNOFF ROUTED TO BMP-3, BIOFILTRATION PLANTER                              |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN.) =    8.26   RAINFALL INTENSITY(INCH/HR) =  4.11
  EFFECTIVE AREA(ACRES) =     0.98
  TOTAL AREA(ACRES) =     0.98       PEAK FLOW RATE(CFS) =      1.33
  AREA-AVERAGED Fm(INCH/HR) =   0.08  AREA-AVERAGED Fp(INCH/HR) =   0.27
  AREA-AVERAGED Ap =  0.31
  NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
        CONFLUENCE ANALYSES.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 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.) =    8.26
  RAINFALL INTENSITY(INCH/HR) =   4.11
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =       0.98
  TOTAL STREAM AREA(ACRES) =       0.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.33
```

```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.76   14.28    2.958  0.27( 0.03) 0.11       6.0     118.00
      2        1.33    8.26    4.108  0.27( 0.08) 0.31       1.0     112.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.78    8.26    4.108  0.27( 0.04) 0.15       4.5     112.00
      2        7.71   14.28    2.958  0.27( 0.04) 0.14       7.0     118.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.71    Tc(MIN.) =    14.28
  EFFECTIVE AREA(ACRES) =       7.01   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =        7.0
  LONGEST FLOWPATH FROM NODE    118.00 TO NODE    112.00 =    1253.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   661.36  DOWNSTREAM(FEET) =   660.48
  FLOW LENGTH(FEET) =   176.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.13
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.71
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   14.85
  LONGEST FLOWPATH FROM NODE    118.00 TO NODE    130.00 =    1429.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =   14.85
  RAINFALL INTENSITY(INCH/HR) =   2.89
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.14
  EFFECTIVE STREAM AREA(ACRES) =       7.01
```

```
  TOTAL STREAM AREA(ACRES) =       7.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.71

****************************************************************************
  FLOW PROCESS FROM NODE    134.00 TO NODE    132.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
  ELEVATION DATA: UPSTREAM(FEET) =    672.00  DOWNSTREAM(FEET) =    668.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.260
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.385
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               C        0.12      0.27     0.350    86    5.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.12   PEAK FLOW RATE(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    130.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  668.70  DOWNSTREAM ELEVATION(FEET) =  665.40
  STREET LENGTH(FEET) =   169.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  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 =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.44
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =   10.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
  STREET FLOW TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =    6.18
```

```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.887
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  APARTMENTS                  C        1.31      0.27      0.200    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA AREA(ACRES) =    1.31      SUBAREA RUNOFF(CFS) =    5.71
  EFFECTIVE AREA(ACRES) =      1.43    AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.21
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       6.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  13.55
  FLOW VELOCITY(FEET/SEC.) =  3.51   DEPTH*VELOCITY(FT*FT/SEC.) =   1.31
  LONGEST FLOWPATH FROM NODE    134.00 TO NODE    130.00 =     299.00 FEET.

+----------------------------------------------------------------------------+
| USER SPECIFIED MITIGATED FLOW                                              |
| RUNOFF ROUTED TO BMP-4, BIOFILTRATION PLANTER                              |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN.) =    6.18   RAINFALL INTENSITY(INCH/HR) =  4.89
  EFFECTIVE AREA(ACRES) =     1.43
  TOTAL AREA(ACRES) =     1.43        PEAK FLOW RATE(CFS) =      3.94
  AREA-AVERAGED Fm(INCH/HR) =   0.06  AREA-AVERAGED Fp(INCH/HR) =   0.27
  AREA-AVERAGED Ap =  0.21
  NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
        CONFLUENCE ANALYSES.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 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.) =    6.18
  RAINFALL INTENSITY(INCH/HR) =   4.89
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.21
```

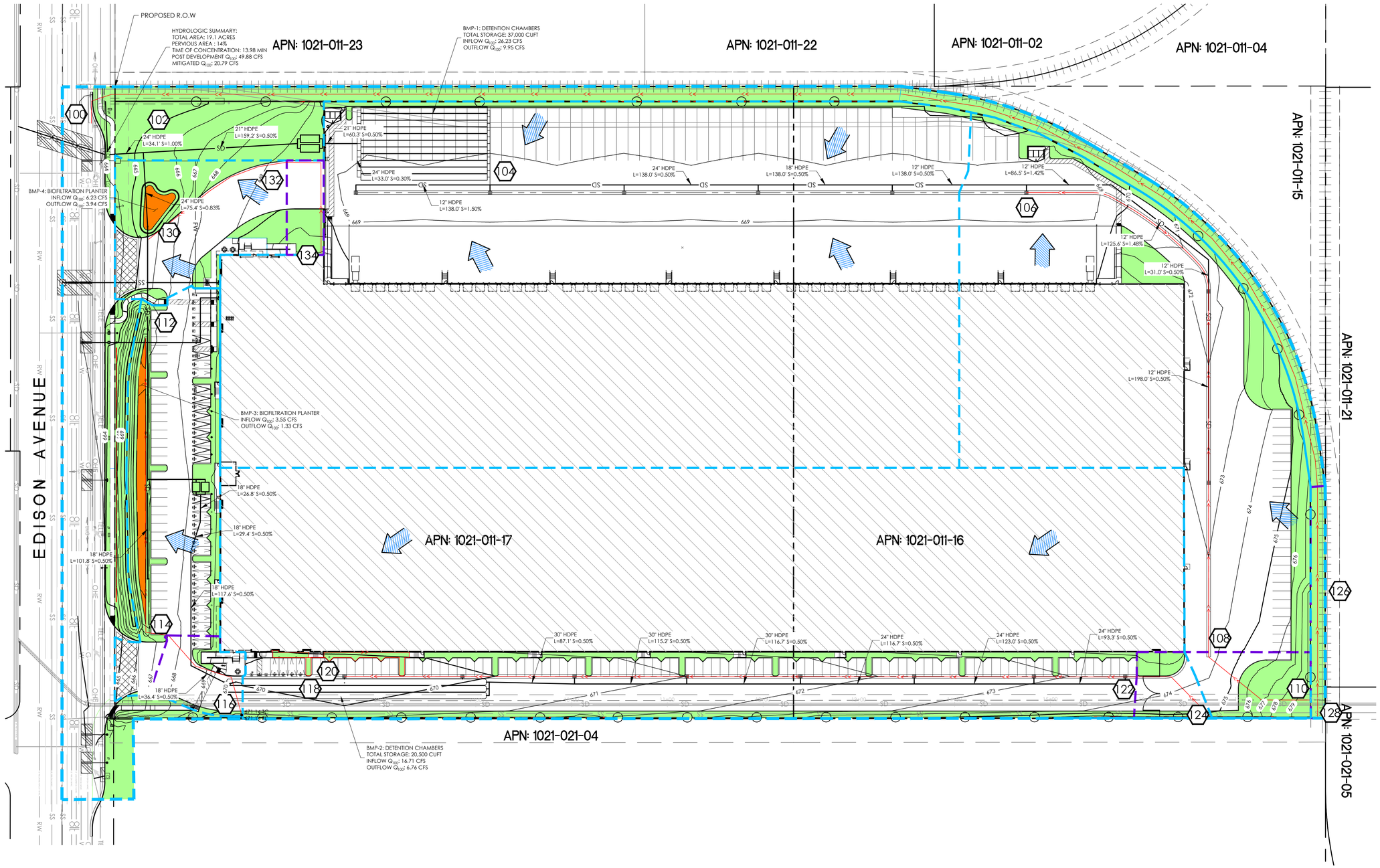
```
  EFFECTIVE STREAM AREA(ACRES) =       1.43
  TOTAL STREAM AREA(ACRES) =       1.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.94

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.78    8.86    3.938  0.27( 0.04) 0.15       4.5     112.00
      1        7.71   14.85    2.889  0.27( 0.04) 0.14       7.0     118.00
      2        3.94    6.18    4.889  0.27( 0.06) 0.21       1.4     130.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.82    6.18    4.889  0.27( 0.05) 0.17       4.5     130.00
      2        9.94    8.86    3.938  0.27( 0.05) 0.17       5.9     112.00
      3       10.02   14.85    2.889  0.27( 0.04) 0.15       8.4     118.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.02    Tc(MIN.) =    14.85
  EFFECTIVE AREA(ACRES) =       8.44   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =        8.4
  LONGEST FLOWPATH FROM NODE    118.00 TO NODE    130.00 =    1429.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   660.48  DOWNSTREAM(FEET) =   659.95
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.42
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.02
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   15.17
  LONGEST FLOWPATH FROM NODE    118.00 TO NODE    102.00 =    1534.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

```
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1        9.82    6.50    4.741  0.27( 0.05) 0.17       4.5     130.00
    2        9.94    9.18    3.854  0.27( 0.05) 0.17       5.9     112.00
    3       10.02   15.17    2.852  0.27( 0.04) 0.15       8.4     118.00
LONGEST FLOWPATH FROM NODE    118.00 TO NODE    102.00 =    1534.10 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1        9.95   13.87    3.010  0.27( 0.03) 0.11       9.4     104.00
LONGEST FLOWPATH FROM NODE    104.00 TO NODE    102.00 =    1599.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1       17.20    6.50    4.741  0.27( 0.04) 0.14       9.0     130.00
    2       18.40    9.18    3.854  0.27( 0.04) 0.14      12.1     112.00
    3       19.95   13.87    3.010  0.27( 0.04) 0.13      17.3     104.00
    4       19.44   15.17    2.852  0.27( 0.03) 0.13      17.8     118.00
  TOTAL AREA(ACRES) =        17.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =       19.95  Tc(MIN.) =   13.868
EFFECTIVE AREA(ACRES) =     17.29  AREA-AVERAGED Fm(INCH/HR) =  0.04
AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.13
TOTAL AREA(ACRES) =       17.8
LONGEST FLOWPATH FROM NODE    104.00 TO NODE    102.00 =    1599.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   659.95  DOWNSTREAM(FEET) =   659.70
 FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.69
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      19.95
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   13.98
 LONGEST FLOWPATH FROM NODE    104.00 TO NODE    100.00 =    1644.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   13.98
  RAINFALL INTENSITY(INCH/HR) =   3.00
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.13
  EFFECTIVE STREAM AREA(ACRES) =      17.29
  TOTAL STREAM AREA(ACRES) =      17.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.95

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    126.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   242.00
  ELEVATION DATA: UPSTREAM(FEET) =    680.00  DOWNSTREAM(FEET) =    679.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.117
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.113
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  ".4 DWELLING/ACRE"         C        0.09      0.27     0.900    86   13.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.09   PEAK FLOW RATE(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    679.00  DOWNSTREAM(FEET) =    663.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1521.00   CHANNEL SLOPE =  0.0105
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   0.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.377
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         C        1.15      0.27     0.900    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.900
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.67
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  37.94
  Tc(MIN.) =   51.06
  SUBAREA AREA(ACRES) =     1.15       SUBAREA RUNOFF(CFS) =    1.18
  EFFECTIVE AREA(ACRES) =      1.24     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.27  AREA-AVERAGED Ap =   0.90
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       1.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    100.00 =    1763.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   51.06
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.90
  EFFECTIVE STREAM AREA(ACRES) =       1.24
  TOTAL STREAM AREA(ACRES) =       1.24
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.20    6.62    4.690  0.27( 0.04) 0.14       9.0     130.00
      1       18.40    9.30    3.826  0.27( 0.04) 0.14      12.1     112.00
      1       19.95   13.98    2.996  0.27( 0.04) 0.13      17.3     104.00
      1       19.44   15.29    2.839  0.27( 0.03) 0.13      17.8     118.00
      2        1.26   51.06    1.377  0.27( 0.24) 0.90       1.2     128.00

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.84    6.62    4.690  0.27( 0.04) 0.15       9.1     130.00
      2       19.12    9.30    3.826  0.27( 0.04) 0.15      12.3     112.00
      3       20.79   13.98    2.996  0.27( 0.04) 0.14      17.6     104.00
      4       20.31   15.29    2.839  0.27( 0.04) 0.14      18.2     118.00
      5       10.57   51.06    1.377  0.27( 0.05) 0.18      19.1     128.00
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.79    Tc(MIN.) =    13.98
  EFFECTIVE AREA(ACRES) =      17.62   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =       19.1
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    100.00 =    1763.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       19.1  TC(MIN.) =     13.98
  EFFECTIVE AREA(ACRES) =     17.62  AREA-AVERAGED Fm(INCH/HR)=  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap = 0.145
  PEAK FLOW RATE(CFS)   =      20.79

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.84    6.62    4.690  0.27( 0.04) 0.15       9.1     130.00
      2       19.12    9.30    3.826  0.27( 0.04) 0.15      12.3     112.00
      3       20.79   13.98    2.996  0.27( 0.04) 0.14      17.6     104.00
      4       20.31   15.29    2.839  0.27( 0.04) 0.14      18.2     118.00
      5       10.57   51.06    1.377  0.27( 0.05) 0.18      19.1     128.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```



LEGEND

- (#) DRAINAGE NODE
- DRAINAGE BASIN BOUNDARY
- DRAINAGE BASIN INITIAL SUB-AREA
- SD — PROPOSED PRIVATE HDPE STORM DRAIN
- FLOW PATH
- PERVIOUS AREA
- BIORETENTION AREA
- FLOW DIRECTION

HYDROLOGIC INFORMATION SUMMARY

HSG TYPE: C

DEPTH TO GROUNDWATER: >20 FT

0 50 100 150 feet

1"=50'

PRELIMINARY
POST-DEVELOPMENT HYDROLOGY EXHIBIT
PROLOGIS CHINO EDISON DISTRIBUTION CENTER

H2

January 24, 2025

rrm design group

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Appendix 4 – Detention Calculations

Hydraflow-Hydrographs – BMP-1

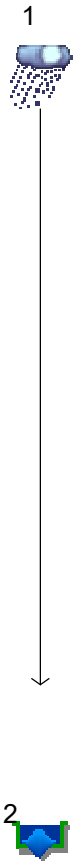
Hydraflow-Hydrographs – BMP-2

Hydraflow-Hydrographs – BMP-3

Hydraflow-Hydrographs – BMP-4

Watershed Model Schematic

BMP 1



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	26.23	PR100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	9.949	PR 100 Mitigated

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

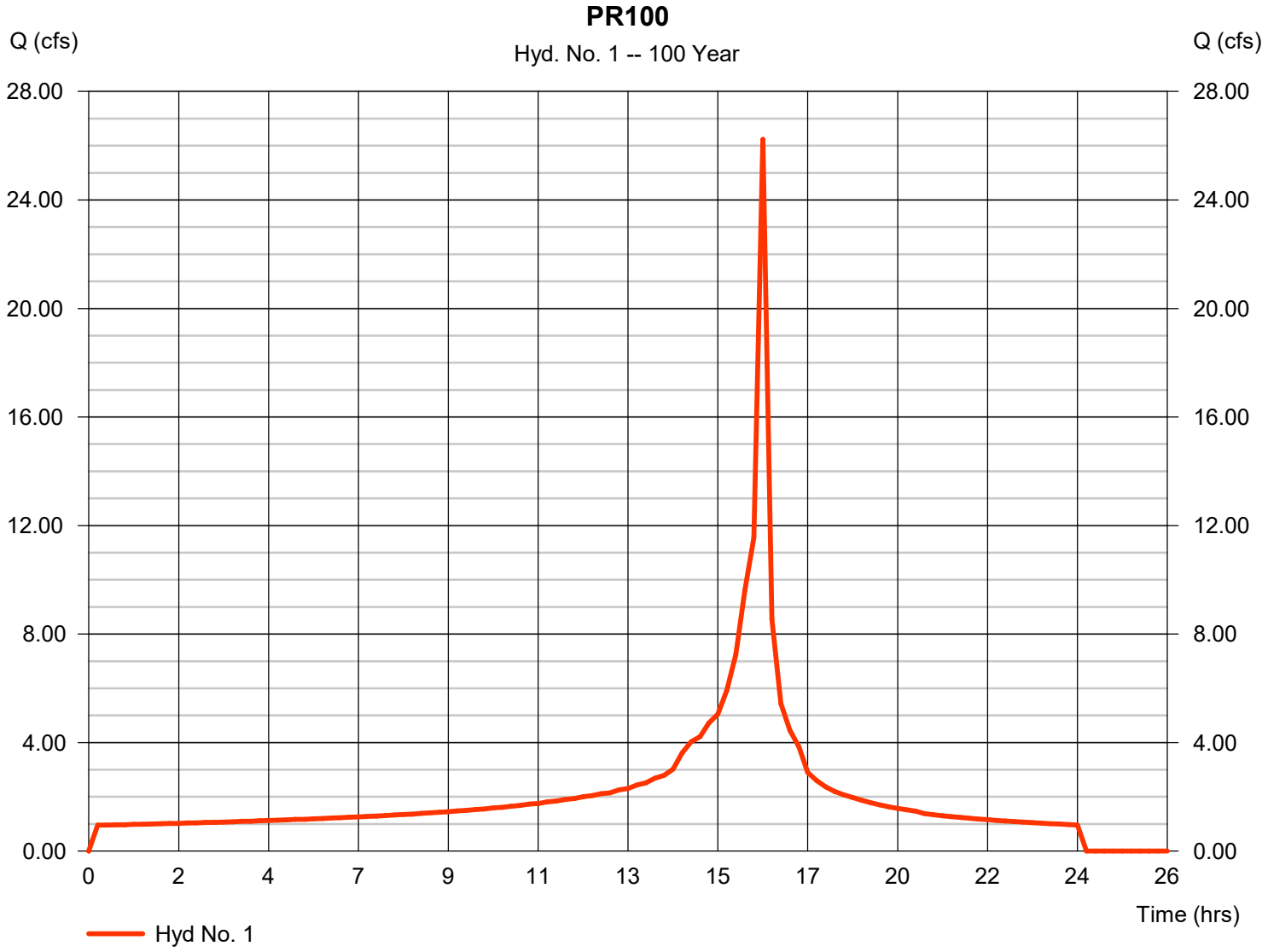
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	26.23	13	975	192,496	------	------	------	PR100
2	Reservoir	9.949	13	988	190,094	1	664.82	36,434	PR 100 Mitigated

Hydrograph Report

Hyd. No. 1

PR100

Hydrograph type	=	Manual	Peak discharge	=	26.23 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.25 hrs
Time interval	=	13 min	Hyd. volume	=	192,496 cuft



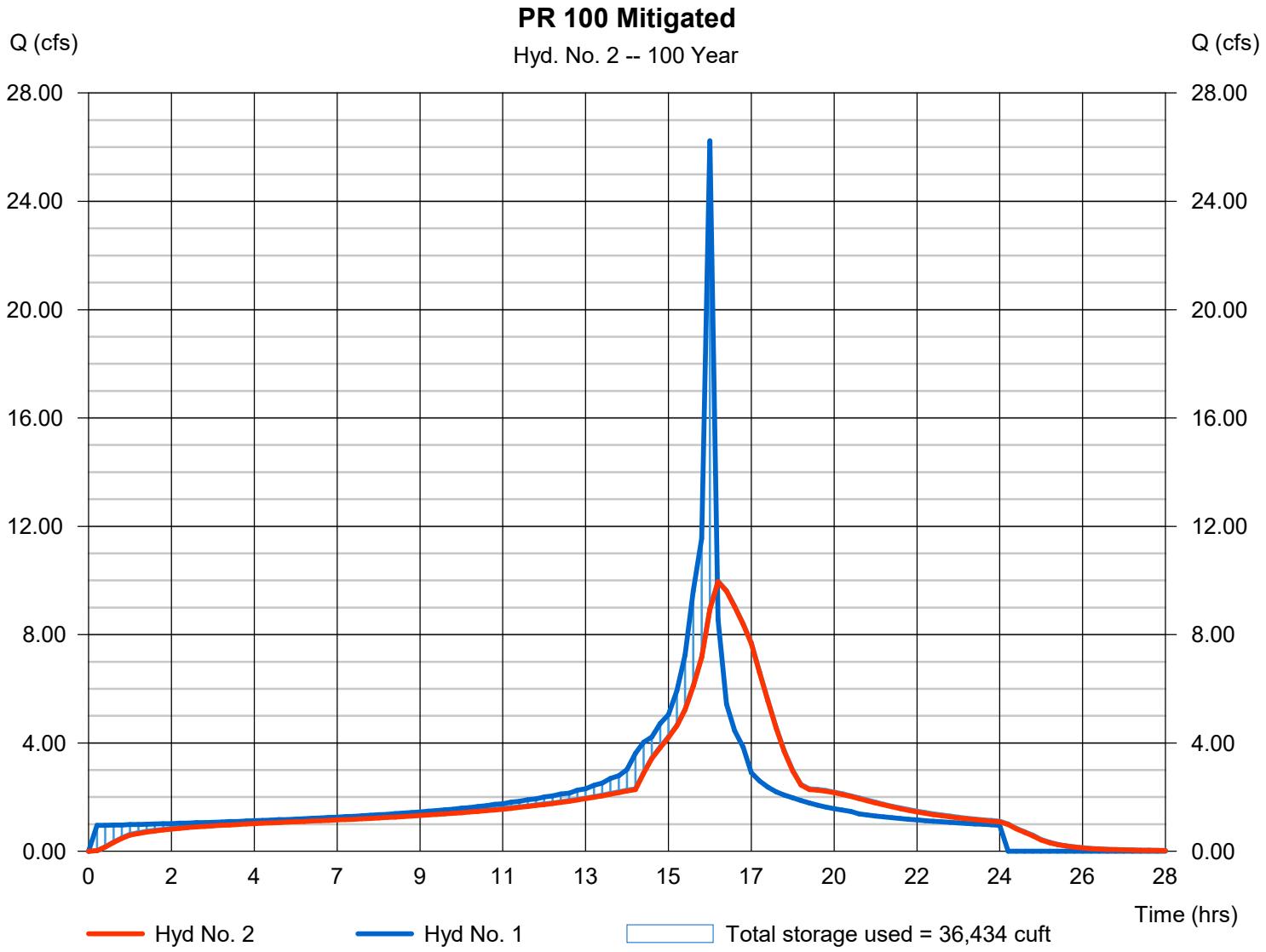
Hydrograph Report

Hyd. No. 2

PR 100 Mitigated

Hydrograph type	=	Reservoir	Peak discharge	=	9.949 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.47 hrs
Time interval	=	13 min	Hyd. volume	=	190,094 cuft
Inflow hyd. No.	=	1 - PR100	Max. Elevation	=	664.82 ft
Reservoir name	=	Prinsco HS180	Max. Storage	=	36,434 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - Prinsco HS180

Pond Data

UG Chambers -Invert elev. = 661.36 ft, Rise x Span = 3.70 x 6.50 ft, Barrel Len = 130.00 ft, No. Barrels = 12, Slope = 0.30%, Headers = Yes
Encasement -Invert elev. = 661.36 ft, Width = 6.50 ft, Height = 3.70 ft, Voids = 100.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	661.36	n/a	0	0
0.41	661.77	n/a	2,387	2,387
0.82	662.18	n/a	4,563	6,950
1.23	662.59	n/a	4,563	11,513
1.64	663.00	n/a	4,563	16,076
2.05	663.41	n/a	4,563	20,639
2.45	663.81	n/a	4,563	25,202
2.86	664.22	n/a	4,563	29,764
3.27	664.63	n/a	4,563	34,327
3.68	665.04	n/a	4,563	38,890
4.09	665.45	n/a	4,563	43,453

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.00	0.00	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 661.36	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .012	.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)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.100 (by Contour)
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	661.36	0.00	---	---	---	---	---	---	---	0.000	---	0.000
0.04	239	661.40	0.01 ic	---	---	---	---	---	---	---	0.004	---	0.012
0.08	477	661.44	0.03 ic	---	---	---	---	---	---	---	0.006	---	0.040
0.12	716	661.48	0.07 ic	---	---	---	---	---	---	---	0.009	---	0.083
0.16	955	661.52	0.13 ic	---	---	---	---	---	---	---	0.011	---	0.142
0.20	1,194	661.56	0.20 oc	---	---	---	---	---	---	---	0.013	---	0.212
0.25	1,432	661.61	0.27 oc	---	---	---	---	---	---	---	0.016	---	0.287
0.29	1,671	661.65	0.35 oc	---	---	---	---	---	---	---	0.018	---	0.368
0.33	1,910	661.69	0.43 oc	---	---	---	---	---	---	---	0.021	---	0.453
0.37	2,149	661.73	0.52 oc	---	---	---	---	---	---	---	0.023	---	0.545
0.41	2,387	661.77	0.61 oc	---	---	---	---	---	---	---	0.025	---	0.638
0.45	2,844	661.81	0.71 oc	---	---	---	---	---	---	---	0.025	---	0.733
0.49	3,300	661.85	0.81 oc	---	---	---	---	---	---	---	0.025	---	0.831
0.53	3,756	661.89	0.90 oc	---	---	---	---	---	---	---	0.025	---	0.928
0.57	4,213	661.93	1.00 oc	---	---	---	---	---	---	---	0.025	---	1.029
0.61	4,669	661.97	1.11 oc	---	---	---	---	---	---	---	0.025	---	1.130
0.65	5,125	662.01	1.20 oc	---	---	---	---	---	---	---	0.025	---	1.229
0.70	5,581	662.06	1.31 oc	---	---	---	---	---	---	---	0.025	---	1.330
0.74	6,038	662.10	1.40 oc	---	---	---	---	---	---	---	0.025	---	1.429
0.78	6,494	662.14	1.50 oc	---	---	---	---	---	---	---	0.025	---	1.528
0.82	6,950	662.18	1.60 oc	---	---	---	---	---	---	---	0.025	---	1.624
0.86	7,407	662.22	1.69 oc	---	---	---	---	---	---	---	0.025	---	1.719
0.90	7,863	662.26	1.78 oc	---	---	---	---	---	---	---	0.025	---	1.809
0.94	8,319	662.30	1.87 oc	---	---	---	---	---	---	---	0.025	---	1.897
0.98	8,775	662.34	1.95 oc	---	---	---	---	---	---	---	0.025	---	1.979
1.02	9,232	662.38	2.03 oc	---	---	---	---	---	---	---	0.025	---	2.056
1.06	9,688	662.42	2.10 oc	---	---	---	---	---	---	---	0.025	---	2.127
1.10	10,144	662.46	2.17 oc	---	---	---	---	---	---	---	0.025	---	2.191
1.15	10,601	662.51	2.22 oc	---	---	---	---	---	---	---	0.025	---	2.243
1.19	11,057	662.55	2.26 oc	---	---	---	---	---	---	---	0.025	---	2.284
1.23	11,513	662.59	2.28 oc	---	---	---	---	---	---	---	0.025	---	2.305
1.27	11,969	662.63	2.46 oc	---	---	---	---	---	---	---	0.025	---	2.482

Continues on next page...

Prinsco HS180

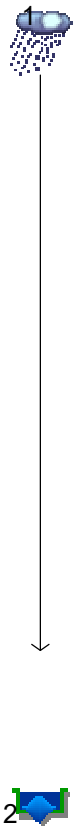
Stage / Storage / Discharge Table

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
1.31	12,426	662.67	2.85 oc	---	---	---	---	---	---	---	0.025	---	2.877
1.35	12,882	662.71	3.20 oc	---	---	---	---	---	---	---	0.025	---	3.223
1.39	13,338	662.75	3.51 oc	---	---	---	---	---	---	---	0.025	---	3.535
1.43	13,794	662.79	3.80 oc	---	---	---	---	---	---	---	0.025	---	3.822
1.47	14,251	662.83	4.06 oc	---	---	---	---	---	---	---	0.025	---	4.089
1.51	14,707	662.87	4.31 oc	---	---	---	---	---	---	---	0.025	---	4.339
1.55	15,163	662.91	4.55 oc	---	---	---	---	---	---	---	0.025	---	4.575
1.60	15,620	662.96	4.78 oc	---	---	---	---	---	---	---	0.025	---	4.800
1.64	16,076	663.00	4.99 oc	---	---	---	---	---	---	---	0.025	---	5.015
1.68	16,532	663.04	5.20 oc	---	---	---	---	---	---	---	0.025	---	5.220
1.72	16,988	663.08	5.39 oc	---	---	---	---	---	---	---	0.025	---	5.418
1.76	17,445	663.12	5.58 oc	---	---	---	---	---	---	---	0.025	---	5.609
1.80	17,901	663.16	5.77 oc	---	---	---	---	---	---	---	0.025	---	5.794
1.84	18,357	663.20	5.95 oc	---	---	---	---	---	---	---	0.025	---	5.972
1.88	18,814	663.24	6.12 oc	---	---	---	---	---	---	---	0.025	---	6.146
1.92	19,270	663.28	6.29 oc	---	---	---	---	---	---	---	0.025	---	6.315
1.96	19,726	663.32	6.45 oc	---	---	---	---	---	---	---	0.025	---	6.479
2.00	20,182	663.36	6.61 oc	---	---	---	---	---	---	---	0.025	---	6.640
2.05	20,639	663.41	6.77 oc	---	---	---	---	---	---	---	0.025	---	6.796
2.09	21,095	663.45	6.92 oc	---	---	---	---	---	---	---	0.025	---	6.949
2.13	21,551	663.49	7.07 oc	---	---	---	---	---	---	---	0.025	---	7.099
2.17	22,008	663.53	7.22 oc	---	---	---	---	---	---	---	0.025	---	7.246
2.21	22,464	663.57	7.36 oc	---	---	---	---	---	---	---	0.025	---	7.389
2.25	22,920	663.61	7.51 oc	---	---	---	---	---	---	---	0.025	---	7.530
2.29	23,376	663.65	7.62 ic	---	---	---	---	---	---	---	0.025	---	7.649
2.33	23,833	663.69	7.72 ic	---	---	---	---	---	---	---	0.025	---	7.742
2.37	24,289	663.73	7.81 ic	---	---	---	---	---	---	---	0.025	---	7.834
2.41	24,745	663.77	7.90 ic	---	---	---	---	---	---	---	0.025	---	7.925
2.45	25,202	663.81	7.99 ic	---	---	---	---	---	---	---	0.025	---	8.015
2.49	25,658	663.85	8.08 ic	---	---	---	---	---	---	---	0.025	---	8.104
2.54	26,114	663.90	8.17 ic	---	---	---	---	---	---	---	0.025	---	8.191
2.58	26,570	663.94	8.25 ic	---	---	---	---	---	---	---	0.025	---	8.278
2.62	27,027	663.98	8.34 ic	---	---	---	---	---	---	---	0.025	---	8.364
2.66	27,483	664.02	8.42 ic	---	---	---	---	---	---	---	0.025	---	8.450
2.70	27,939	664.06	8.51 ic	---	---	---	---	---	---	---	0.025	---	8.534
2.74	28,396	664.10	8.59 ic	---	---	---	---	---	---	---	0.025	---	8.617
2.78	28,852	664.14	8.68 ic	---	---	---	---	---	---	---	0.025	---	8.700
2.82	29,308	664.18	8.76 ic	---	---	---	---	---	---	---	0.025	---	8.782
2.86	29,764	664.22	8.84 ic	---	---	---	---	---	---	---	0.025	---	8.863
2.90	30,221	664.26	8.92 ic	---	---	---	---	---	---	---	0.025	---	8.944
2.94	30,677	664.30	9.00 ic	---	---	---	---	---	---	---	0.025	---	9.023
2.99	31,133	664.35	9.08 ic	---	---	---	---	---	---	---	0.025	---	9.102
3.03	31,590	664.39	9.16 ic	---	---	---	---	---	---	---	0.025	---	9.181
3.07	32,046	664.43	9.23 ic	---	---	---	---	---	---	---	0.025	---	9.258
3.11	32,502	664.47	9.31 ic	---	---	---	---	---	---	---	0.025	---	9.335
3.15	32,958	664.51	9.39 ic	---	---	---	---	---	---	---	0.025	---	9.411
3.19	33,415	664.55	9.46 ic	---	---	---	---	---	---	---	0.025	---	9.487
3.23	33,871	664.59	9.54 ic	---	---	---	---	---	---	---	0.025	---	9.562
3.27	34,327	664.63	9.61 ic	---	---	---	---	---	---	---	0.025	---	9.637
3.31	34,783	664.67	9.69 ic	---	---	---	---	---	---	---	0.025	---	9.711
3.35	35,240	664.71	9.76 ic	---	---	---	---	---	---	---	0.025	---	9.784
3.39	35,696	664.75	9.83 ic	---	---	---	---	---	---	---	0.025	---	9.857
3.44	36,152	664.80	9.90 ic	---	---	---	---	---	---	---	0.025	---	9.930
3.48	36,609	664.84	9.98 ic	---	---	---	---	---	---	---	0.025	---	10.00
3.52	37,065	664.88	10.05 ic	---	---	---	---	---	---	---	0.025	---	10.07
3.56	37,521	664.92	10.12 ic	---	---	---	---	---	---	---	0.025	---	10.14
3.60	37,977	664.96	10.19 ic	---	---	---	---	---	---	---	0.025	---	10.21
3.64	38,434	665.00	10.26 ic	---	---	---	---	---	---	---	0.025	---	10.28
3.68	38,890	665.04	10.33 ic	---	---	---	---	---	---	---	0.025	---	10.35
3.72	39,346	665.08	10.40 ic	---	---	---	---	---	---	---	0.025	---	10.42
3.76	39,803	665.12	10.47 ic	---	---	---	---	---	---	---	0.025	---	10.49
3.80	40,259	665.16	10.53 ic	---	---	---	---	---	---	---	0.025	---	10.56
3.84	40,715	665.20	10.60 ic	---	---	---	---	---	---	---	0.025	---	10.63
3.89	41,171	665.25	10.67 ic	---	---	---	---	---	---	---	0.025	---	10.69
3.93	41,628	665.29	10.73 ic	---	---	---	---	---	---	---	0.025	---	10.76
3.97	42,084	665.33	10.80 ic	---	---	---	---	---	---	---	0.025	---	10.83
4.01	42,540	665.37	10.87 ic	---	---	---	---	---	---	---	0.025	---	10.89
4.05	42,997	665.41	10.93 ic	---	---	---	---	---	---	---	0.025	---	10.96
4.09	43,453	665.45	11.00 ic	---	---	---	---	---	---	---	0.025	---	11.02

...End

Watershed Model Schematic

BMP 2



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	16.71	PR100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	6.757	PR 100 Mitigated

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

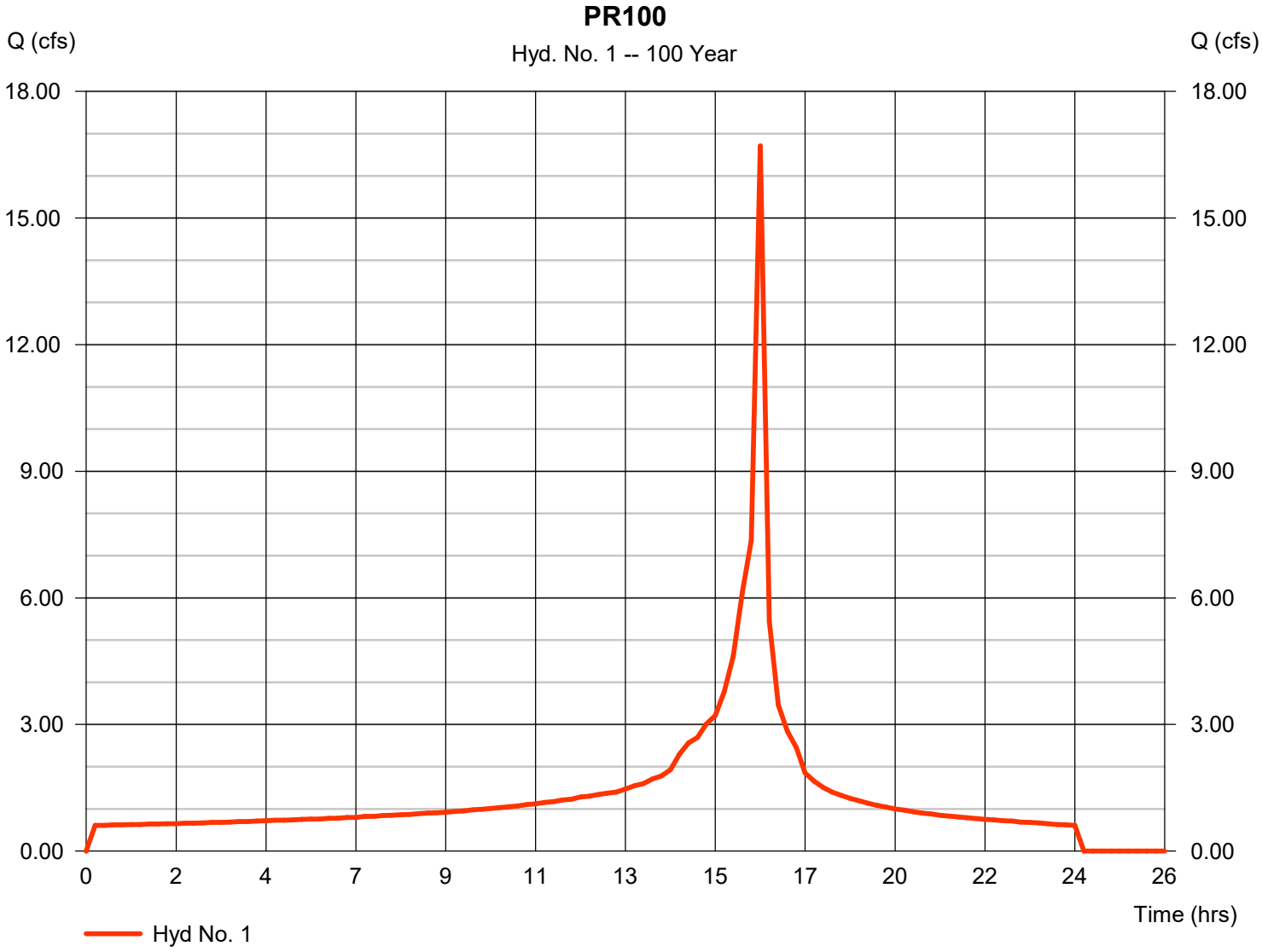
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	16.71	13	975	122,772	------	------	------	PR100
2	Reservoir	6.757	13	988	122,739	1	666.69	20,460	PR 100 Mitigated

Hydrograph Report

Hyd. No. 1

PR100

Hydrograph type	=	Manual	Peak discharge	=	16.71 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.25 hrs
Time interval	=	13 min	Hyd. volume	=	122,772 cuft



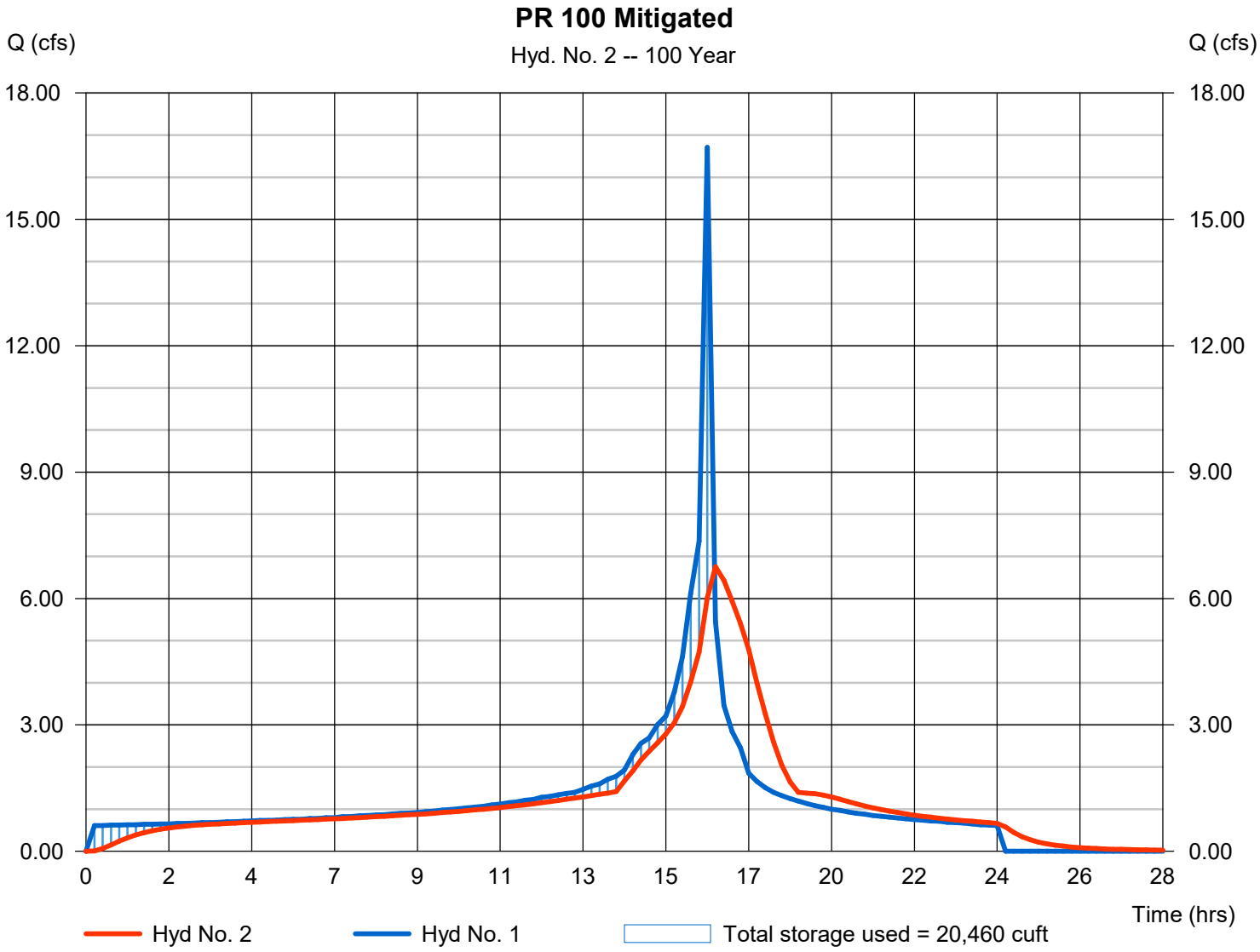
Hydrograph Report

Hyd. No. 2

PR 100 Mitigated

Hydrograph type	=	Reservoir	Peak discharge	=	6.757 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.47 hrs
Time interval	=	13 min	Hyd. volume	=	122,739 cuft
Inflow hyd. No.	=	1 - PR100	Max. Elevation	=	666.69 ft
Reservoir name	=	Prinsco HS180	Max. Storage	=	20,460 cuft

Storage Indication method used.



Pond No. 1 - Prinsco HS180

Pond Data

UG Chambers -Invert elev. = 663.00 ft, Rise x Span = 3.70 x 6.50 ft, Barrel Len = 200.00 ft, No. Barrels = 4, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 663.00 ft, Width = 6.50 ft, Height = 3.70 ft, Voids = 100.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	663.00	n/a	0	0
0.37	663.37	n/a	2,049	2,049
0.74	663.74	n/a	2,049	4,099
1.11	664.11	n/a	2,049	6,148
1.48	664.48	n/a	2,049	8,198
1.85	664.85	n/a	2,049	10,247
2.22	665.22	n/a	2,049	12,297
2.59	665.59	n/a	2,049	14,346
2.96	665.96	n/a	2,049	16,396
3.33	666.33	n/a	2,049	18,445
3.70	666.70	n/a	2,049	20,495

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 663.00	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 0.50	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)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
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	663.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.04	205	663.04	0.01 oc	---	---	---	---	---	---	---	---	---	0.006
0.07	410	663.07	0.02 ic	---	---	---	---	---	---	---	---	---	0.024
0.11	615	663.11	0.05 ic	---	---	---	---	---	---	---	---	---	0.054
0.15	820	663.15	0.09 oc	---	---	---	---	---	---	---	---	---	0.094
0.19	1,025	663.18	0.14 oc	---	---	---	---	---	---	---	---	---	0.141
0.22	1,230	663.22	0.19 oc	---	---	---	---	---	---	---	---	---	0.192
0.26	1,435	663.26	0.25 oc	---	---	---	---	---	---	---	---	---	0.249
0.30	1,640	663.30	0.31 oc	---	---	---	---	---	---	---	---	---	0.310
0.33	1,845	663.33	0.37 oc	---	---	---	---	---	---	---	---	---	0.374
0.37	2,049	663.37	0.44 oc	---	---	---	---	---	---	---	---	---	0.440
0.41	2,254	663.41	0.51 oc	---	---	---	---	---	---	---	---	---	0.508
0.44	2,459	663.44	0.58 oc	---	---	---	---	---	---	---	---	---	0.578
0.48	2,664	663.48	0.65 oc	---	---	---	---	---	---	---	---	---	0.648
0.52	2,869	663.52	0.72 oc	---	---	---	---	---	---	---	---	---	0.719
0.56	3,074	663.55	0.79 oc	---	---	---	---	---	---	---	---	---	0.791
0.59	3,279	663.59	0.86 oc	---	---	---	---	---	---	---	---	---	0.860
0.63	3,484	663.63	0.93 oc	---	---	---	---	---	---	---	---	---	0.929
0.67	3,689	663.67	1.00 oc	---	---	---	---	---	---	---	---	---	0.996
0.70	3,894	663.70	1.06 oc	---	---	---	---	---	---	---	---	---	1.060
0.74	4,099	663.74	1.12 oc	---	---	---	---	---	---	---	---	---	1.123
0.78	4,304	663.78	1.18 oc	---	---	---	---	---	---	---	---	---	1.181
0.81	4,509	663.81	1.24 oc	---	---	---	---	---	---	---	---	---	1.236
0.85	4,714	663.85	1.28 oc	---	---	---	---	---	---	---	---	---	1.285
0.89	4,919	663.89	1.33 oc	---	---	---	---	---	---	---	---	---	1.327
0.93	5,124	663.92	1.36 oc	---	---	---	---	---	---	---	---	---	1.361
0.96	5,329	663.96	1.38 oc	---	---	---	---	---	---	---	---	---	1.382
1.00	5,534	664.00	1.37 oc	---	---	---	---	---	---	---	---	---	1.374
1.04	5,738	664.04	1.60 oc	---	---	---	---	---	---	---	---	---	1.596
1.07	5,943	664.07	1.80 oc	---	---	---	---	---	---	---	---	---	1.800
1.11	6,148	664.11	1.98 oc	---	---	---	---	---	---	---	---	---	1.983
1.15	6,353	664.15	2.15 oc	---	---	---	---	---	---	---	---	---	2.151

Continues on next page...

Prinsco HS180

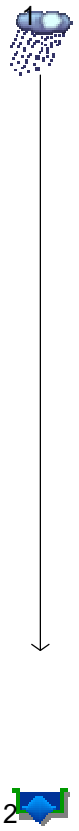
Stage / Storage / Discharge Table

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
1.18	6,558	664.18	2.31 oc	---	---	---	---	---	---	---	---	---	2.307
1.22	6,763	664.22	2.45 oc	---	---	---	---	---	---	---	---	---	2.452
1.26	6,968	664.26	2.59 oc	---	---	---	---	---	---	---	---	---	2.590
1.30	7,173	664.29	2.72 oc	---	---	---	---	---	---	---	---	---	2.720
1.33	7,378	664.33	2.84 oc	---	---	---	---	---	---	---	---	---	2.845
1.37	7,583	664.37	2.96 oc	---	---	---	---	---	---	---	---	---	2.964
1.41	7,788	664.41	3.08 oc	---	---	---	---	---	---	---	---	---	3.079
1.44	7,993	664.44	3.19 oc	---	---	---	---	---	---	---	---	---	3.189
1.48	8,198	664.48	3.30 oc	---	---	---	---	---	---	---	---	---	3.296
1.52	8,403	664.52	3.40 oc	---	---	---	---	---	---	---	---	---	3.400
1.55	8,608	664.55	3.50 oc	---	---	---	---	---	---	---	---	---	3.500
1.59	8,813	664.59	3.60 oc	---	---	---	---	---	---	---	---	---	3.598
1.63	9,018	664.63	3.69 oc	---	---	---	---	---	---	---	---	---	3.693
1.67	9,223	664.66	3.79 oc	---	---	---	---	---	---	---	---	---	3.786
1.70	9,427	664.70	3.88 oc	---	---	---	---	---	---	---	---	---	3.876
1.74	9,632	664.74	3.96 oc	---	---	---	---	---	---	---	---	---	3.965
1.78	9,837	664.78	4.05 oc	---	---	---	---	---	---	---	---	---	4.051
1.81	10,042	664.81	4.14 oc	---	---	---	---	---	---	---	---	---	4.136
1.85	10,247	664.85	4.22 oc	---	---	---	---	---	---	---	---	---	4.219
1.89	10,452	664.89	4.30 oc	---	---	---	---	---	---	---	---	---	4.300
1.92	10,657	664.92	4.38 oc	---	---	---	---	---	---	---	---	---	4.380
1.96	10,862	664.96	4.46 oc	---	---	---	---	---	---	---	---	---	4.459
2.00	11,067	665.00	4.54 oc	---	---	---	---	---	---	---	---	---	4.536
2.04	11,272	665.03	4.61 oc	---	---	---	---	---	---	---	---	---	4.611
2.07	11,477	665.07	4.69 oc	---	---	---	---	---	---	---	---	---	4.686
2.11	11,682	665.11	4.76 oc	---	---	---	---	---	---	---	---	---	4.759
2.15	11,887	665.15	4.83 oc	---	---	---	---	---	---	---	---	---	4.832
2.18	12,092	665.18	4.90 oc	---	---	---	---	---	---	---	---	---	4.903
2.22	12,297	665.22	4.96 ic	---	---	---	---	---	---	---	---	---	4.959
2.26	12,502	665.26	5.01 ic	---	---	---	---	---	---	---	---	---	5.012
2.29	12,707	665.29	5.06 ic	---	---	---	---	---	---	---	---	---	5.065
2.33	12,912	665.33	5.12 ic	---	---	---	---	---	---	---	---	---	5.117
2.37	13,116	665.37	5.17 ic	---	---	---	---	---	---	---	---	---	5.168
2.41	13,321	665.41	5.22 ic	---	---	---	---	---	---	---	---	---	5.219
2.44	13,526	665.44	5.27 ic	---	---	---	---	---	---	---	---	---	5.269
2.48	13,731	665.48	5.32 ic	---	---	---	---	---	---	---	---	---	5.319
2.52	13,936	665.52	5.37 ic	---	---	---	---	---	---	---	---	---	5.369
2.55	14,141	665.55	5.42 ic	---	---	---	---	---	---	---	---	---	5.418
2.59	14,346	665.59	5.47 ic	---	---	---	---	---	---	---	---	---	5.466
2.63	14,551	665.63	5.51 ic	---	---	---	---	---	---	---	---	---	5.515
2.66	14,756	665.66	5.56 ic	---	---	---	---	---	---	---	---	---	5.562
2.70	14,961	665.70	5.61 ic	---	---	---	---	---	---	---	---	---	5.610
2.74	15,166	665.74	5.66 ic	---	---	---	---	---	---	---	---	---	5.657
2.78	15,371	665.78	5.70 ic	---	---	---	---	---	---	---	---	---	5.703
2.81	15,576	665.81	5.75 ic	---	---	---	---	---	---	---	---	---	5.749
2.85	15,781	665.85	5.80 ic	---	---	---	---	---	---	---	---	---	5.795
2.89	15,986	665.89	5.84 ic	---	---	---	---	---	---	---	---	---	5.841
2.92	16,191	665.92	5.89 ic	---	---	---	---	---	---	---	---	---	5.886
2.96	16,396	665.96	5.93 ic	---	---	---	---	---	---	---	---	---	5.931
3.00	16,601	666.00	5.98 ic	---	---	---	---	---	---	---	---	---	5.975
3.03	16,806	666.03	6.02 ic	---	---	---	---	---	---	---	---	---	6.019
3.07	17,010	666.07	6.06 ic	---	---	---	---	---	---	---	---	---	6.063
3.11	17,215	666.11	6.11 ic	---	---	---	---	---	---	---	---	---	6.106
3.15	17,420	666.15	6.15 ic	---	---	---	---	---	---	---	---	---	6.149
3.18	17,625	666.18	6.19 ic	---	---	---	---	---	---	---	---	---	6.192
3.22	17,830	666.22	6.23 ic	---	---	---	---	---	---	---	---	---	6.235
3.26	18,035	666.26	6.28 ic	---	---	---	---	---	---	---	---	---	6.277
3.29	18,240	666.29	6.32 ic	---	---	---	---	---	---	---	---	---	6.319
3.33	18,445	666.33	6.36 ic	---	---	---	---	---	---	---	---	---	6.361
3.37	18,650	666.37	6.40 ic	---	---	---	---	---	---	---	---	---	6.402
3.40	18,855	666.40	6.44 ic	---	---	---	---	---	---	---	---	---	6.444
3.44	19,060	666.44	6.48 ic	---	---	---	---	---	---	---	---	---	6.484
3.48	19,265	666.48	6.53 ic	---	---	---	---	---	---	---	---	---	6.525
3.52	19,470	666.52	6.57 ic	---	---	---	---	---	---	---	---	---	6.566
3.55	19,675	666.55	6.61 ic	---	---	---	---	---	---	---	---	---	6.606
3.59	19,880	666.59	6.65 ic	---	---	---	---	---	---	---	---	---	6.646
3.63	20,085	666.63	6.69 ic	---	---	---	---	---	---	---	---	---	6.685
3.66	20,290	666.66	6.72 ic	---	---	---	---	---	---	---	---	---	6.725
3.70	20,495	666.70	6.76 ic	---	---	---	---	---	---	---	---	---	6.764

...End

Watershed Model Schematic

BMP 3



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	3.550	PR100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	1.327	PR 100 Mitigated

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

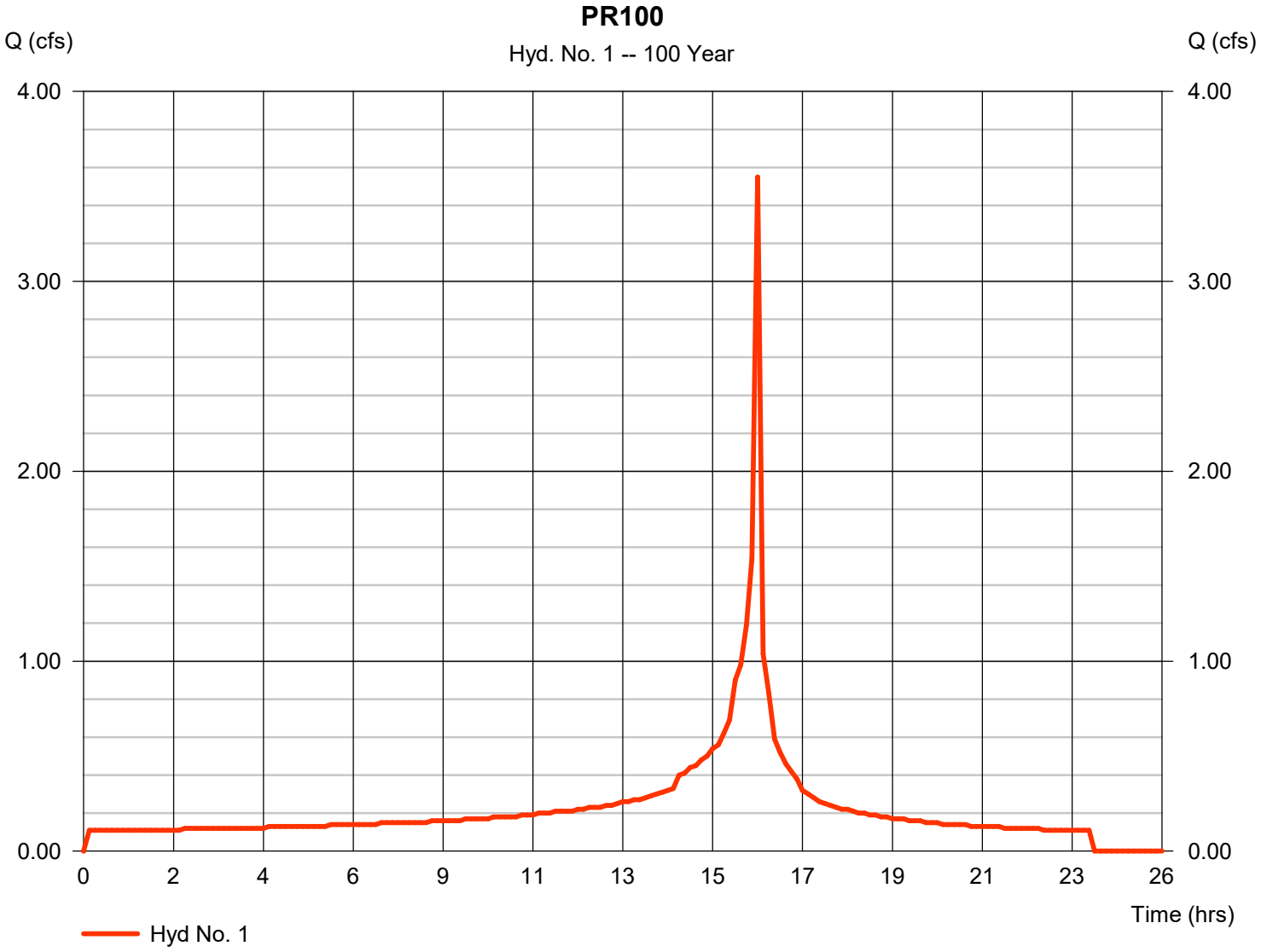
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	3.550	8	960	20,683	------	------	------	PR100
2	Reservoir	1.327	8	968	19,401	1	667.13	3,569	PR 100 Mitigated

Hydrograph Report

Hyd. No. 1

PR100

Hydrograph type	= Manual	Peak discharge	= 3.550 cfs
Storm frequency	= 100 yrs	Time to peak	= 16.00 hrs
Time interval	= 8 min	Hyd. volume	= 20,683 cuft



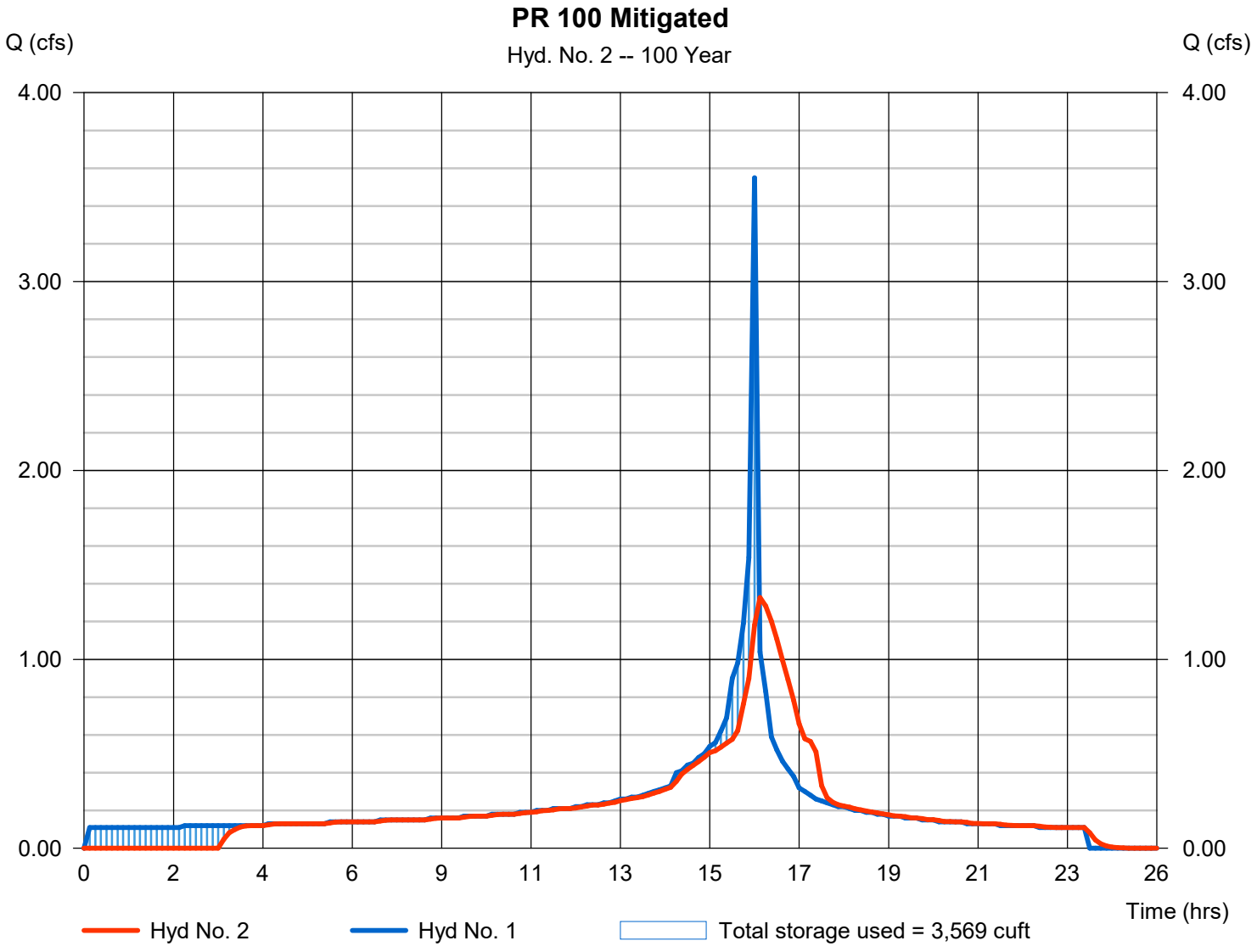
Hydrograph Report

Hyd. No. 2

PR 100 Mitigated

Hydrograph type	=	Reservoir	Peak discharge	=	1.327 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.13 hrs
Time interval	=	8 min	Hyd. volume	=	19,401 cuft
Inflow hyd. No.	=	1 - PR100	Max. Elevation	=	667.13 ft
Reservoir name	=	Biofiltration Basin	Max. Storage	=	3,569 cuft

Storage Indication method used.



Pond No. 1 - Biofiltration Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 666.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	666.00	2,115	0	0
0.25	666.25	2,565	584	584
0.50	666.50	3,020	697	1,281
0.75	666.75	3,480	812	2,093
1.00	667.00	3,943	927	3,020
1.25	667.25	4,411	1,044	4,064

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 8.00	0.00	0.00	0.00
Span (in)	= 8.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 666.00	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .012	.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)	= 8.00	0.00	0.00	0.00
Crest El. (ft)	= 666.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

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	666.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.03	58	666.03	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.05	117	666.05	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.08	175	666.08	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.10	234	666.10	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.13	292	666.13	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.15	350	666.15	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.17	409	666.18	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.20	467	666.20	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.22	526	666.23	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.25	584	666.25	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.28	654	666.28	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.30	723	666.30	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.32	793	666.33	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.35	863	666.35	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.38	933	666.38	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.40	1,002	666.40	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.43	1,072	666.43	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.45	1,142	666.45	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.48	1,212	666.48	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.50	1,281	666.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.52	1,362	666.53	0.11 oc	---	---	---	0.11	---	---	---	---	---	0.105
0.55	1,444	666.55	0.30 oc	---	---	---	0.30	---	---	---	---	---	0.298
0.57	1,525	666.58	0.51 oc	---	---	---	0.50 s	---	---	---	---	---	0.505
0.60	1,606	666.60	0.55 oc	---	---	---	0.55 s	---	---	---	---	---	0.551
0.62	1,687	666.63	0.57 oc	---	---	---	0.57 s	---	---	---	---	---	0.570
0.65	1,768	666.65	0.58 oc	---	---	---	0.58 s	---	---	---	---	---	0.579
0.67	1,850	666.68	0.58 oc	---	---	---	0.58 s	---	---	---	---	---	0.578
0.70	1,931	666.70	0.65 oc	---	---	---	0.64 s	---	---	---	---	---	0.645
0.72	2,012	666.73	0.71 oc	---	---	---	0.70 s	---	---	---	---	---	0.705
0.75	2,093	666.75	0.77 oc	---	---	---	0.77 s	---	---	---	---	---	0.765
0.77	2,186	666.78	0.82 oc	---	---	---	0.81 s	---	---	---	---	---	0.814
0.80	2,278	666.80	0.87 oc	---	---	---	0.86 s	---	---	---	---	---	0.865
0.82	2,371	666.83	0.91 oc	---	---	---	0.91 s	---	---	---	---	---	0.911
0.85	2,464	666.85	0.96 oc	---	---	---	0.95 s	---	---	---	---	---	0.945
0.87	2,557	666.88	1.00 oc	---	---	---	0.99 s	---	---	---	---	---	0.987
0.90	2,649	666.90	1.04 oc	---	---	---	1.02 s	---	---	---	---	---	1.023

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Biofiltration Basin

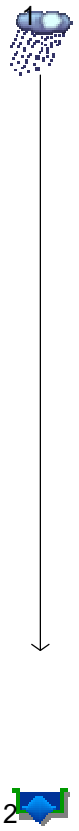
Stage / Storage / Discharge Table

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
0.92	2,742	666.93	1.08 oc	---	---	---	1.08 s	---	---	---	---	---	1.078
0.95	2,835	666.95	1.12 oc	---	---	---	1.10 s	---	---	---	---	---	1.101
0.97	2,928	666.98	1.15 oc	---	---	---	1.14 s	---	---	---	---	---	1.143
1.00	3,020	667.00	1.19 oc	---	---	---	1.17 s	---	---	---	---	---	1.167
1.02	3,125	667.03	1.22 oc	---	---	---	1.20 s	---	---	---	---	---	1.199
1.05	3,229	667.05	1.25 oc	---	---	---	1.23 s	---	---	---	---	---	1.227
1.08	3,333	667.08	1.29 oc	---	---	---	1.25 s	---	---	---	---	---	1.249
1.10	3,438	667.10	1.32 oc	---	---	---	1.31 s	---	---	---	---	---	1.310
1.13	3,542	667.13	1.35 oc	---	---	---	1.32 s	---	---	---	---	---	1.325
1.15	3,646	667.15	1.38 oc	---	---	---	1.33 s	---	---	---	---	---	1.333
1.17	3,751	667.18	1.41 oc	---	---	---	1.39 s	---	---	---	---	---	1.390
1.20	3,855	667.20	1.44 oc	---	---	---	1.39 s	---	---	---	---	---	1.388
1.23	3,959	667.23	1.46 oc	---	---	---	1.44 s	---	---	---	---	---	1.444
1.25	4,064	667.25	1.49 oc	---	---	---	1.47 s	---	---	---	---	---	1.469

...End

Watershed Model Schematic

BMP 4



Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	6.230	PR100
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	3.938	PR 100 Mitigated

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

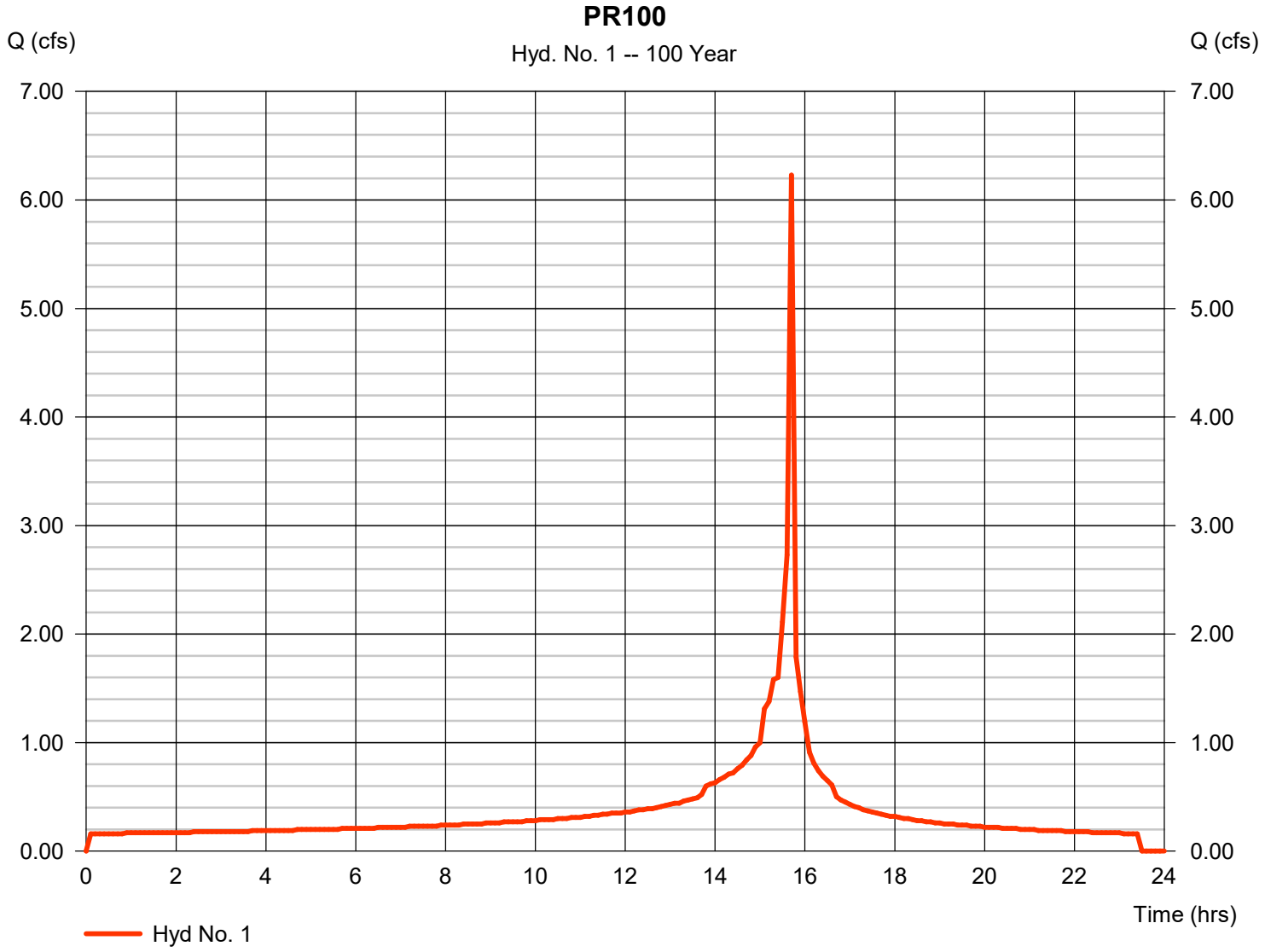
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	6.230	6	942	31,255	------	------	------	PR100
2	Reservoir	3.938	6	948	30,756	1	665.12	1,266	PR 100 Mitigated

Hydrograph Report

Hyd. No. 1

PR100

Hydrograph type	= Manual	Peak discharge	= 6.230 cfs
Storm frequency	= 100 yrs	Time to peak	= 15.70 hrs
Time interval	= 6 min	Hyd. volume	= 31,255 cuft



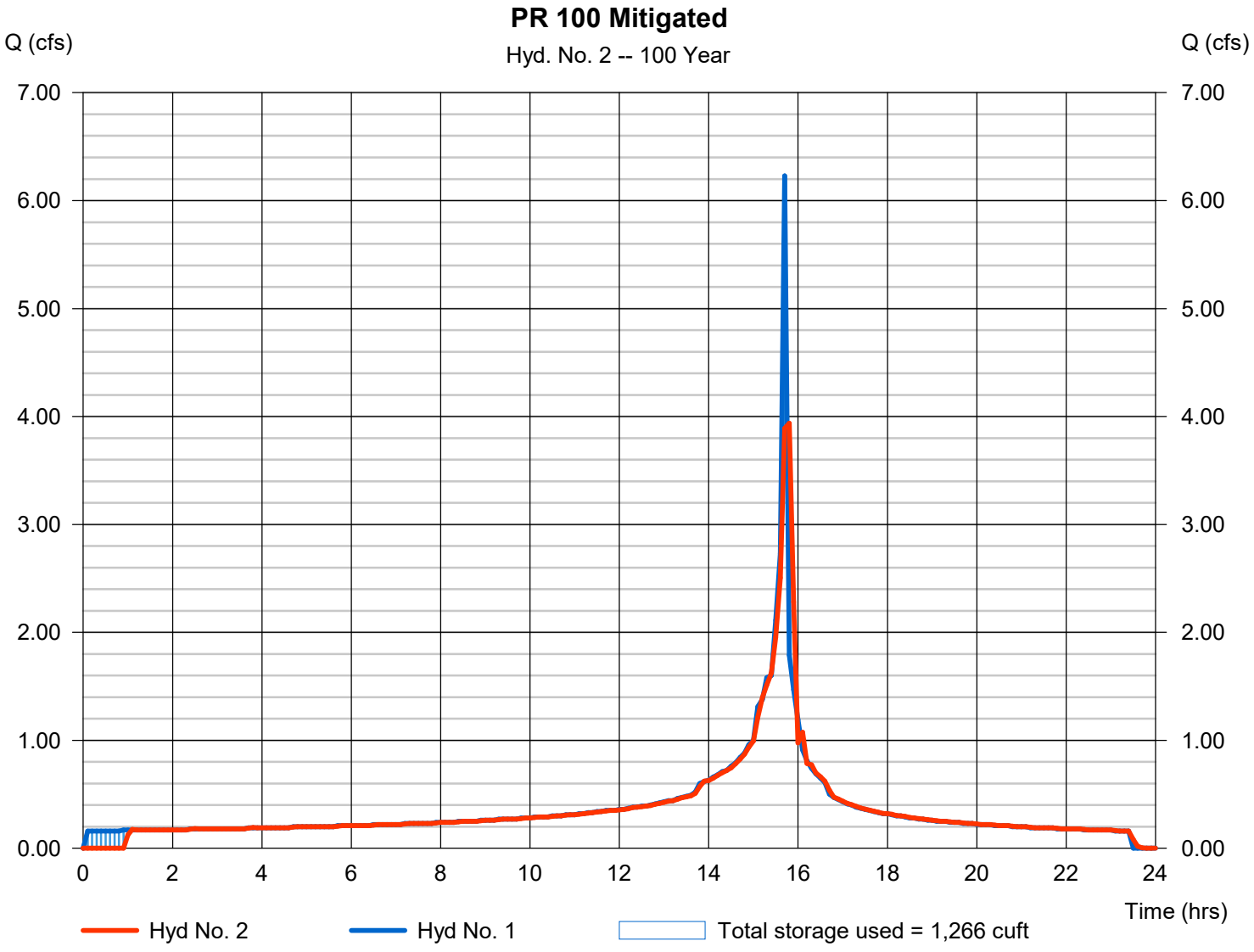
Hydrograph Report

Hyd. No. 2

PR 100 Mitigated

Hydrograph type	=	Reservoir	Peak discharge	=	3.938 cfs
Storm frequency	=	100 yrs	Time to peak	=	15.80 hrs
Time interval	=	6 min	Hyd. volume	=	30,756 cuft
Inflow hyd. No.	=	1 - PR100	Max. Elevation	=	665.12 ft
Reservoir name	=	Biofiltration Basin	Max. Storage	=	1,266 cuft

Storage Indication method used.



Pond No. 1 - Biofiltration Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 664.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	664.00	896	0	0
0.25	664.25	997	237	237
0.50	664.50	1,102	262	499
0.75	664.75	1,210	289	788
1.00	665.00	1,321	316	1,104
1.25	665.25	1,436	345	1,449

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 663.75	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 0.75	0.00	0.00	n/a
N-Value	= .012	.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)	= 8.00	0.00	0.00	0.00
Crest El. (ft)	= 664.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

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	664.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.03	24	664.03	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.05	47	664.05	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.08	71	664.08	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.10	95	664.10	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.13	118	664.13	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.15	142	664.15	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.17	166	664.18	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.20	189	664.20	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.22	213	664.23	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.25	237	664.25	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.28	263	664.28	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.30	289	664.30	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.32	315	664.33	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.35	342	664.35	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.38	368	664.38	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.40	394	664.40	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.43	420	664.43	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.45	447	664.45	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.48	473	664.48	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.50	499	664.50	0.34 ic	---	---	---	0.00	---	---	---	---	---	0.000
0.52	528	664.53	0.34 ic	---	---	---	0.11	---	---	---	---	---	0.105
0.55	557	664.55	0.34 ic	---	---	---	0.30	---	---	---	---	---	0.298
0.57	586	664.58	0.55 ic	---	---	---	0.55	---	---	---	---	---	0.548
0.60	615	664.60	0.84 ic	---	---	---	0.84	---	---	---	---	---	0.844
0.62	644	664.63	1.21 oc	---	---	---	1.18	---	---	---	---	---	1.179
0.65	672	664.65	1.57 oc	---	---	---	1.55	---	---	---	---	---	1.549
0.67	701	664.68	1.96 oc	---	---	---	1.95	---	---	---	---	---	1.953
0.70	730	664.70	2.26 oc	---	---	---	2.26 s	---	---	---	---	---	2.258
0.72	759	664.73	2.47 oc	---	---	---	2.45 s	---	---	---	---	---	2.452
0.75	788	664.75	2.64 oc	---	---	---	2.60 s	---	---	---	---	---	2.599
0.77	820	664.78	2.76 oc	---	---	---	2.76 s	---	---	---	---	---	2.757
0.80	851	664.80	2.88 oc	---	---	---	2.88 s	---	---	---	---	---	2.876
0.82	883	664.83	2.99 oc	---	---	---	2.99 s	---	---	---	---	---	2.990
0.85	915	664.85	3.10 oc	---	---	---	3.10 s	---	---	---	---	---	3.100
0.87	946	664.88	3.21 oc	---	---	---	3.20 s	---	---	---	---	---	3.205
0.90	978	664.90	3.31 oc	---	---	---	3.31 s	---	---	---	---	---	3.307

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Biofiltration Basin

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
0.92	1,009	664.93	3.40 oc	---	---	---	3.40 s	---	---	---	---	---	3.399
0.95	1,041	664.95	3.49 oc	---	---	---	3.49 s	---	---	---	---	---	3.491
0.97	1,073	664.98	3.57 oc	---	---	---	3.57 s	---	---	---	---	---	3.574
1.00	1,104	665.00	3.65 oc	---	---	---	3.65 s	---	---	---	---	---	3.651
1.02	1,139	665.03	3.72 oc	---	---	---	3.72 s	---	---	---	---	---	3.721
1.05	1,173	665.05	3.79 oc	---	---	---	3.79 s	---	---	---	---	---	3.786
1.08	1,208	665.08	3.85 oc	---	---	---	3.84 s	---	---	---	---	---	3.840
1.10	1,242	665.10	3.91 oc	---	---	---	3.91 s	---	---	---	---	---	3.911
1.13	1,277	665.13	3.96 oc	---	---	---	3.95 s	---	---	---	---	---	3.949
1.15	1,311	665.15	4.00 oc	---	---	---	4.00 s	---	---	---	---	---	4.000
1.17	1,346	665.18	4.05 oc	---	---	---	4.04 s	---	---	---	---	---	4.042
1.20	1,380	665.20	4.08 oc	---	---	---	4.07 s	---	---	---	---	---	4.074
1.23	1,415	665.23	4.10 oc	---	---	---	4.10 s	---	---	---	---	---	4.101
1.25	1,449	665.25	4.11 oc	---	---	---	4.10 s	---	---	---	---	---	4.101

...End