



Appendix I

Conceptual Hydrology Study

CONCEPTUAL HYDROLOGY STUDY

FOR

Kornerstone Muslim Cemetery

2205 E. Palmyra Avenue & 290 S. Yorba Street
Orange, CA

Prepared for Owner/Developer:

Kornerstone Park LLC
2500 E. Ball Road, Suite 260
Anaheim, CA 92806

Prepared By:

DRC ENGINEERING, INC.
160 S. Old Springs Road, Suite 210
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(714) 685-6860



Gregory R. Cooke RCE 39478 Exp. 12-31-21

2021-05-20

DRC Job No. 19-124

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Section I Introduction

This conceptual hydrology study has been prepared for Kornerstone Park LLC. The project site is located at 2205 E. Palmyra Avenue and 290 S. Yorba Street on the northwest corner of Palmyra Avenue and Tracy Lane. It is bounded by Santiago Creek on the west, Palmyra Avenue and a residential development on the south, Orange Unified School District Child Development Center on the east, and City of Orange's Yorba Park and Orange Dog Park on the north.

A total of approximately 4.3 acres will be disturbed as a result of the development. The proposed development includes the removal of the existing paved parking area and the construction of a new paved parking area, sidewalk, landscaped areas, and cemetery plots.

Reference

Appendix A: Vicinity Map

Section II Project Description

Existing Site Conditions:

The site was part of a former landfill known as the "La Veta Refuse Disposal Station" (Appendix B). The county operated the landfill from at least 1946 to 1956. As part of the closure of the landfill, a layer of soil, 3' to 15' thick, was placed over the landfill debris as a landfill cover.

By 1972, the existing YMCA building and parking area were constructed on the site. The YMCA facility was close in 2019 and the site is currently vacant.

Santiago Creek flows northeast to southwest through the northwest corner of the site. The area south of the existing building generally drains toward the existing parking lot and to Palmyra Avenue. The area north of the existing building, however, does not have definitive drainage directions with the existing Santiago Trail acting as a ridge:

- The area west of the trail drains directly into Santiago Creek.
- The area east of the trail drains in arbitrary directions and eventually, drain to the existing parking lot and to Palmyra Avenue.

There is no existing storm drain inlet in the vicinity of the site for Palmyra Avenue to drain into. According to Orange County Flood Control District, Base Map of Drainage Facilities (Appendix C), the closet inlet is located at the intersection of Tracy Lane and Debora Lane. There is an existing 24" RCP storm drain under the site, from Palmyra Avenue to Santiago Creek. The upstream of the 24" RCP is connected to an 18" storm drain from the adjacent OUSD Child Development Center (Appendix D).

The hydrology map for the existing condition in Appendix H shows the delineation of the drainage area boundaries in the existing site condition.

Reference

Appendix B: La Veta Landfill Site Survey Location Map

Appendix C: Orange County Flood Control District, Base Map of Drainage Facilities

Appendix D: City of Orange S.P. # 1362

Appendix H: Hydrology Map – Existing condition

Proposed Site Conditions:

Per Landfill Cover Investigation by Ardent (May 22, 2020):

A human health risk assessment completed in 2009 did not indicate a significant health risk to the YMCA workers or children as a result of exposure to the landfill cover soil, and indoor air samples collected within the on-site building showed no evidence of vapor intrusion. Based on the owner's initial discussions with the DTSC, site redevelopment as a cemetery may be acceptable, pending on further assessment of the landfill cover.

In the proposed development, the existing building will be renovated for use as a reception room; the rest of facilities will be demolished. New parking area, drive aisles, walkways, landscape and gravesites will be constructed. Retaining walls and screen walls are proposed along the perimeter. The grave plots will be concrete encased with 4 inches of gravel on top.

The proposed construction will take place in the area east of the existing Santiago Trail; no disturbance is proposed in the area west of the trail. The area to be under construction is in Zone X in FEMA FIRMette.

The site is divided into 3 drainage areas in the proposed condition:

- The area west of Santiago Trail will remain the same as the existing condition and will drain into Santiago Creek
- The area south of the retaining/screen walls along Palmyra Avenue will drain into Palmyra Avenue; it will be infeasible to collect and convey the stormwater from this area to the proposed detention system
- The stormwater from the proposed construction area will be collected by the proposed inlets. The inlets will drain into the proposed storm drain systems and to the proposed underground detention system. A proposed vortex separator unit will be the pre-treatment for the stormwater in the storm drains before the water enters the detention system.

The underground detention system will outlet to a pipe connected to a proposed diversion manhole. The diversion manhole has been designed for 2 functions:

- The low flow will be discharged to a proposed pump, where the flow will be treated by a Modular Wetland unit
- The high flows will be controlled so that the sum of discharge from the site in the proposed condition will not exceed the flow rate from the existing condition.

The low flow and the high flow will confluence on the south side of the Modular Wetland unit; the pipe with the combined flow will be connected to the existing 24" RCP. See Appendix H for the proposed hydrology map.

The following table lists the peak discharge rates from the existing and the proposed conditions:

Peak Discharge (cfs)				
Storm Frequency		10-Year	25-Year	100-Year
Existing Peak Discharge (cfs)	DA A	6.29	7.77	10.27
	DA B	4.47	5.41	7.07
	DA C	2.05	2.49	3.27
	Total	12.81	15.67	20.61
Proposed Peak Discharge (cfs)	DA A	12.70	15.29	19.82
	DA B	4.69	5.65	7.37
	DA C	0.54	0.65	0.84
	Total	17.93	21.59	28.03
Mitigated Discharge (cfs)	DA A	4.81	5.38	6.44
Proposed Peak Discharge (cfs)	DA B	4.69	5.65	7.37
	DA C	0.54	0.65	0.84
	Total	10.04	11.68	14.65

Reference

Appendix H: Hydrology Map – Proposed condition

Section III Methodology

According to the County's soil map, the soil on-site is type A.

AES HydroWIN v.2015 Rational Method is used to calculate the time of concentration for hydrology analysis and the peak flow rates to be conveyed in the proposed storm drain pipes.

AES HydroWIN v.2015 CH1 Small Area Unit Hydrograph is used to calculate the unit hydrographs for the peak flow rates and runoff volumes.

Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2016 is used for the hydrograph routing for the detention system analysis.

Reference

Appendix A: Soil Map

Appendix E: Hydrological Calculations Rational Method - Existing condition

Appendix F: Hydrological Calculations Rational Method - Proposed condition

Section IV Detention System Design

In a letter from Arden, March 25, 2021, (Appendix B):

..... The site has historically been used as a landfill, and as a result, elevated metals potentially exceeding

hazardous waste criteria have been detected in samples collected within the landfill waster. Based on this information, the installation of a stormwater infiltration system is not recommended at the site as it may enhance the potential for the migration of contaminants to groundwater.

Due to the concern for potential contamination, infiltration will not be utilized for the proposed storm drain system. The proposed underground detention system will be solid wall 72" corrugated metal pipes.

The unit hydrographs for DA C, the detention system data and the routing calculations are included in Appendix G.

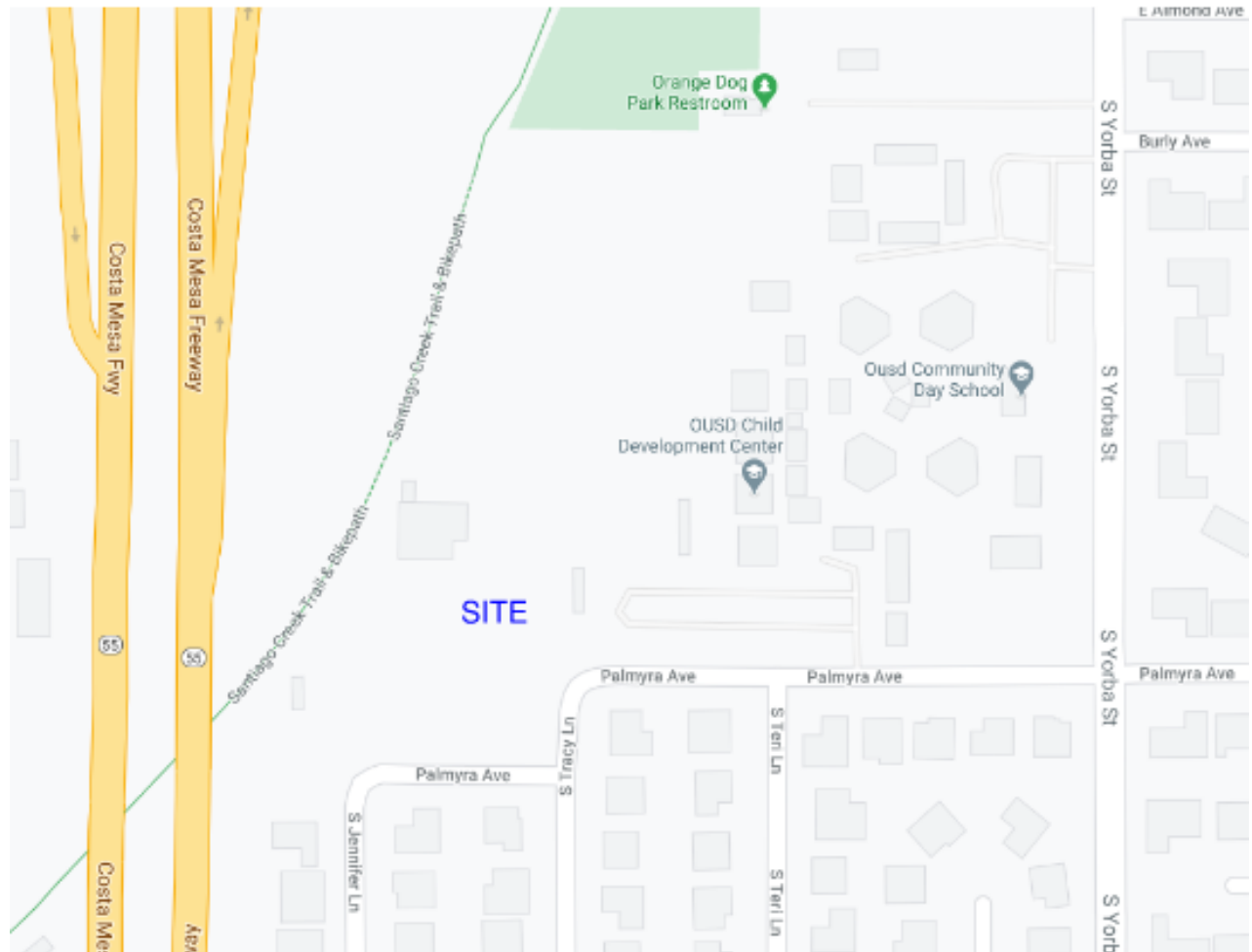
Reference

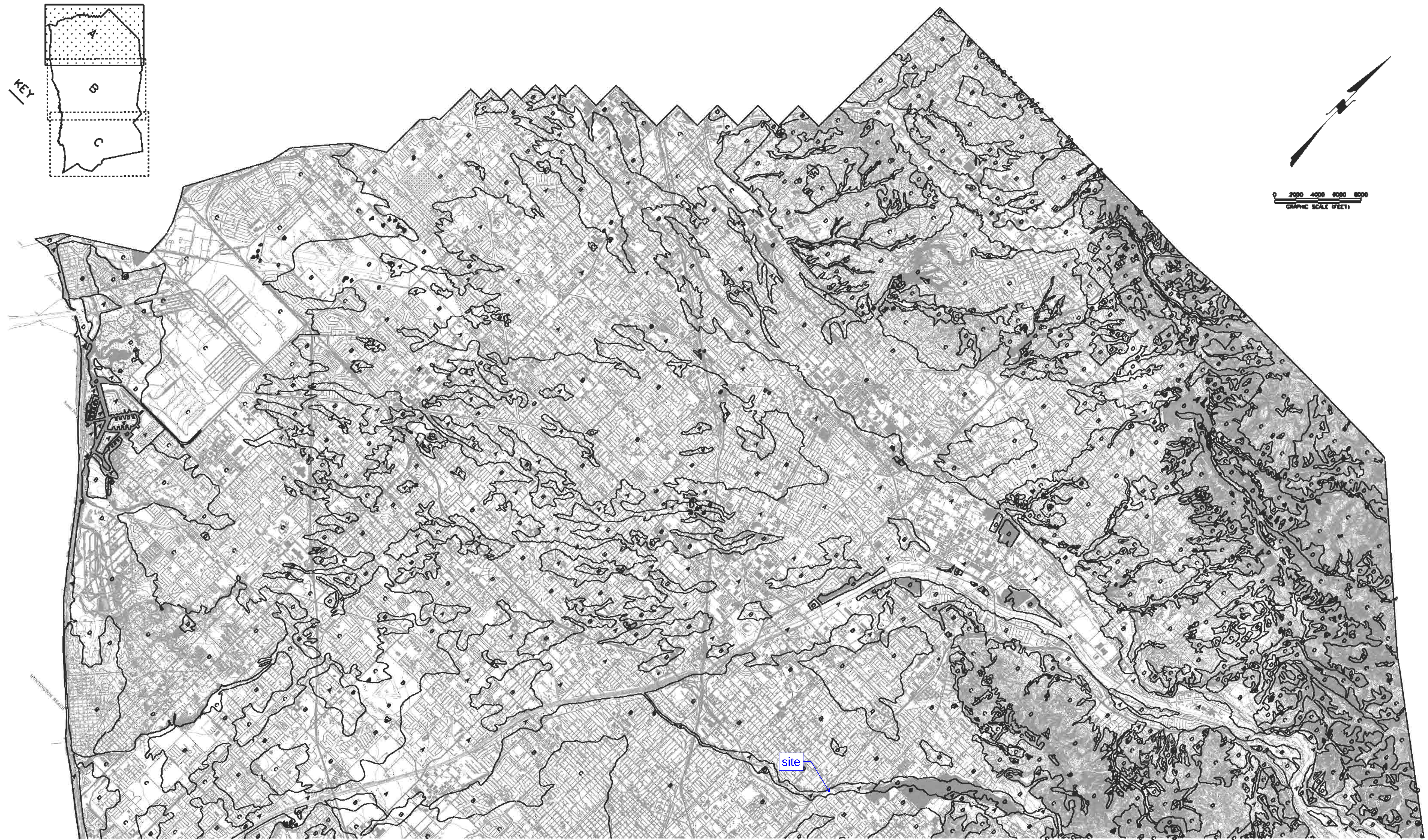
Appendix B: Infiltration letter from Arden

Appendix G: Detention System Analysis

APPENDIX A

Vicinity Map





ORANGE COUNTY
HYDROLOGY MANUAL

LEGEND
A B C D HYDROLOGIC SOIL GROUPS
HYDROLOGIC SOIL GROUP BOUNDARY

SOURCES:
BASE MAP - ORANGE COUNTY/RESOURCES & DEVELOPMENT MANAGEMENT DEPT
GEOMATICS AND LAND INFORMATION SYSTEMS DIVISION
SOIL GROUPS - SOIL SURVEY OF ORANGE COUNTY AND
WESTERN PART OF RIVERSIDE COUNTY, CALIFORNIA,
USDA, SOIL CONSERVATION SERVICE, 1978.

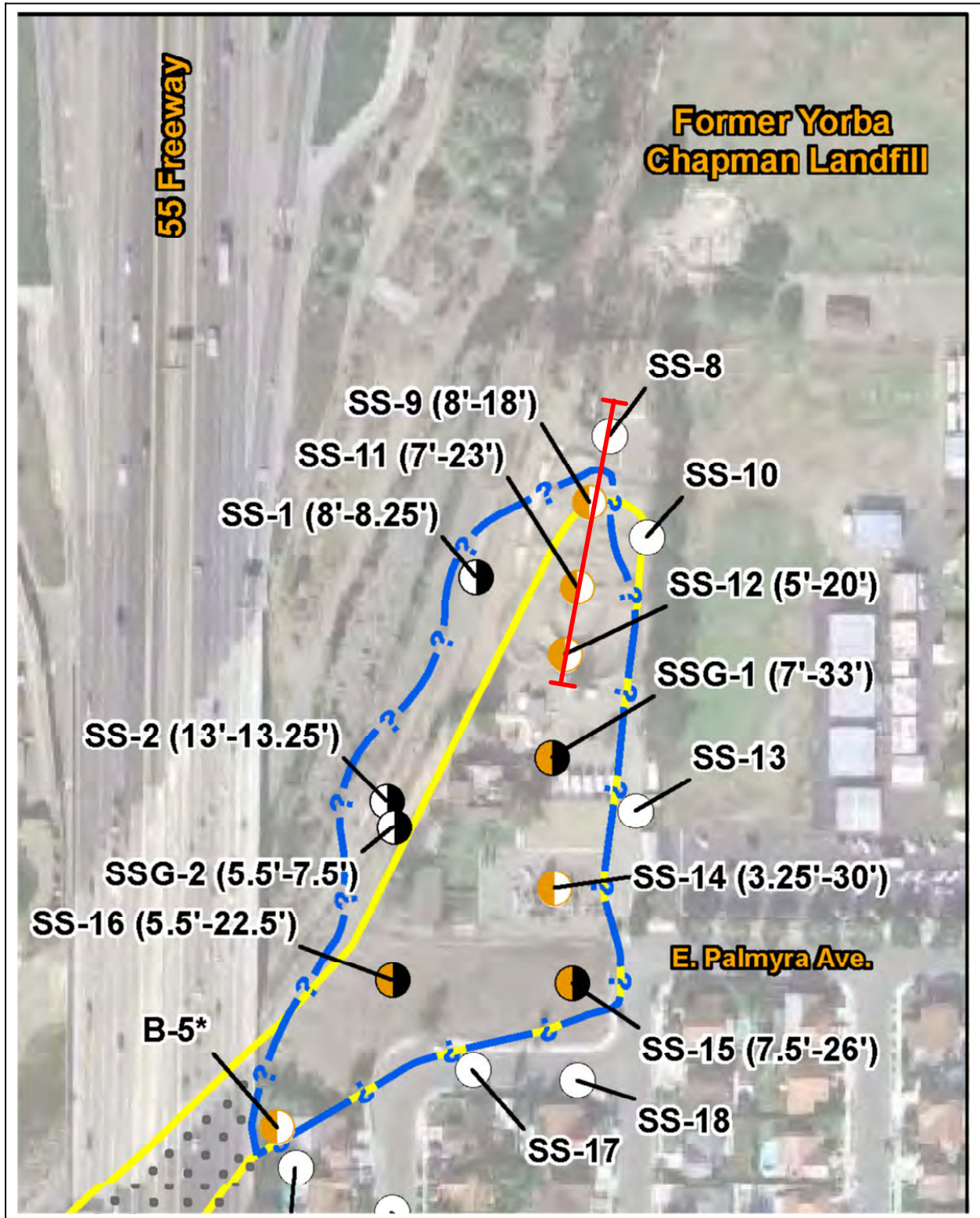
HYDROLOGIC CLASSIFICATION OF SOILS
ORANGE COUNTY, CALIFORNIA
PLATE A

APPENDIX B

La Veta Landfill Site Survey Location Map

Letter from Arden, March 25, 2021 (Re: Infiltration)

Survey Location Map
La Veta Landfill Site -- Orange, California



— Geophysical survey test
traverse T-1 (length 360 feet)

Figure 1



March 25, 2021
Project No. 10122805

Mr. Abdul Saquib
Kornerstone Park LLC
2500 East Ball Road, Suite 260
Anaheim, CA 92806

Subject: Stormwater Infiltration System
Proposed Korner Stone Park
2205 East Palmyra Avenue
Orange, California

Dear Mr. Saquib:

It is our understanding that the feasibility of a stormwater infiltration system is being evaluated as one of several approaches to stormwater management at 2205 East Palmyra Avenue, Orange California (site). The site has historically been used as a landfill, and as a result, elevated metals potentially exceeding hazardous waste criteria have been detected in samples collected within the landfill waste. Based on this information, the installation of a stormwater infiltration system is not recommended at the site as it may enhance the potential for the migration of contaminants to groundwater.

If there are any questions, please feel free to call the undersigned at your convenience.

Sincerely,
Ardent Environmental Group, Inc.

A handwritten signature in blue ink, appearing to read "D Kawasaki".

Dennis Kawasaki
Senior Project Scientist

A handwritten signature in blue ink, appearing to read "Paul Roberts".

Paul A. Roberts, P.G.
Principal Geologist

PAR/DK/aw

APPENDIX C

Orange County Flood Control District, Base Map of Drainage Facilities

APPENDIX D

City of Orange S.P. # 1362 (Storm Drain Plan for the existing 24" RCP)

APPENDIX E

Hydrologic Calculations, Existing Condition – Rational Method: 10-, 25-, 100-year

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
(c) Copyright 1983-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1510

Analysis prepared by:

DRC Engineering, Inc.
160 South Old Springs Road, Suite 210
Anaheim Hills, CA 92808
714-685-6860

***** DESCRIPTION OF STUDY *****
* 19-124 KORNERSTONE MUSLIM CEMETERY *
* EXISTING CONDITION *
* 10-YEAR FREQUENCY *

FILE NAME: 9124E010.DAT
TIME/DATE OF STUDY: 15:47 05/19/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

	HALF- WIDTH	CROWN TO CROSSFALL	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
NO.	(FT)	(FT)		(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

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 101.00 TO NODE 102.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 113.00
ELEVATION DATA: UPSTREAM(FEET) = 246.00 DOWNSTREAM(FEET) = 245.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 8.954

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.907

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	T_c (MIN.)
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NATURAL POOR COVER
"BARREN"          A          0.17      0.40      1.000      78      8.95
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 0.39
TOTAL AREA(ACRES) = 0.17    PEAK FLOW RATE(CFS) = 0.39

*****
FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 245.00 DOWNSTREAM(FEET) = 244.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 112.00 CHANNEL SLOPE = 0.0089
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.39
FLOW VELOCITY(FEET/SEC) = 1.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 10.27
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 103.00 = 225.00 FEET.

*****
FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 10.27
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.687
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL POOR COVER
"BARREN"          A          0.28      0.40      1.000      78
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 0.28    SUBAREA RUNOFF(CFS) = 0.57
EFFECTIVE AREA(ACRES) = 0.45    AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 0.4    PEAK FLOW RATE(CFS) = 0.92

*****
FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 244.00 DOWNSTREAM(FEET) = 243.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 242.00 CHANNEL SLOPE = 0.0041
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.92
FLOW VELOCITY(FEET/SEC) = 0.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 4.18 Tc(MIN.) = 14.45
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 104.00 = 467.00 FEET.

*****
FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 14.45
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.210
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS

```


LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
NATURAL POOR COVER					
"BARREN"	A	0.91	0.40	1.000	78
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					
SUBAREA AREA(ACRES) = 0.91 SUBAREA RUNOFF(CFS) = 1.49					
EFFECTIVE AREA(ACRES) = 1.36 AREA-AVERAGED Fm(INCH/HR) = 0.40					
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 1.00					
TOTAL AREA(ACRES) = 1.4 PEAK FLOW RATE(CFS) = 2.22					

FLOW PROCESS FROM NODE 104.00 TO NODE 105.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 243.00 DOWNSTREAM(FEET) = 236.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 286.00 CHANNEL SLOPE = 0.0245

CHANNEL FLOW THRU SUBAREA(CFS) = 2.22

FLOW VELOCITY(FEET/SEC) = 2.75 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

TRAVEL TIME(MIN.) = 1.73 Tc(MIN.) = 16.19

LONGEST FLOWPATH FROM NODE 101.00 TO NODE 105.00 = 753.00 FEET.

FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

=====

MAINLINE Tc(MIN.) = 16.19

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.071

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	2.52	0.40	0.500	32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500					
SUBAREA AREA(ACRES) = 2.52 SUBAREA RUNOFF(CFS) = 4.24					
EFFECTIVE AREA(ACRES) = 3.88 AREA-AVERAGED Fm(INCH/HR) = 0.27					
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.68					
TOTAL AREA(ACRES) = 3.9 PEAK FLOW RATE(CFS) = 6.29					

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00

ELEVATION DATA: UPSTREAM(FEET) = 235.00 DOWNSTREAM(FEET) = 227.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.188

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.975

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL POOR COVER						
"OPEN BRUSH"	A	1.39	0.40	1.000	62	5.19
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000						
SUBAREA RUNOFF(CFS) = 4.47						
TOTAL AREA(ACRES) = 1.39 PEAK FLOW RATE(CFS) = 4.47						


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*****
FLOW PROCESS FROM NODE      301.00 TO NODE      302.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH (FEET) =   121.00
ELEVATION DATA: UPSTREAM (FEET) =   244.00  DOWNSTREAM (FEET) =   237.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) =    6.358
* 10 YEAR RAINFALL INTENSITY (INCH/HR) =   3.537
SUBAREA Tc AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS   Tc
    LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL POOR COVER
"OPEN BRUSH"           A         0.73     0.40     1.000    62    6.36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) =   0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =   1.000
SUBAREA RUNOFF (CFS) =         2.05
TOTAL AREA (ACRES) =         0.73  PEAK FLOW RATE (CFS) =         2.05
=====
END OF RATIONAL METHOD ANALYSIS

```

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
(c) Copyright 1983-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1510

Analysis prepared by:

DRC Engineering, Inc.
160 South Old Springs Road, Suite 210
Anaheim Hills, CA 92808
714-685-6860

***** DESCRIPTION OF STUDY *****
* 19-124 KORNERSTONE MUSLIM CEMETERY *
* EXISTING CONDITION *
* 25-YEAR FREQUENCY *

FILE NAME: 9124E025.DAT
TIME/DATE OF STUDY: 15:49 05/19/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

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

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 113.00
ELEVATION DATA: UPSTREAM(FEET) = 246.00 DOWNSTREAM(FEET) = 245.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 8.954
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.469
SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	T_c (MIN.)
-------------------------------	-------------------	-----------------	-----------------	-----------------	-----------	-----------------

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NATURAL POOR COVER
"BARREN"          A          0.17      0.40      1.000      78      8.95
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 0.48
TOTAL AREA(ACRES) = 0.17 PEAK FLOW RATE(CFS) = 0.48

*****
FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 245.00 DOWNSTREAM(FEET) = 244.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 112.00 CHANNEL SLOPE = 0.0089
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.48
FLOW VELOCITY(FEET/SEC) = 1.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 10.27
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 103.00 = 225.00 FEET.

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 10.27
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.209
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL POOR COVER
"BARREN" A 0.28 0.40 1.000 78
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 0.28 SUBAREA RUNOFF(CFS) = 0.70
EFFECTIVE AREA(ACRES) = 0.45 AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 0.4 PEAK FLOW RATE(CFS) = 1.14

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 104.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 244.00 DOWNSTREAM(FEET) = 243.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 242.00 CHANNEL SLOPE = 0.0041
CHANNEL FLOW THRU SUBAREA(CFS) = 1.14
FLOW VELOCITY(FEET/SEC) = 0.99 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 4.08 Tc(MIN.) = 14.35
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 104.00 = 467.00 FEET.

*****
FLOW PROCESS FROM NODE 104.00 TO NODE 104.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 14.35
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.656
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

```



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NATURAL POOR COVER
"BARREN"                A          0.91      0.40      1.000      78
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 0.91      SUBAREA RUNOFF(CFS) = 1.85
EFFECTIVE AREA(ACRES) = 1.36      AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.40      AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1.4      PEAK FLOW RATE(CFS) = 2.76

*****
FLOW PROCESS FROM NODE      104.00 TO NODE      105.00 IS CODE = 52
-----
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 243.00 DOWNSTREAM(FEET) = 236.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 286.00 CHANNEL SLOPE = 0.0245
CHANNEL FLOW THRU SUBAREA(CFS) = 2.76
FLOW VELOCITY(FEET/SEC) = 2.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.65 Tc(MIN.) = 16.01
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 105.00 = 753.00 FEET.

*****
FLOW PROCESS FROM NODE      105.00 TO NODE      105.00 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
MAINLINE Tc(MIN.) = 16.01
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.497
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"      A          2.52      0.40      0.500      32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
SUBAREA AREA(ACRES) = 2.52      SUBAREA RUNOFF(CFS) = 5.20
EFFECTIVE AREA(ACRES) = 3.88      AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.40      AREA-AVERAGED Ap = 0.68
TOTAL AREA(ACRES) = 3.9      PEAK FLOW RATE(CFS) = 7.77

*****
FLOW PROCESS FROM NODE      201.00 TO NODE      202.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00
ELEVATION DATA: UPSTREAM(FEET) = 235.00 DOWNSTREAM(FEET) = 227.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.188
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.724
SUBAREA Tc AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS      Tc
    LAND USE          GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN    (MIN.)
NATURAL POOR COVER
"OPEN BRUSH"              A          1.39      0.40      1.000      62      5.19
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 5.41
TOTAL AREA(ACRES) = 1.39      PEAK FLOW RATE(CFS) = 5.41

```

```

*****
FLOW PROCESS FROM NODE      301.00 TO NODE      302.00 IS CODE =  21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =    121.00
ELEVATION DATA: UPSTREAM(FEET) =    244.00  DOWNSTREAM(FEET) =    237.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.358
* 25 YEAR RAINFALL INTENSITY(INCH/HR) =    4.210
SUBAREA Tc AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS      Tc
    LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
NATURAL POOR COVER
"OPEN BRUSH"           A         0.73      0.40      1.000      62    6.36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    1.000
SUBAREA RUNOFF(CFS) =          2.49
TOTAL AREA(ACRES) =          0.73  PEAK FLOW RATE(CFS) =          2.49
=====
END OF RATIONAL METHOD ANALYSIS

```

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Analysis prepared by:

DRC Engineering, Inc.
160 South Old Springs Road, Suite 210
Anaheim Hills, CA 92808
714-685-6860

***** DESCRIPTION OF STUDY *****
* 19-124 KORNERSTONE MUSLIM CEMETERY *
* EXISTING CONDITION *
* 100-YEAR FREQUENCY *

FILE NAME: 9124E100.DAT
TIME/DATE OF STUDY: 15:50 05/19/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 113.00
ELEVATION DATA: UPSTREAM(FEET) = 246.00 DOWNSTREAM(FEET) = 245.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 8.954

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.431

SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	T_c (MIN.)
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NATURAL POOR COVER
"BARREN"          A          0.17      0.40      1.000      93      8.95
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 0.63
TOTAL AREA(ACRES) = 0.17    PEAK FLOW RATE(CFS) = 0.63

*****
FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 245.00 DOWNSTREAM(FEET) = 244.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 112.00 CHANNEL SLOPE = 0.0089
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.63
FLOW VELOCITY(FEET/SEC) = 1.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 10.27
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 103.00 = 225.00 FEET.

*****
FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 10.27
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.096
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp          Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL POOR COVER
"BARREN"              A          0.28      0.40      1.000      93
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 0.28    SUBAREA RUNOFF(CFS) = 0.91
EFFECTIVE AREA(ACRES) = 0.45    AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 0.4    PEAK FLOW RATE(CFS) = 1.49

*****
FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 244.00 DOWNSTREAM(FEET) = 243.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 242.00 CHANNEL SLOPE = 0.0041
CHANNEL FLOW THRU SUBAREA(CFS) = 1.49
FLOW VELOCITY(FEET/SEC) = 1.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.87 Tc(MIN.) = 14.14
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 104.00 = 467.00 FEET.

*****
FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 14.14
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.410
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp          Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN

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NATURAL POOR COVER
"BARREN"                A          0.91      0.40      1.000      93
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 0.91      SUBAREA RUNOFF(CFS) = 2.47
EFFECTIVE AREA(ACRES) = 1.36      AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.40  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1.4      PEAK FLOW RATE(CFS) = 3.69

*****
FLOW PROCESS FROM NODE 104.00 TO NODE 105.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 243.00  DOWNSTREAM(FEET) = 236.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 286.00  CHANNEL SLOPE = 0.0245
CHANNEL FLOW THRU SUBAREA(CFS) = 3.69
FLOW VELOCITY(FEET/SEC) = 3.08 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.55  Tc(MIN.) = 15.69
LONGEST FLOWPATH FROM NODE 101.00 TO NODE 105.00 = 753.00 FEET.

*****
FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 15.69
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.213
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
    LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"    A        2.52      0.40      0.500      52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
SUBAREA AREA(ACRES) = 2.52      SUBAREA RUNOFF(CFS) = 6.83
EFFECTIVE AREA(ACRES) = 3.88      AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.40  AREA-AVERAGED Ap = 0.68
TOTAL AREA(ACRES) = 3.9      PEAK FLOW RATE(CFS) = 10.27

*****
FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00
ELEVATION DATA: UPSTREAM(FEET) = 235.00  DOWNSTREAM(FEET) = 227.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.188
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.058
SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS  Tc
    LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
NATURAL POOR COVER
"OPEN BRUSH"            A        1.39      0.40      1.000      81  5.19
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 7.07
TOTAL AREA(ACRES) = 1.39      PEAK FLOW RATE(CFS) = 7.07

```

```

*****
FLOW PROCESS FROM NODE      301.00 TO NODE      302.00 IS CODE =  21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =   121.00
ELEVATION DATA: UPSTREAM(FEET) =    244.00  DOWNSTREAM(FEET) =    237.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.358
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =    5.391
SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS   Tc
    LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL POOR COVER
"OPEN BRUSH"           A         0.73      0.40      1.000    81    6.36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    1.000
SUBAREA RUNOFF(CFS) =          3.27
TOTAL AREA(ACRES) =          0.73  PEAK FLOW RATE(CFS) =          3.27
=====
END OF RATIONAL METHOD ANALYSIS

```


APPENDIX F

Hydrologic Calculations, Proposed Condition – Rational Method: 10-, 25-, 100-year

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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Analysis prepared by:

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Anaheim Hills, CA 92808
714-685-6860

***** DESCRIPTION OF STUDY *****
* 19-124 KORNERSTONE MUSLIM CEMETERY *
* PROPOSED CONDITION *
* 10-YEAR FREQUENCY *

FILE NAME: 9124P010.DAT
TIME/DATE OF STUDY: 09:03 05/18/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
=====	=====	=====	=====	=====	=====	=====	=====	=====
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

FLOW PROCESS FROM NODE 1800.00 TO NODE 1800.00 IS CODE = 22

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<

=====

USER SPECIFIED Tc(MIN.) = 5.000
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.060
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.28	0.40	0.100	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 1.01


```

TOTAL AREA(ACRES) =      0.28    PEAK FLOW RATE(CFS) =      1.01

*****
FLOW PROCESS FROM NODE    1800.00 TO NODE    1700.00 IS CODE =   31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    239.60  DOWNSTREAM(FEET) =    238.26
FLOW LENGTH(FEET) =    268.00  MANNING'S N =    0.013
DEPTH OF FLOW IN    9.0 INCH PIPE IS    6.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    2.93
ESTIMATED PIPE DIAMETER(INCH) =    9.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =      1.01
PIPE TRAVEL TIME(MIN.) =    1.53    Tc(MIN.) =    6.53
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1700.00 =    268.00 FEET.

*****
FLOW PROCESS FROM NODE    1700.00 TO NODE    1700.00 IS CODE =   81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) =    6.53
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =    3.485
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL              A        0.06     0.40     0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    0.100
SUBAREA AREA(ACRES) =    0.06    SUBAREA RUNOFF(CFS) =    0.19
EFFECTIVE AREA(ACRES) =    0.34    AREA-AVERAGED Fm(INCH/HR) =    0.04
AREA-AVERAGED Fp(INCH/HR) =    0.40  AREA-AVERAGED Ap =    0.10
TOTAL AREA(ACRES) =    0.3    PEAK FLOW RATE(CFS) =    1.05

*****
FLOW PROCESS FROM NODE    1700.00 TO NODE    1600.00 IS CODE =   31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    238.26  DOWNSTREAM(FEET) =    237.36
FLOW LENGTH(FEET) =    179.00  MANNING'S N =    0.013
DEPTH OF FLOW IN    9.0 INCH PIPE IS    6.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    2.95
ESTIMATED PIPE DIAMETER(INCH) =    9.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =    1.05
PIPE TRAVEL TIME(MIN.) =    1.01    Tc(MIN.) =    7.54
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1600.00 =    447.00 FEET.

*****
FLOW PROCESS FROM NODE    1600.00 TO NODE    1600.00 IS CODE =   81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) =    7.54
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =    3.208
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL              A        0.06     0.40     0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    0.100

```

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SUBAREA AREA(ACRES) =      0.06      SUBAREA RUNOFF(CFS) =      0.17
EFFECTIVE AREA(ACRES) =      0.40      AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40      AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) =      0.4      PEAK FLOW RATE(CFS) =      1.14

*****
FLOW PROCESS FROM NODE 1600.00 TO NODE 1500.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 237.36 DOWNSTREAM(FEET) = 237.16
FLOW LENGTH(FEET) = 40.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 5.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.06
ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.14
PIPE TRAVEL TIME(MIN.) = 0.22 Tc(MIN.) = 7.76
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1500.00 = 487.00 FEET.

*****
FLOW PROCESS FROM NODE 1500.00 TO NODE 1500.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.76
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.156
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A      0.18      0.40      0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.18      SUBAREA RUNOFF(CFS) = 0.50
EFFECTIVE AREA(ACRES) = 0.58      AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 0.6      PEAK FLOW RATE(CFS) = 1.63

*****
FLOW PROCESS FROM NODE 1500.00 TO NODE 1400.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 237.16 DOWNSTREAM(FEET) = 237.08
FLOW LENGTH(FEET) = 15.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.42
ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.63
PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 7.83
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1400.00 = 502.00 FEET.

*****
FLOW PROCESS FROM NODE 1400.00 TO NODE 1400.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.83
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.139
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP (ACRES) (INCH/HR) (DECIMAL) CN

```



```

COMMERCIAL          A          1.12          0.40          0.100          32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 1.12          SUBAREA RUNOFF(CFS) = 3.12
EFFECTIVE AREA(ACRES) = 1.70          AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40          AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.7          PEAK FLOW RATE(CFS) = 4.74

*****
FLOW PROCESS FROM NODE 1400.00 TO NODE 1300.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 237.08 DOWNSTREAM(FEET) = 236.98
FLOW LENGTH(FEET) = 20.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.37
ESTIMATED PIPE DIAMETER(INCH) = 18.00          NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.74
PIPE TRAVEL TIME(MIN.) = 0.08          Tc(MIN.) = 7.91
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.00 = 522.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.00 TO NODE 1300.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.91
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.122
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/          SCS SOIL          AREA          Fp          Ap          SCS
LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL          A          0.22          0.40          0.100          32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.22          SUBAREA RUNOFF(CFS) = 0.61
EFFECTIVE AREA(ACRES) = 1.92          AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40          AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.9          PEAK FLOW RATE(CFS) = 5.33

*****
FLOW PROCESS FROM NODE 1300.00 TO NODE 1300.10 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 236.98 DOWNSTREAM(FEET) = 235.89
FLOW LENGTH(FEET) = 139.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 15.0 INCH PIPE IS 11.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.17
ESTIMATED PIPE DIAMETER(INCH) = 15.00          NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.33
PIPE TRAVEL TIME(MIN.) = 0.45          Tc(MIN.) = 8.35
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.10 = 661.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.10 TO NODE 1300.10 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****

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FLOW PROCESS FROM NODE    1222.00 TO NODE    1222.00 IS CODE =  22
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =   139.00
USER SPECIFIED Tc(MIN.) =       5.000
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =   4.060
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS
    LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A         0.74      0.40      0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =   0.100
SUBAREA RUNOFF(CFS) =         2.68
TOTAL AREA(ACRES) =         0.74   PEAK FLOW RATE(CFS) =         2.68

*****
FLOW PROCESS FROM NODE    1222.00 TO NODE    1221.00 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   237.80  DOWNSTREAM(FEET) =   236.87
FLOW LENGTH(FEET) =   185.00  MANNING'S N =   0.013
DEPTH OF FLOW IN 15.0 INCH PIPE IS   8.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   3.80
ESTIMATED PIPE DIAMETER(INCH) =   15.00   NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =         2.68
PIPE TRAVEL TIME(MIN.) =   0.81   Tc(MIN.) =   5.81
LONGEST FLOWPATH FROM NODE    1222.00 TO NODE    1221.00 =   324.00 FEET.

*****
FLOW PROCESS FROM NODE    1221.00 TO NODE    1221.00 IS CODE =  10
-----
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
=====

*****
FLOW PROCESS FROM NODE    1210.00 TO NODE    1210.00 IS CODE =  22
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
USER SPECIFIED Tc(MIN.) =       5.000
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =   4.060
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS
    LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A         0.90      0.40      0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =   0.100
SUBAREA RUNOFF(CFS) =         3.26
TOTAL AREA(ACRES) =         0.90   PEAK FLOW RATE(CFS) =         3.26

*****
FLOW PROCESS FROM NODE    1210.00 TO NODE    1221.00 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   242.40  DOWNSTREAM(FEET) =   236.87

```

FLOW LENGTH(FEET) = 158.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.28
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.26
 PIPE TRAVEL TIME(MIN.) = 0.32 Tc(MIN.) = 5.32
 LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.26	5.32	3.919	0.40 (0.04)	0.10	0.9	1210.00

LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.68	5.81	3.724	0.40 (0.04)	0.10	0.7	1222.00

LONGEST FLOWPATH FROM NODE 1222.00 TO NODE 1221.00 = 324.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.83	5.32	3.919	0.40 (0.04)	0.10	1.6	1210.00
2	5.77	5.81	3.724	0.40 (0.04)	0.10	1.6	1222.00

TOTAL AREA(ACRES) = 1.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5.83 Tc(MIN.) = 5.318
 EFFECTIVE AREA(ACRES) = 1.58 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 1.6
 LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN.) = 5.32
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.919
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.35	0.40	0.100	32

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 1.22
 EFFECTIVE AREA(ACRES) = 1.93 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 6.73


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*****
FLOW PROCESS FROM NODE    1221.00 TO NODE    1300.10 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   236.87  DOWNSTREAM(FEET) =   235.89
FLOW LENGTH(FEET) =   196.00  MANNING'S N =   0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   4.65
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =   6.73
PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =   6.02
LONGEST FLOWPATH FROM NODE    1210.00 TO NODE    1300.10 =   539.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.10 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         6.73   6.02   3.650  0.40( 0.04)  0.10         1.9   1210.00
    2         6.60   6.51   3.488  0.40( 0.04)  0.10         2.0   1222.00
LONGEST FLOWPATH FROM NODE    1210.00 TO NODE    1300.10 =   539.00 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         5.33   8.35   3.025  0.40( 0.04)  0.10         1.9   1800.00
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.10 =   661.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
    1        11.37   6.02   3.650  0.40( 0.04)  0.10         3.3   1210.00
    2        11.40   6.51   3.488  0.40( 0.04)  0.10         3.5   1222.00
    3        11.04   8.35   3.025  0.40( 0.04)  0.10         3.9   1800.00
TOTAL AREA(ACRES) =   3.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   11.40  Tc(MIN.) =   6.515
EFFECTIVE AREA(ACRES) =   3.49  AREA-AVERAGED Fm(INCH/HR) =   0.04
AREA-AVERAGED Fp(INCH/HR) =   0.40  AREA-AVERAGED Ap =   0.10
TOTAL AREA(ACRES) =   3.9
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.10 =   661.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.10 IS CODE =  12
-----
>>>>>CLEAR MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.20 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   235.89  DOWNSTREAM(FEET) =   235.65

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FLOW LENGTH(FEET) = 48.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 15.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.42
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 11.40
PIPE TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 6.66
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.20 = 709.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.20 TO NODE 1300.20 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE 1120.00 TO NODE 1120.00 IS CODE = 22
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 48.00
USER SPECIFIED Tc(MIN.) = 5.000
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.060
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.18 0.40 0.100 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 0.65
TOTAL AREA(ACRES) = 0.18 PEAK FLOW RATE(CFS) = 0.65

*****
FLOW PROCESS FROM NODE 1120.00 TO NODE 1120.10 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 243.90 DOWNSTREAM(FEET) = 241.54
FLOW LENGTH(FEET) = 471.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 2.67
ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.65
PIPE TRAVEL TIME(MIN.) = 2.94 Tc(MIN.) = 7.94
LONGEST FLOWPATH FROM NODE 1120.00 TO NODE 1120.10 = 519.00 FEET.

*****
FLOW PROCESS FROM NODE 1120.10 TO NODE 1120.10 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.94
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.113
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.33 0.40 0.100 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.33 SUBAREA RUNOFF(CFS) = 0.91
EFFECTIVE AREA(ACRES) = 0.51 AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10

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TOTAL AREA (ACRES) =          0.5          PEAK FLOW RATE (CFS) =          1.41

*****
FLOW PROCESS FROM NODE    1120.10 TO NODE    1300.20 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) =    241.54  DOWNSTREAM (FEET) =    235.65
FLOW LENGTH (FEET) =    31.00  MANNING'S N =    0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO  8.000
DEPTH OF FLOW IN    8.0 INCH PIPE IS    2.9 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) =    12.57
ESTIMATED PIPE DIAMETER (INCH) =    8.00    NUMBER OF PIPES =    1
PIPE-FLOW (CFS) =          1.41
PIPE TRAVEL TIME (MIN.) =    0.04    Tc (MIN.) =    7.99
LONGEST FLOWPATH FROM NODE    1120.00 TO NODE    1300.20 =    550.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.20 TO NODE    1300.20 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         1.41   7.99   3.104  0.40 ( 0.04)  0.10         0.5   1120.00
LONGEST FLOWPATH FROM NODE    1120.00 TO NODE    1300.20 =    550.00 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        11.37   6.17   3.599  0.40 ( 0.04)  0.10         3.3   1210.00
    2        11.40   6.66   3.444  0.40 ( 0.04)  0.10         3.5   1222.00
    3        11.04   8.50   2.995  0.40 ( 0.04)  0.10         3.9   1800.00
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.20 =    709.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp (Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
    1        12.63   6.17   3.599  0.40 ( 0.04)  0.10         3.7   1210.00
    2        12.70   6.66   3.444  0.40 ( 0.04)  0.10         3.9   1222.00
    3        12.55   7.99   3.104  0.40 ( 0.04)  0.10         4.3   1120.00
    4        12.40   8.50   2.995  0.40 ( 0.04)  0.10         4.4   1800.00
TOTAL AREA (ACRES) =          4.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) =          12.70    Tc (MIN.) =          6.662
EFFECTIVE AREA (ACRES) =          3.91    AREA-AVERAGED Fm (INCH/HR) =    0.04
AREA-AVERAGED Fp (INCH/HR) =    0.40    AREA-AVERAGED Ap =    0.10
TOTAL AREA (ACRES) =          4.4
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.20 =    709.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.20 TO NODE    1300.20 IS CODE =  12
-----
>>>>>CLEAR MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE    2000.00 TO NODE    2000.10 IS CODE =  21
-----

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00
ELEVATION DATA: UPSTREAM(FEET) = 235.00 DOWNSTREAM(FEET) = 227.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION\ CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.060

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
PUBLIC PARK	A	1.40	0.40	0.850	32	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.850

SUBAREA RUNOFF (CFS) = 4.69

TOTAL AREA (ACRES) = 1.40 PEAK FLOW RATE (CFS) = 4.69

FLOW PROCESS FROM NODE 3000.00 TO NODE 3000.00 IS CODE = 22

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>>>USE SPECIFIED T_c VALUE FOR INITIAL SUBAREA<<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00

USER SPECIFIED T_c (MIN.) = 5.000

* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.060

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
PUBLIC PARK	A	0.16	0.40	0.850	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.850

SUBAREA RUNOFF (CFS) = 0.54

TOTAL AREA (ACRES) = 0.16 PEAK FLOW RATE (CFS) = 0.54

=====

END OF RATIONAL METHOD ANALYSIS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* 19-124 KORNERSTONE MUSLIM CEMETERY *
* PROPOSED CONDITION *
* 25-YEAR FREQUENCY *

FILE NAME: 9124P025.DAT
TIME/DATE OF STUDY: 09:04 05/18/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

FLOW PROCESS FROM NODE 1800.00 TO NODE 1800.00 IS CODE = 22

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<

=====

USER SPECIFIED Tc(MIN.) = 5.000
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.28	0.40	0.100	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 1.21

```

TOTAL AREA(ACRES) =      0.28    PEAK FLOW RATE(CFS) =      1.21

*****
FLOW PROCESS FROM NODE    1800.00 TO NODE    1700.00 IS CODE =   31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    239.60  DOWNSTREAM(FEET) =    238.26
FLOW LENGTH(FEET) =    268.00  MANNING'S N =    0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS    5.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    3.11
ESTIMATED PIPE DIAMETER(INCH) =    12.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =      1.21
PIPE TRAVEL TIME(MIN.) =    1.44    Tc(MIN.) =    6.44
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1700.00 =    268.00 FEET.

*****
FLOW PROCESS FROM NODE    1700.00 TO NODE    1700.00 IS CODE =   81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) =    6.44
* 25 YEAR RAINFALL INTENSITY(INCH/HR) =    4.181
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL              A         0.06     0.40     0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    0.100
SUBAREA AREA(ACRES) =    0.06    SUBAREA RUNOFF(CFS) =    0.22
EFFECTIVE AREA(ACRES) =    0.34    AREA-AVERAGED Fm(INCH/HR) =    0.04
AREA-AVERAGED Fp(INCH/HR) =    0.40  AREA-AVERAGED Ap =    0.10
TOTAL AREA(ACRES) =    0.3    PEAK FLOW RATE(CFS) =    1.27

*****
FLOW PROCESS FROM NODE    1700.00 TO NODE    1600.00 IS CODE =   31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    238.26  DOWNSTREAM(FEET) =    237.36
FLOW LENGTH(FEET) =    179.00  MANNING'S N =    0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS    6.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    3.16
ESTIMATED PIPE DIAMETER(INCH) =    12.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =    1.27
PIPE TRAVEL TIME(MIN.) =    0.94    Tc(MIN.) =    7.38
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1600.00 =    447.00 FEET.

*****
FLOW PROCESS FROM NODE    1600.00 TO NODE    1600.00 IS CODE =   81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) =    7.38
* 25 YEAR RAINFALL INTENSITY(INCH/HR) =    3.869
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL              A         0.06     0.40     0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    0.100

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SUBAREA AREA (ACRES) =      0.06      SUBAREA RUNOFF (CFS) =      0.21
EFFECTIVE AREA (ACRES) =      0.40      AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40      AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) =      0.4      PEAK FLOW RATE (CFS) =      1.38

*****
FLOW PROCESS FROM NODE 1600.00 TO NODE 1500.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 237.36 DOWNSTREAM (FEET) = 237.16
FLOW LENGTH (FEET) = 40.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.4 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 3.22
ESTIMATED PIPE DIAMETER (INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 1.38
PIPE TRAVEL TIME (MIN.) = 0.21 Tc (MIN.) = 7.59
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1500.00 = 487.00 FEET.

*****
FLOW PROCESS FROM NODE 1500.00 TO NODE 1500.00 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
MAINLINE Tc (MIN.) = 7.59
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.809
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL            A      0.18      0.40      0.100      32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 0.18      SUBAREA RUNOFF (CFS) = 0.61
EFFECTIVE AREA (ACRES) = 0.58      AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 0.6      PEAK FLOW RATE (CFS) = 1.97

*****
FLOW PROCESS FROM NODE 1500.00 TO NODE 1400.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 237.16 DOWNSTREAM (FEET) = 237.08
FLOW LENGTH (FEET) = 15.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.9 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 3.56
ESTIMATED PIPE DIAMETER (INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 1.97
PIPE TRAVEL TIME (MIN.) = 0.07 Tc (MIN.) = 7.66
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1400.00 = 502.00 FEET.

*****
FLOW PROCESS FROM NODE 1400.00 TO NODE 1400.00 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
MAINLINE Tc (MIN.) = 7.66
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.789
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN

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```

COMMERCIAL          A          1.12          0.40          0.100          32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 1.12          SUBAREA RUNOFF(CFS) = 3.78
EFFECTIVE AREA(ACRES) = 1.70          AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40          AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.7          PEAK FLOW RATE(CFS) = 5.74

*****
FLOW PROCESS FROM NODE 1400.00 TO NODE 1300.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 237.08 DOWNSTREAM(FEET) = 236.98
FLOW LENGTH(FEET) = 20.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.54
ESTIMATED PIPE DIAMETER(INCH) = 18.00          NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.74
PIPE TRAVEL TIME(MIN.) = 0.07          Tc(MIN.) = 7.73
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.00 = 522.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.00 TO NODE 1300.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.73
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.769
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/          SCS SOIL          AREA          Fp          Ap          SCS
LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL          A          0.22          0.40          0.100          32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.22          SUBAREA RUNOFF(CFS) = 0.74
EFFECTIVE AREA(ACRES) = 1.92          AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40          AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.9          PEAK FLOW RATE(CFS) = 6.44

*****
FLOW PROCESS FROM NODE 1300.00 TO NODE 1300.10 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 236.98 DOWNSTREAM(FEET) = 235.89
FLOW LENGTH(FEET) = 139.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.57
ESTIMATED PIPE DIAMETER(INCH) = 18.00          NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.44
PIPE TRAVEL TIME(MIN.) = 0.42          Tc(MIN.) = 8.15
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.10 = 661.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.10 TO NODE 1300.10 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****

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FLOW PROCESS FROM NODE 1222.00 TO NODE 1222.00 IS CODE = 22
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 139.00
USER SPECIFIED Tc(MIN.) = 5.000
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
    LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A      0.74      0.40      0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 3.19
TOTAL AREA(ACRES) = 0.74 PEAK FLOW RATE(CFS) = 3.19

*****
FLOW PROCESS FROM NODE 1222.00 TO NODE 1221.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 237.80 DOWNSTREAM(FEET) = 236.87
FLOW LENGTH(FEET) = 185.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 15.0 INCH PIPE IS 9.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.95
ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.19
PIPE TRAVEL TIME(MIN.) = 0.78 Tc(MIN.) = 5.78
LONGEST FLOWPATH FROM NODE 1222.00 TO NODE 1221.00 = 324.00 FEET.

*****
FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 10
-----
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
=====

*****
FLOW PROCESS FROM NODE 1210.00 TO NODE 1210.00 IS CODE = 22
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 185.00
USER SPECIFIED Tc(MIN.) = 5.000
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
    LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A      0.90      0.40      0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 3.87
TOTAL AREA(ACRES) = 0.90 PEAK FLOW RATE(CFS) = 3.87

*****
FLOW PROCESS FROM NODE 1210.00 TO NODE 1221.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 242.40 DOWNSTREAM(FEET) = 236.87

```


FLOW LENGTH(FEET) = 158.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.64
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.87
 PIPE TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 5.30
 LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.87	5.30	4.665	0.40 (0.04)	0.10	0.9	1210.00

LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.19	5.78	4.444	0.40 (0.04)	0.10	0.7	1222.00

LONGEST FLOWPATH FROM NODE 1222.00 TO NODE 1221.00 = 324.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.95	5.30	4.665	0.40 (0.04)	0.10	1.6	1210.00
2	6.88	5.78	4.444	0.40 (0.04)	0.10	1.6	1222.00

TOTAL AREA(ACRES) = 1.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6.95 Tc(MIN.) = 5.305
 EFFECTIVE AREA(ACRES) = 1.58 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 1.6
 LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN.) = 5.30
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.665
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.35	0.40	0.100	32

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 1.46
 EFFECTIVE AREA(ACRES) = 1.93 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 8.03

```

*****
FLOW PROCESS FROM NODE    1221.00 TO NODE    1300.10 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    236.87  DOWNSTREAM(FEET) =    235.89
FLOW LENGTH(FEET) =    196.00  MANNING'S N =    0.013
DEPTH OF FLOW IN   21.0 INCH PIPE IS   13.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    4.96
ESTIMATED PIPE DIAMETER(INCH) =    21.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =    8.03
PIPE TRAVEL TIME(MIN.) =    0.66    Tc(MIN.) =    5.96
LONGEST FLOWPATH FROM NODE    1210.00 TO NODE    1300.10 =    539.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.10 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   5.96   4.366  0.40( 0.04)  0.10         1.9   1210.00
    2         7.89   6.44   4.180  0.40( 0.04)  0.10         2.0   1222.00
LONGEST FLOWPATH FROM NODE    1210.00 TO NODE    1300.10 =    539.00 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         6.44   8.15   3.659  0.40( 0.04)  0.10         1.9   1800.00
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.10 =    661.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
    1        13.67   5.96   4.366  0.40( 0.04)  0.10         3.3   1210.00
    2        13.71   6.44   4.180  0.40( 0.04)  0.10         3.5   1222.00
    3        13.34   8.15   3.659  0.40( 0.04)  0.10         3.9   1800.00
TOTAL AREA(ACRES) =    3.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    13.71  Tc(MIN.) =    6.441
EFFECTIVE AREA(ACRES) =    3.51  AREA-AVERAGED Fm(INCH/HR) =    0.04
AREA-AVERAGED Fp(INCH/HR) =    0.40  AREA-AVERAGED Ap =    0.10
TOTAL AREA(ACRES) =    3.9
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.10 =    661.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.10 IS CODE =  12
-----
>>>>>CLEAR MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.20 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    235.89  DOWNSTREAM(FEET) =    235.65

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```

FLOW LENGTH(FEET) = 48.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 17.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.60
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 13.71
PIPE TRAVEL TIME(MIN.) = 0.14 Tc(MIN.) = 6.58
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.20 = 709.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.20 TO NODE 1300.20 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE 1120.00 TO NODE 1120.00 IS CODE = 22
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 48.00
USER SPECIFIED Tc(MIN.) = 5.000
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.18 0.40 0.100 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 0.77
TOTAL AREA(ACRES) = 0.18 PEAK FLOW RATE(CFS) = 0.77

*****
FLOW PROCESS FROM NODE 1120.00 TO NODE 1120.10 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 243.90 DOWNSTREAM(FEET) = 241.54
FLOW LENGTH(FEET) = 471.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 2.78
ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.77
PIPE TRAVEL TIME(MIN.) = 2.82 Tc(MIN.) = 7.82
LONGEST FLOWPATH FROM NODE 1120.00 TO NODE 1120.10 = 519.00 FEET.

*****
FLOW PROCESS FROM NODE 1120.10 TO NODE 1120.10 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.82
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.745
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.33 0.40 0.100 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.33 SUBAREA RUNOFF(CFS) = 1.10
EFFECTIVE AREA(ACRES) = 0.51 AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10

```



```

TOTAL AREA (ACRES) =          0.5          PEAK FLOW RATE (CFS) =          1.70

*****
FLOW PROCESS FROM NODE    1120.10 TO NODE    1300.20 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) =    241.54  DOWNSTREAM (FEET) =    235.65
FLOW LENGTH (FEET) =    31.00  MANNING'S N =    0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO    8.000
DEPTH OF FLOW IN    8.0 INCH PIPE IS    3.2 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) =    13.20
ESTIMATED PIPE DIAMETER (INCH) =    8.00    NUMBER OF PIPES =    1
PIPE-FLOW (CFS) =          1.70
PIPE TRAVEL TIME (MIN.) =    0.04    Tc (MIN.) =    7.86
LONGEST FLOWPATH FROM NODE    1120.00 TO NODE    1300.20 =    550.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.20 TO NODE    1300.20 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         1.70   7.86   3.735  0.40 ( 0.04)  0.10         0.5    1120.00
LONGEST FLOWPATH FROM NODE    1120.00 TO NODE    1300.20 =    550.00 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        13.67   6.11   4.308  0.40 ( 0.04)  0.10         3.3    1210.00
    2        13.71   6.58   4.128  0.40 ( 0.04)  0.10         3.5    1222.00
    3        13.34   8.29   3.623  0.40 ( 0.04)  0.10         3.9    1800.00
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.20 =    709.00 FEET.

** PEAK FLOW RATE TABLE **
  STREAM      Q      Tc  Intensity  Fp (Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
    1        15.19   6.11   4.308  0.40 ( 0.04)  0.10         3.7    1210.00
    2        15.29   6.58   4.128  0.40 ( 0.04)  0.10         3.9    1222.00
    3        15.13   7.86   3.735  0.40 ( 0.04)  0.10         4.3    1120.00
    4        14.99   8.29   3.623  0.40 ( 0.04)  0.10         4.4    1800.00
TOTAL AREA (ACRES) =          4.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) =          15.29    Tc (MIN.) =          6.583
EFFECTIVE AREA (ACRES) =          3.93    AREA-AVERAGED Fm (INCH/HR) =    0.04
AREA-AVERAGED Fp (INCH/HR) =    0.40    AREA-AVERAGED Ap =    0.10
TOTAL AREA (ACRES) =          4.4
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.20 =    709.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.20 TO NODE    1300.20 IS CODE = 12
-----
>>>>>CLEAR MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE    2000.00 TO NODE    2000.10 IS CODE = 21
-----

```

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00
ELEVATION DATA: UPSTREAM(FEET) = 235.00 DOWNSTREAM(FEET) = 227.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION\ CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.824

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
PUBLIC PARK	A	1.40	0.40	0.850	32	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.850

SUBAREA RUNOFF (CFS) = 5.65

TOTAL AREA (ACRES) = 1.40 PEAK FLOW RATE (CFS) = 5.65

FLOW PROCESS FROM NODE 3000.00 TO NODE 3000.00 IS CODE = 22

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>USE SPECIFIED T_c VALUE FOR INITIAL SUBAREA<<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00

USER SPECIFIED T_c (MIN.) = 5.000

* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.824

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
PUBLIC PARK	A	0.16	0.40	0.850	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.850

SUBAREA RUNOFF (CFS) = 0.65

TOTAL AREA (ACRES) = 0.16 PEAK FLOW RATE (CFS) = 0.65

=====

END OF RATIONAL METHOD ANALYSIS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* 19-124 KORNERSTONE MUSLIM CEMETERY *
* PROPOSED CONDITION *
* 100-YEAR FREQUENCY *

FILE NAME: 9124P100.DAT
TIME/DATE OF STUDY: 09:05 05/18/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

FLOW PROCESS FROM NODE 1800.00 TO NODE 1800.00 IS CODE = 22

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<

=====

USER SPECIFIED Tc(MIN.) = 5.000
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.187
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.28	0.40	0.100	52

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 1.55

```

TOTAL AREA(ACRES) =      0.28    PEAK FLOW RATE(CFS) =      1.55

*****
FLOW PROCESS FROM NODE    1800.00 TO NODE    1700.00 IS CODE =   31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    239.60  DOWNSTREAM(FEET) =    238.26
FLOW LENGTH(FEET) =    268.00  MANNING'S N =    0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS    6.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    3.30
ESTIMATED PIPE DIAMETER(INCH) =    12.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =      1.55
PIPE TRAVEL TIME(MIN.) =    1.35    Tc(MIN.) =    6.35
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1700.00 =    268.00 FEET.

*****
FLOW PROCESS FROM NODE    1700.00 TO NODE    1700.00 IS CODE =   81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) =    6.35
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =    5.394
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL              A        0.06    0.40    0.100    52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    0.100
SUBAREA AREA(ACRES) =    0.06    SUBAREA RUNOFF(CFS) =    0.29
EFFECTIVE AREA(ACRES) =    0.34    AREA-AVERAGED Fm(INCH/HR) =    0.04
AREA-AVERAGED Fp(INCH/HR) =    0.40  AREA-AVERAGED Ap =    0.10
TOTAL AREA(ACRES) =    0.3    PEAK FLOW RATE(CFS) =    1.64

*****
FLOW PROCESS FROM NODE    1700.00 TO NODE    1600.00 IS CODE =   31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    238.26  DOWNSTREAM(FEET) =    237.36
FLOW LENGTH(FEET) =    179.00  MANNING'S N =    0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS    7.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    3.35
ESTIMATED PIPE DIAMETER(INCH) =    12.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =    1.64
PIPE TRAVEL TIME(MIN.) =    0.89    Tc(MIN.) =    7.24
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1600.00 =    447.00 FEET.

*****
FLOW PROCESS FROM NODE    1600.00 TO NODE    1600.00 IS CODE =   81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) =    7.24
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =    5.004
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp      Ap      SCS
    LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL              A        0.06    0.40    0.100    52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    0.100

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SUBAREA AREA (ACRES) =      0.06      SUBAREA RUNOFF (CFS) =      0.27
EFFECTIVE AREA (ACRES) =      0.40      AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40      AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) =      0.4      PEAK FLOW RATE (CFS) =      1.79

*****
FLOW PROCESS FROM NODE 1600.00 TO NODE 1500.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 237.36 DOWNSTREAM (FEET) = 237.16
FLOW LENGTH (FEET) = 40.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.6 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 3.41
ESTIMATED PIPE DIAMETER (INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 1.79
PIPE TRAVEL TIME (MIN.) = 0.20 Tc (MIN.) = 7.44
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1500.00 = 487.00 FEET.

*****
FLOW PROCESS FROM NODE 1500.00 TO NODE 1500.00 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
MAINLINE Tc (MIN.) = 7.44
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.928
SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL            A      0.18      0.40      0.100      52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 0.18      SUBAREA RUNOFF (CFS) = 0.79
EFFECTIVE AREA (ACRES) = 0.58      AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40      AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 0.6      PEAK FLOW RATE (CFS) = 2.55

*****
FLOW PROCESS FROM NODE 1500.00 TO NODE 1400.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 237.16 DOWNSTREAM (FEET) = 237.08
FLOW LENGTH (FEET) = 15.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.0 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 3.85
ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 2.55
PIPE TRAVEL TIME (MIN.) = 0.06 Tc (MIN.) = 7.50
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1400.00 = 502.00 FEET.

*****
FLOW PROCESS FROM NODE 1400.00 TO NODE 1400.00 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
MAINLINE Tc (MIN.) = 7.50
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.904
SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN

```

```

COMMERCIAL          A          1.12          0.40          0.100          52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 1.12          SUBAREA RUNOFF(CFS) = 4.90
EFFECTIVE AREA(ACRES) = 1.70          AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40          AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.7          PEAK FLOW RATE(CFS) = 7.44

*****
FLOW PROCESS FROM NODE 1400.00 TO NODE 1300.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 237.08 DOWNSTREAM(FEET) = 236.98
FLOW LENGTH(FEET) = 20.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 12.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.88
ESTIMATED PIPE DIAMETER(INCH) = 21.00          NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.44
PIPE TRAVEL TIME(MIN.) = 0.07          Tc(MIN.) = 7.57
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.00 = 522.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.00 TO NODE 1300.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.57
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.878
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/          SCS SOIL          AREA          Fp          Ap          SCS
LAND USE          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL          A          0.22          0.40          0.100          52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.22          SUBAREA RUNOFF(CFS) = 0.96
EFFECTIVE AREA(ACRES) = 1.92          AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40          AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.9          PEAK FLOW RATE(CFS) = 8.36

*****
FLOW PROCESS FROM NODE 1300.00 TO NODE 1300.10 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 236.98 DOWNSTREAM(FEET) = 235.89
FLOW LENGTH(FEET) = 139.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.82
ESTIMATED PIPE DIAMETER(INCH) = 18.00          NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.36
PIPE TRAVEL TIME(MIN.) = 0.40          Tc(MIN.) = 7.97
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.10 = 661.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.10 TO NODE 1300.10 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****

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FLOW PROCESS FROM NODE    1222.00 TO NODE    1222.00 IS CODE =  22
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =   139.00
USER SPECIFIED Tc(MIN.) =       5.000
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =   6.187
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS
    LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A         0.74      0.40      0.100    52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =   0.100
SUBAREA RUNOFF(CFS) =         4.09
TOTAL AREA(ACRES) =         0.74   PEAK FLOW RATE(CFS) =         4.09

*****
FLOW PROCESS FROM NODE    1222.00 TO NODE    1221.00 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   237.80  DOWNSTREAM(FEET) =   236.87
FLOW LENGTH(FEET) =   185.00  MANNING'S N =   0.013
DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    4.13
ESTIMATED PIPE DIAMETER(INCH) =   15.00   NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =         4.09
PIPE TRAVEL TIME(MIN.) =    0.75   Tc(MIN.) =    5.75
LONGEST FLOWPATH FROM NODE    1222.00 TO NODE    1221.00 =   324.00 FEET.

*****
FLOW PROCESS FROM NODE    1221.00 TO NODE    1221.00 IS CODE =  10
-----
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
=====

*****
FLOW PROCESS FROM NODE    1210.00 TO NODE    1210.00 IS CODE =  22
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
USER SPECIFIED Tc(MIN.) =       5.000
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =   6.187
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS
    LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL            A         0.90      0.40      0.100    52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =   0.100
SUBAREA RUNOFF(CFS) =         4.98
TOTAL AREA(ACRES) =         0.90   PEAK FLOW RATE(CFS) =         4.98

*****
FLOW PROCESS FROM NODE    1210.00 TO NODE    1221.00 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   242.40  DOWNSTREAM(FEET) =   236.87

```

FLOW LENGTH(FEET) = 158.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.11
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.98
 PIPE TRAVEL TIME(MIN.) = 0.29 Tc(MIN.) = 5.29
 LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.98	5.29	5.991	0.40(0.04)	0.10	0.9	1210.00

LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.09	5.75	5.713	0.40(0.04)	0.10	0.7	1222.00

LONGEST FLOWPATH FROM NODE 1222.00 TO NODE 1221.00 = 324.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.93	5.29	5.991	0.40(0.04)	0.10	1.6	1210.00
2	8.84	5.75	5.713	0.40(0.04)	0.10	1.6	1222.00

TOTAL AREA(ACRES) = 1.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 8.93 Tc(MIN.) = 5.289
 EFFECTIVE AREA(ACRES) = 1.58 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 1.6
 LONGEST FLOWPATH FROM NODE 1210.00 TO NODE 1221.00 = 343.00 FEET.

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 1221.00 TO NODE 1221.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 5.29
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.991
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.35	0.40	0.100	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 1.87
 EFFECTIVE AREA(ACRES) = 1.93 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 10.34


```

*****
FLOW PROCESS FROM NODE    1221.00 TO NODE    1300.10 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    236.87  DOWNSTREAM(FEET) =    235.89
FLOW LENGTH(FEET) =    196.00  MANNING'S N =    0.013
DEPTH OF FLOW IN   21.0 INCH PIPE IS  16.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    5.17
ESTIMATED PIPE DIAMETER(INCH) =    21.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =        10.34
PIPE TRAVEL TIME(MIN.) =    0.63    Tc(MIN.) =    5.92
LONGEST FLOWPATH FROM NODE    1210.00 TO NODE    1300.10 =        539.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.10 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       10.34   5.92   5.616  0.40( 0.04)  0.10      1.9    1210.00
    2       10.16   6.38   5.381  0.40( 0.04)  0.10      2.0    1222.00
LONGEST FLOWPATH FROM NODE    1210.00 TO NODE    1300.10 =        539.00 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        8.36   7.97   4.737  0.40( 0.04)  0.10      1.9    1800.00
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.10 =        661.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
    1       17.72   5.92   5.616  0.40( 0.04)  0.10      3.4    1210.00
    2       17.77   6.38   5.381  0.40( 0.04)  0.10      3.5    1222.00
    3       17.30   7.97   4.737  0.40( 0.04)  0.10      3.9    1800.00
TOTAL AREA(ACRES) =        3.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =        17.77  Tc(MIN.) =    6.381
EFFECTIVE AREA(ACRES) =    3.53  AREA-AVERAGED Fm(INCH/HR) =    0.04
AREA-AVERAGED Fp(INCH/HR) =    0.40  AREA-AVERAGED Ap =    0.10
TOTAL AREA(ACRES) =    3.9
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.10 =        661.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.10 IS CODE =  12
-----
>>>>>CLEAR MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE    1300.10 TO NODE    1300.20 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    235.89  DOWNSTREAM(FEET) =    235.65

```

```

FLOW LENGTH(FEET) = 48.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.01
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 17.77
PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 6.51
LONGEST FLOWPATH FROM NODE 1800.00 TO NODE 1300.20 = 709.00 FEET.

*****
FLOW PROCESS FROM NODE 1300.20 TO NODE 1300.20 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE 1120.00 TO NODE 1120.00 IS CODE = 22
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>>>USE SPECIFIED Tc VALUE FOR INITIAL SUBAREA<<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 48.00
USER SPECIFIED Tc(MIN.) = 5.000
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.187
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.18 0.40 0.100 52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 1.00
TOTAL AREA(ACRES) = 0.18 PEAK FLOW RATE(CFS) = 1.00

*****
FLOW PROCESS FROM NODE 1120.00 TO NODE 1120.10 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 243.90 DOWNSTREAM(FEET) = 241.54
FLOW LENGTH(FEET) = 471.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 9.0 INCH PIPE IS 6.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 2.91
ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.00
PIPE TRAVEL TIME(MIN.) = 2.70 Tc(MIN.) = 7.70
LONGEST FLOWPATH FROM NODE 1120.00 TO NODE 1120.10 = 519.00 FEET.

*****
FLOW PROCESS FROM NODE 1120.10 TO NODE 1120.10 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 7.70
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.832
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.33 0.40 0.100 52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.33 SUBAREA RUNOFF(CFS) = 1.42
EFFECTIVE AREA(ACRES) = 0.51 AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10

```

```

TOTAL AREA (ACRES) =          0.5          PEAK FLOW RATE (CFS) =          2.20

*****
FLOW PROCESS FROM NODE    1120.10 TO NODE    1300.20 IS CODE =  31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) =    241.54  DOWNSTREAM (FEET) =    235.65
FLOW LENGTH (FEET) =    31.00  MANNING'S N =    0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO    8.000
DEPTH OF FLOW IN    8.0 INCH PIPE IS    3.7 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) =    14.12
ESTIMATED PIPE DIAMETER (INCH) =    8.00    NUMBER OF PIPES =    1
PIPE-FLOW (CFS) =          2.20
PIPE TRAVEL TIME (MIN.) =    0.04    Tc (MIN.) =    7.74
LONGEST FLOWPATH FROM NODE    1120.00 TO NODE    1300.20 =    550.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.20 TO NODE    1300.20 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         2.20   7.74   4.819  0.40 ( 0.04)  0.10         0.5   1120.00
LONGEST FLOWPATH FROM NODE    1120.00 TO NODE    1300.20 =    550.00 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        17.72   6.05   5.545  0.40 ( 0.04)  0.10         3.4   1210.00
    2        17.77   6.51   5.317  0.40 ( 0.04)  0.10         3.5   1222.00
    3        17.30   8.10   4.692  0.40 ( 0.04)  0.10         3.9   1800.00
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.20 =    709.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp (Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
    1        19.70   6.05   5.545  0.40 ( 0.04)  0.10         3.8   1210.00
    2        19.82   6.51   5.317  0.40 ( 0.04)  0.10         4.0   1222.00
    3        19.61   7.74   4.819  0.40 ( 0.04)  0.10         4.3   1120.00
    4        19.44   8.10   4.692  0.40 ( 0.04)  0.10         4.4   1800.00
TOTAL AREA (ACRES) =          4.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) =          19.82    Tc (MIN.) =          6.514
EFFECTIVE AREA (ACRES) =          3.96    AREA-AVERAGED Fm (INCH/HR) =    0.04
AREA-AVERAGED Fp (INCH/HR) =    0.40    AREA-AVERAGED Ap =    0.10
TOTAL AREA (ACRES) =          4.4
LONGEST FLOWPATH FROM NODE    1800.00 TO NODE    1300.20 =    709.00 FEET.

*****
FLOW PROCESS FROM NODE    1300.20 TO NODE    1300.20 IS CODE =  12
-----
>>>>>CLEAR MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE    2000.00 TO NODE    2000.10 IS CODE =  21
-----

```

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00
ELEVATION DATA: UPSTREAM(FEET) = 235.00 DOWNSTREAM(FEET) = 227.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION\ CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.187

SUBAREA T_c AND LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
PUBLIC PARK	A	1.40	0.40	0.850	52	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.850

SUBAREA RUNOFF (CFS) = 7.37

TOTAL AREA (ACRES) = 1.40 PEAK FLOW RATE (CFS) = 7.37

FLOW PROCESS FROM NODE 3000.00 TO NODE 3000.00 IS CODE = 22

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>>>USE SPECIFIED T_c VALUE FOR INITIAL SUBAREA<<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 91.00

USER SPECIFIED T_c (MIN.) = 5.000

* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.187

SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
PUBLIC PARK	A	0.16	0.40	0.850	52

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.850

SUBAREA RUNOFF (CFS) = 0.84

TOTAL AREA (ACRES) = 0.16 PEAK FLOW RATE (CFS) = 0.84

=====

END OF RATIONAL METHOD ANALYSIS

APPENDIX G

Detention System Analysis

SMALL AREA UNIT HYDROGRAPH MODEL

=====

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Analysis prepared by:

DRC Engineering, Inc.
160 South Old Springs Road, Suite 210
Anaheim Hills, CA 92808
714-685-6860

Problem Descriptions:

19-124
PROPOSED CONDITION DA A
10-YEAR

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA (ACRES) = 4.44
SOIL-LOSS RATE, F_m , (INCH/HR) = 0.040
LOW LOSS FRACTION = 0.062
TIME OF CONCENTRATION (MIN.) = 6.66
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY (YEARS) = 10
5-MINUTE POINT RAINFALL VALUE (INCHES) = 0.34
30-MINUTE POINT RAINFALL VALUE (INCHES) = 0.72
1-HOUR POINT RAINFALL VALUE (INCHES) = 0.95
3-HOUR POINT RAINFALL VALUE (INCHES) = 1.59
6-HOUR POINT RAINFALL VALUE (INCHES) = 2.20
24-HOUR POINT RAINFALL VALUE (INCHES) = 3.68

TOTAL CATCHMENT RUNOFF VOLUME (ACRE-FEET) = 1.15
TOTAL CATCHMENT SOIL-LOSS VOLUME (ACRE-FEET) = 0.21

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	5.0	10.0	15.0	20.0
0.02	0.0000	0.00	Q	.	.	.	.
0.13	0.0010	0.21	Q	.	.	.	.
0.24	0.0029	0.21	Q	.	.	.	.
0.35	0.0049	0.22	Q	.	.	.	.
0.46	0.0069	0.22	Q	.	.	.	.
0.57	0.0089	0.22	Q	.	.	.	.
0.68	0.0109	0.22	Q	.	.	.	.
0.79	0.0129	0.22	Q	.	.	.	.
0.90	0.0149	0.22	Q	.	.	.	.

1.02	0.0169	0.22	Q	.	.	.	.
1.13	0.0190	0.22	Q	.	.	.	.
1.24	0.0210	0.22	Q	.	.	.	.
1.35	0.0231	0.22	Q	.	.	.	.
1.46	0.0251	0.23	Q	.	.	.	.
1.57	0.0272	0.23	Q	.	.	.	.
1.68	0.0293	0.23	Q	.	.	.	.
1.79	0.0314	0.23	Q	.	.	.	.
1.90	0.0335	0.23	Q	.	.	.	.
2.01	0.0356	0.23	Q	.	.	.	.
2.13	0.0377	0.23	Q	.	.	.	.
2.24	0.0398	0.23	Q	.	.	.	.
2.35	0.0420	0.23	Q	.	.	.	.
2.46	0.0441	0.24	Q	.	.	.	.
2.57	0.0463	0.24	Q	.	.	.	.
2.68	0.0485	0.24	Q	.	.	.	.
2.79	0.0507	0.24	Q	.	.	.	.
2.90	0.0529	0.24	Q	.	.	.	.
3.01	0.0551	0.24	Q	.	.	.	.
3.12	0.0573	0.24	Q	.	.	.	.
3.24	0.0596	0.24	Q	.	.	.	.
3.35	0.0618	0.25	Q	.	.	.	.
3.46	0.0641	0.25	Q	.	.	.	.
3.57	0.0663	0.25	Q	.	.	.	.
3.68	0.0686	0.25	Q	.	.	.	.
3.79	0.0709	0.25	Q	.	.	.	.
3.90	0.0732	0.25	Q	.	.	.	.
4.01	0.0756	0.25	Q	.	.	.	.
4.12	0.0779	0.26	Q	.	.	.	.
4.23	0.0803	0.26	Q	.	.	.	.
4.35	0.0826	0.26	Q	.	.	.	.
4.46	0.0850	0.26	Q	.	.	.	.
4.57	0.0874	0.26	Q	.	.	.	.
4.68	0.0898	0.26	Q	.	.	.	.
4.79	0.0922	0.27	Q	.	.	.	.
4.90	0.0947	0.27	Q	.	.	.	.
5.01	0.0971	0.27	Q	.	.	.	.
5.12	0.0996	0.27	Q	.	.	.	.
5.23	0.1021	0.27	Q	.	.	.	.
5.34	0.1046	0.27	Q	.	.	.	.
5.46	0.1071	0.28	Q	.	.	.	.
5.57	0.1096	0.28	Q	.	.	.	.
5.68	0.1122	0.28	Q	.	.	.	.
5.79	0.1148	0.28	Q	.	.	.	.
5.90	0.1173	0.28	Q	.	.	.	.
6.01	0.1200	0.28	Q	.	.	.	.
6.12	0.1226	0.29	Q	.	.	.	.
6.23	0.1252	0.29	Q	.	.	.	.
6.34	0.1279	0.29	Q	.	.	.	.
6.45	0.1306	0.29	Q	.	.	.	.
6.57	0.1333	0.30	Q	.	.	.	.
6.68	0.1360	0.30	Q	.	.	.	.
6.79	0.1387	0.30	Q	.	.	.	.
6.90	0.1415	0.30	Q	.	.	.	.
7.01	0.1443	0.30	Q	.	.	.	.
7.12	0.1471	0.31	Q	.	.	.	.
7.23	0.1499	0.31	Q	.	.	.	.

7.34	0.1527	0.31	Q	.	.	.	.
7.45	0.1556	0.31	Q	.	.	.	.
7.56	0.1585	0.32	Q	.	.	.	.
7.68	0.1614	0.32	Q	.	.	.	.
7.79	0.1643	0.32	Q	.	.	.	.
7.90	0.1673	0.33	Q	.	.	.	.
8.01	0.1703	0.33	Q	.	.	.	.
8.12	0.1733	0.33	Q	.	.	.	.
8.23	0.1764	0.33	Q	.	.	.	.
8.34	0.1794	0.34	Q	.	.	.	.
8.45	0.1825	0.34	Q	.	.	.	.
8.56	0.1856	0.34	Q	.	.	.	.
8.67	0.1888	0.35	Q	.	.	.	.
8.79	0.1920	0.35	Q	.	.	.	.
8.90	0.1952	0.35	Q	.	.	.	.
9.01	0.1984	0.36	Q	.	.	.	.
9.12	0.2017	0.36	Q	.	.	.	.
9.23	0.2050	0.36	Q	.	.	.	.
9.34	0.2084	0.37	Q	.	.	.	.
9.45	0.2118	0.37	Q	.	.	.	.
9.56	0.2152	0.37	Q	.	.	.	.
9.67	0.2186	0.38	Q	.	.	.	.
9.78	0.2221	0.38	Q	.	.	.	.
9.90	0.2257	0.39	Q	.	.	.	.
10.01	0.2292	0.39	Q	.	.	.	.
10.12	0.2328	0.40	Q	.	.	.	.
10.23	0.2365	0.40	Q	.	.	.	.
10.34	0.2402	0.41	Q	.	.	.	.
10.45	0.2439	0.41	Q	.	.	.	.
10.56	0.2477	0.42	Q	.	.	.	.
10.67	0.2516	0.42	Q	.	.	.	.
10.78	0.2554	0.43	Q	.	.	.	.
10.89	0.2594	0.43	Q	.	.	.	.
11.01	0.2634	0.44	Q	.	.	.	.
11.12	0.2674	0.44	Q	.	.	.	.
11.23	0.2715	0.45	Q	.	.	.	.
11.34	0.2757	0.46	Q	.	.	.	.
11.45	0.2799	0.47	Q	.	.	.	.
11.56	0.2842	0.47	Q	.	.	.	.
11.67	0.2886	0.48	Q	.	.	.	.
11.78	0.2930	0.48	Q	.	.	.	.
11.89	0.2975	0.50	Q	.	.	.	.
12.00	0.3020	0.50	.Q	.	.	.	.
12.12	0.3073	0.65	.Q	.	.	.	.
12.23	0.3133	0.65	.Q	.	.	.	.
12.34	0.3193	0.67	.Q	.	.	.	.
12.45	0.3255	0.67	.Q	.	.	.	.
12.56	0.3317	0.69	.Q	.	.	.	.
12.67	0.3381	0.70	.Q	.	.	.	.
12.78	0.3446	0.71	.Q	.	.	.	.
12.89	0.3511	0.72	.Q	.	.	.	.
13.00	0.3578	0.74	.Q	.	.	.	.
13.11	0.3647	0.75	.Q	.	.	.	.
13.23	0.3717	0.77	.Q	.	.	.	.
13.34	0.3788	0.78	.Q	.	.	.	.
13.45	0.3860	0.80	.Q	.	.	.	.
13.56	0.3935	0.82	.Q	.	.	.	.

13.67	0.4011	0.84	.Q	.	.	.	.
13.78	0.4089	0.86	.Q	.	.	.	.
13.89	0.4169	0.89	.Q	.	.	.	.
14.00	0.4251	0.90	.Q	.	.	.	.
14.11	0.4336	0.94	.Q	.	.	.	.
14.22	0.4423	0.96	.Q	.	.	.	.
14.34	0.4513	1.00	. Q	.	.	.	.
14.45	0.4606	1.03	. Q	.	.	.	.
14.56	0.4702	1.08	. Q	.	.	.	.
14.67	0.4803	1.11	. Q	.	.	.	.
14.78	0.4907	1.17	. Q	.	.	.	.
14.89	0.5016	1.21	. Q	.	.	.	.
15.00	0.5131	1.30	. Q	.	.	.	.
15.11	0.5252	1.35	. Q	.	.	.	.
15.22	0.5381	1.47	. Q	.	.	.	.
15.33	0.5519	1.54	. Q	.	.	.	.
15.45	0.5657	1.47	. Q	.	.	.	.
15.56	0.5798	1.59	. Q	.	.	.	.
15.67	0.5959	1.92	. Q	.	.	.	.
15.78	0.6148	2.21	. Q	.	.	.	.
15.89	0.6399	3.25	. Q	.	.	.	.
16.00	0.6753	4.48	. Q	.	.	.	.
16.11	0.7584	13.63	.	.	. Q	.	.
16.22	0.8330	2.64	. Q	.	.	.	.
16.33	0.8531	1.73	. Q	.	.	.	.
16.44	0.8684	1.62	. Q	.	.	.	.
16.56	0.8823	1.40	. Q	.	.	.	.
16.67	0.8945	1.25	. Q	.	.	.	.
16.78	0.9054	1.14	. Q	.	.	.	.
16.89	0.9155	1.05	. Q	.	.	.	.
17.00	0.9248	0.98	.Q	.	.	.	.
17.11	0.9335	0.92	.Q	.	.	.	.
17.22	0.9417	0.87	.Q	.	.	.	.
17.33	0.9495	0.83	.Q	.	.	.	.
17.44	0.9570	0.79	.Q	.	.	.	.
17.55	0.9641	0.76	.Q	.	.	.	.
17.67	0.9709	0.73	.Q	.	.	.	.
17.78	0.9775	0.70	.Q	.	.	.	.
17.89	0.9839	0.68	.Q	.	.	.	.
18.00	0.9900	0.66	.Q	.	.	.	.
18.11	0.9954	0.51	.Q	.	.	.	.
18.22	1.0000	0.49	Q	.	.	.	.
18.33	1.0045	0.47	Q	.	.	.	.
18.44	1.0087	0.46	Q	.	.	.	.
18.55	1.0129	0.45	Q	.	.	.	.
18.66	1.0170	0.44	Q	.	.	.	.
18.77	1.0209	0.42	Q	.	.	.	.
18.89	1.0247	0.41	Q	.	.	.	.
19.00	1.0285	0.40	Q	.	.	.	.
19.11	1.0321	0.39	Q	.	.	.	.
19.22	1.0357	0.38	Q	.	.	.	.
19.33	1.0392	0.38	Q	.	.	.	.
19.44	1.0426	0.37	Q	.	.	.	.
19.55	1.0460	0.36	Q	.	.	.	.
19.66	1.0492	0.35	Q	.	.	.	.
19.77	1.0524	0.35	Q	.	.	.	.
19.89	1.0556	0.34	Q	.	.	.	.

20.00	1.0587	0.33	Q	.	.	.	.
20.11	1.0617	0.33	Q	.	.	.	.
20.22	1.0647	0.32	Q	.	.	.	.
20.33	1.0677	0.32	Q	.	.	.	.
20.44	1.0706	0.31	Q	.	.	.	.
20.55	1.0734	0.31	Q	.	.	.	.
20.66	1.0762	0.30	Q	.	.	.	.
20.77	1.0790	0.30	Q	.	.	.	.
20.88	1.0817	0.29	Q	.	.	.	.
20.99	1.0844	0.29	Q	.	.	.	.
21.11	1.0870	0.29	Q	.	.	.	.
21.22	1.0896	0.28	Q	.	.	.	.
21.33	1.0922	0.28	Q	.	.	.	.
21.44	1.0947	0.27	Q	.	.	.	.
21.55	1.0972	0.27	Q	.	.	.	.
21.66	1.0997	0.27	Q	.	.	.	.
21.77	1.1021	0.26	Q	.	.	.	.
21.88	1.1045	0.26	Q	.	.	.	.
21.99	1.1069	0.26	Q	.	.	.	.
22.11	1.1093	0.26	Q	.	.	.	.
22.22	1.1116	0.25	Q	.	.	.	.
22.33	1.1139	0.25	Q	.	.	.	.
22.44	1.1162	0.25	Q	.	.	.	.
22.55	1.1184	0.24	Q	.	.	.	.
22.66	1.1207	0.24	Q	.	.	.	.
22.77	1.1229	0.24	Q	.	.	.	.
22.88	1.1250	0.24	Q	.	.	.	.
22.99	1.1272	0.23	Q	.	.	.	.
23.10	1.1293	0.23	Q	.	.	.	.
23.22	1.1314	0.23	Q	.	.	.	.
23.33	1.1335	0.23	Q	.	.	.	.
23.44	1.1356	0.22	Q	.	.	.	.
23.55	1.1377	0.22	Q	.	.	.	.
23.66	1.1397	0.22	Q	.	.	.	.
23.77	1.1417	0.22	Q	.	.	.	.
23.88	1.1437	0.22	Q	.	.	.	.
23.99	1.1457	0.21	Q	.	.	.	.
24.10	1.1476	0.21	Q	.	.	.	.
24.21	1.1486	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
 (Note: 100% of Peak Flow Rate estimate assumed to have
 an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
=====	=====
0%	1445.2
10%	86.6
20%	20.0
30%	13.3
40%	6.7
50%	6.7
60%	6.7
70%	6.7

80%
90%

6.7
6.7

SMALL AREA UNIT HYDROGRAPH MODEL

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Analysis prepared by:

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Problem Descriptions:

19-124
PROPOSED CONDITION DA A
25-YEAR

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA (ACRES) = 4.44
SOIL-LOSS RATE, Fm, (INCH/HR) = 0.040
LOW LOSS FRACTION = 0.050
TIME OF CONCENTRATION (MIN.) = 6.58
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY (YEARS) = 25
5-MINUTE POINT RAINFALL VALUE (INCHES) = 0.40
30-MINUTE POINT RAINFALL VALUE (INCHES) = 0.87
1-HOUR POINT RAINFALL VALUE (INCHES) = 1.15
3-HOUR POINT RAINFALL VALUE (INCHES) = 1.94
6-HOUR POINT RAINFALL VALUE (INCHES) = 2.71
24-HOUR POINT RAINFALL VALUE (INCHES) = 4.49

TOTAL CATCHMENT RUNOFF VOLUME (ACRE-FEET) = 1.42
TOTAL CATCHMENT SOIL-LOSS VOLUME (ACRE-FEET) = 0.24

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	5.0	10.0	15.0	20.0
0.10	0.0011	0.26	Q	.	.	.	.
0.21	0.0034	0.26	Q	.	.	.	.
0.32	0.0058	0.26	Q	.	.	.	.
0.43	0.0081	0.26	Q	.	.	.	.
0.54	0.0105	0.26	Q	.	.	.	.
0.65	0.0129	0.26	Q	.	.	.	.
0.76	0.0153	0.27	Q	.	.	.	.
0.87	0.0177	0.27	Q	.	.	.	.
0.98	0.0201	0.27	Q	.	.	.	.

1.09	0.0226	0.27	Q	.	.	.	.
1.20	0.0250	0.27	Q	.	.	.	.
1.30	0.0275	0.27	Q	.	.	.	.
1.41	0.0299	0.27	Q	.	.	.	.
1.52	0.0324	0.27	Q	.	.	.	.
1.63	0.0349	0.28	Q	.	.	.	.
1.74	0.0374	0.28	Q	.	.	.	.
1.85	0.0399	0.28	Q	.	.	.	.
1.96	0.0425	0.28	Q	.	.	.	.
2.07	0.0450	0.28	Q	.	.	.	.
2.18	0.0476	0.28	Q	.	.	.	.
2.29	0.0501	0.28	Q	.	.	.	.
2.40	0.0527	0.29	Q	.	.	.	.
2.51	0.0553	0.29	Q	.	.	.	.
2.62	0.0579	0.29	Q	.	.	.	.
2.73	0.0605	0.29	Q	.	.	.	.
2.84	0.0632	0.29	Q	.	.	.	.
2.95	0.0658	0.29	Q	.	.	.	.
3.06	0.0685	0.29	Q	.	.	.	.
3.17	0.0711	0.30	Q	.	.	.	.
3.28	0.0738	0.30	Q	.	.	.	.
3.39	0.0765	0.30	Q	.	.	.	.
3.50	0.0793	0.30	Q	.	.	.	.
3.61	0.0820	0.30	Q	.	.	.	.
3.72	0.0847	0.30	Q	.	.	.	.
3.83	0.0875	0.31	Q	.	.	.	.
3.94	0.0903	0.31	Q	.	.	.	.
4.05	0.0931	0.31	Q	.	.	.	.
4.16	0.0959	0.31	Q	.	.	.	.
4.27	0.0987	0.31	Q	.	.	.	.
4.38	0.1016	0.31	Q	.	.	.	.
4.49	0.1044	0.32	Q	.	.	.	.
4.59	0.1073	0.32	Q	.	.	.	.
4.70	0.1102	0.32	Q	.	.	.	.
4.81	0.1131	0.32	Q	.	.	.	.
4.92	0.1161	0.33	Q	.	.	.	.
5.03	0.1190	0.33	Q	.	.	.	.
5.14	0.1220	0.33	Q	.	.	.	.
5.25	0.1250	0.33	Q	.	.	.	.
5.36	0.1280	0.33	Q	.	.	.	.
5.47	0.1310	0.34	Q	.	.	.	.
5.58	0.1341	0.34	Q	.	.	.	.
5.69	0.1371	0.34	Q	.	.	.	.
5.80	0.1402	0.34	Q	.	.	.	.
5.91	0.1433	0.34	Q	.	.	.	.
6.02	0.1465	0.35	Q	.	.	.	.
6.13	0.1496	0.35	Q	.	.	.	.
6.24	0.1528	0.35	Q	.	.	.	.
6.35	0.1560	0.35	Q	.	.	.	.
6.46	0.1592	0.36	Q	.	.	.	.
6.57	0.1625	0.36	Q	.	.	.	.
6.68	0.1658	0.36	Q	.	.	.	.
6.79	0.1690	0.36	Q	.	.	.	.
6.90	0.1724	0.37	Q	.	.	.	.
7.01	0.1757	0.37	Q	.	.	.	.
7.12	0.1791	0.37	Q	.	.	.	.
7.23	0.1825	0.38	Q	.	.	.	.

7.34	0.1859	0.38	Q	.	.	.	.
7.45	0.1893	0.38	Q	.	.	.	.
7.56	0.1928	0.39	Q	.	.	.	.
7.67	0.1963	0.39	Q	.	.	.	.
7.78	0.1999	0.39	Q	.	.	.	.
7.88	0.2034	0.39	Q	.	.	.	.
7.99	0.2070	0.40	Q	.	.	.	.
8.10	0.2107	0.40	Q	.	.	.	.
8.21	0.2143	0.41	Q	.	.	.	.
8.32	0.2180	0.41	Q	.	.	.	.
8.43	0.2217	0.41	Q	.	.	.	.
8.54	0.2255	0.42	Q	.	.	.	.
8.65	0.2293	0.42	Q	.	.	.	.
8.76	0.2331	0.42	Q	.	.	.	.
8.87	0.2370	0.43	Q	.	.	.	.
8.98	0.2409	0.43	Q	.	.	.	.
9.09	0.2448	0.44	Q	.	.	.	.
9.20	0.2488	0.44	Q	.	.	.	.
9.31	0.2528	0.45	Q	.	.	.	.
9.42	0.2569	0.45	Q	.	.	.	.
9.53	0.2610	0.46	Q	.	.	.	.
9.64	0.2652	0.46	Q	.	.	.	.
9.75	0.2693	0.47	Q	.	.	.	.
9.86	0.2736	0.47	Q	.	.	.	.
9.97	0.2779	0.48	Q	.	.	.	.
10.08	0.2822	0.48	Q	.	.	.	.
10.19	0.2866	0.49	Q	.	.	.	.
10.30	0.2910	0.49	Q	.	.	.	.
10.41	0.2955	0.50	.Q	.	.	.	.
10.52	0.3001	0.50	.Q	.	.	.	.
10.63	0.3047	0.51	.Q	.	.	.	.
10.74	0.3094	0.52	.Q	.	.	.	.
10.85	0.3141	0.53	.Q	.	.	.	.
10.96	0.3189	0.53	.Q	.	.	.	.
11.07	0.3237	0.54	.Q	.	.	.	.
11.17	0.3287	0.55	.Q	.	.	.	.
11.28	0.3337	0.56	.Q	.	.	.	.
11.39	0.3387	0.56	.Q	.	.	.	.
11.50	0.3439	0.57	.Q	.	.	.	.
11.61	0.3491	0.58	.Q	.	.	.	.
11.72	0.3544	0.59	.Q	.	.	.	.
11.83	0.3598	0.60	.Q	.	.	.	.
11.94	0.3653	0.61	.Q	.	.	.	.
12.05	0.3709	0.62	.Q	.	.	.	.
12.16	0.3774	0.84	.Q	.	.	.	.
12.27	0.3851	0.84	.Q	.	.	.	.
12.38	0.3928	0.86	.Q	.	.	.	.
12.49	0.4006	0.87	.Q	.	.	.	.
12.60	0.4086	0.89	.Q	.	.	.	.
12.71	0.4167	0.90	.Q	.	.	.	.
12.82	0.4249	0.92	.Q	.	.	.	.
12.93	0.4333	0.93	.Q	.	.	.	.
13.04	0.4419	0.95	.Q	.	.	.	.
13.15	0.4505	0.97	.Q	.	.	.	.
13.26	0.4594	0.99	.Q	.	.	.	.
13.37	0.4685	1.00	. Q	.	.	.	.
13.48	0.4777	1.03	. Q	.	.	.	.

13.59	0.4871	1.05	. Q	.	.	.	.
13.70	0.4968	1.08	. Q	.	.	.	.
13.81	0.5067	1.10	. Q	.	.	.	.
13.92	0.5168	1.14	. Q	.	.	.	.
14.03	0.5272	1.16	. Q	.	.	.	.
14.14	0.5378	1.19	. Q	.	.	.	.
14.25	0.5487	1.21	. Q	.	.	.	.
14.35	0.5599	1.26	. Q	.	.	.	.
14.46	0.5715	1.29	. Q	.	.	.	.
14.57	0.5835	1.36	. Q	.	.	.	.
14.68	0.5960	1.39	. Q	.	.	.	.
14.79	0.6090	1.48	. Q	.	.	.	.
14.90	0.6226	1.52	. Q	.	.	.	.
15.01	0.6369	1.63	. Q	.	.	.	.
15.12	0.6519	1.69	. Q	.	.	.	.
15.23	0.6679	1.84	. Q	.	.	.	.
15.34	0.6850	1.93	. Q	.	.	.	.
15.45	0.7020	1.83	. Q	.	.	.	.
15.56	0.7193	1.97	. Q	.	.	.	.
15.67	0.7390	2.38	. Q	.	.	.	.
15.78	0.7625	2.80	. Q	.	.	.	.
15.89	0.7937	4.10	. Q	.	.	.	.
16.00	0.8376	5.59	. .Q	.	.	.	.
16.11	0.9366	16.24	.	.	.	. Q	.
16.22	1.0254	3.35	. Q	.	.	.	.
16.33	1.0503	2.15	. Q	.	.	.	.
16.44	1.0691	1.99	. Q	.	.	.	.
16.55	1.0861	1.76	. Q	.	.	.	.
16.66	1.1012	1.57	. Q	.	.	.	.
16.77	1.1148	1.43	. Q	.	.	.	.
16.88	1.1273	1.32	. Q	.	.	.	.
16.99	1.1389	1.24	. Q	.	.	.	.
17.10	1.1499	1.17	. Q	.	.	.	.
17.21	1.1603	1.12	. Q	.	.	.	.
17.32	1.1702	1.07	. Q	.	.	.	.
17.43	1.1796	1.02	. Q	.	.	.	.
17.54	1.1886	0.98	.Q	.	.	.	.
17.64	1.1973	0.94	.Q	.	.	.	.
17.75	1.2057	0.91	.Q	.	.	.	.
17.86	1.2138	0.88	.Q	.	.	.	.
17.97	1.2217	0.85	.Q	.	.	.	.
18.08	1.2290	0.77	.Q	.	.	.	.
18.19	1.2353	0.60	.Q	.	.	.	.
18.30	1.2406	0.59	.Q	.	.	.	.
18.41	1.2459	0.57	.Q	.	.	.	.
18.52	1.2509	0.55	.Q	.	.	.	.
18.63	1.2559	0.54	.Q	.	.	.	.
18.74	1.2607	0.52	.Q	.	.	.	.
18.85	1.2653	0.51	.Q	.	.	.	.
18.96	1.2699	0.50	Q	.	.	.	.
19.07	1.2743	0.48	Q	.	.	.	.
19.18	1.2787	0.47	Q	.	.	.	.
19.29	1.2829	0.46	Q	.	.	.	.
19.40	1.2870	0.45	Q	.	.	.	.
19.51	1.2911	0.44	Q	.	.	.	.
19.62	1.2951	0.43	Q	.	.	.	.
19.73	1.2990	0.43	Q	.	.	.	.

19.84	1.3028	0.42	Q	.	.	.	.
19.95	1.3066	0.41	Q	.	.	.	.
20.06	1.3103	0.40	Q	.	.	.	.
20.17	1.3139	0.40	Q	.	.	.	.
20.28	1.3175	0.39	Q	.	.	.	.
20.39	1.3210	0.38	Q	.	.	.	.
20.50	1.3244	0.38	Q	.	.	.	.
20.61	1.3278	0.37	Q	.	.	.	.
20.72	1.3312	0.37	Q	.	.	.	.
20.83	1.3345	0.36	Q	.	.	.	.
20.93	1.3377	0.36	Q	.	.	.	.
21.04	1.3409	0.35	Q	.	.	.	.
21.15	1.3441	0.35	Q	.	.	.	.
21.26	1.3472	0.34	Q	.	.	.	.
21.37	1.3503	0.34	Q	.	.	.	.
21.48	1.3533	0.33	Q	.	.	.	.
21.59	1.3563	0.33	Q	.	.	.	.
21.70	1.3592	0.32	Q	.	.	.	.
21.81	1.3621	0.32	Q	.	.	.	.
21.92	1.3650	0.32	Q	.	.	.	.
22.03	1.3679	0.31	Q	.	.	.	.
22.14	1.3707	0.31	Q	.	.	.	.
22.25	1.3735	0.31	Q	.	.	.	.
22.36	1.3762	0.30	Q	.	.	.	.
22.47	1.3789	0.30	Q	.	.	.	.
22.58	1.3816	0.30	Q	.	.	.	.
22.69	1.3843	0.29	Q	.	.	.	.
22.80	1.3869	0.29	Q	.	.	.	.
22.91	1.3895	0.29	Q	.	.	.	.
23.02	1.3921	0.28	Q	.	.	.	.
23.13	1.3947	0.28	Q	.	.	.	.
23.24	1.3972	0.28	Q	.	.	.	.
23.35	1.3997	0.27	Q	.	.	.	.
23.46	1.4022	0.27	Q	.	.	.	.
23.57	1.4046	0.27	Q	.	.	.	.
23.68	1.4071	0.27	Q	.	.	.	.
23.79	1.4095	0.26	Q	.	.	.	.
23.90	1.4119	0.26	Q	.	.	.	.
24.01	1.4142	0.26	Q	.	.	.	.
24.12	1.4154	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
 (Note: 100% of Peak Flow Rate estimate assumed to have
 an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.0
10%	98.7
20%	26.3
30%	13.2
40%	6.6
50%	6.6
60%	6.6

70%
80%
90%

6.6
6.6
6.6

SMALL AREA UNIT HYDROGRAPH MODEL

=====

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Analysis prepared by:

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Anaheim Hills, CA 92808
714-685-6860

Problem Descriptions:

19-124
PROPOSED CONDITION DA A
100-YEAR

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA (ACRES) = 4.44
SOIL-LOSS RATE, F_m , (INCH/HR) = 0.040
LOW LOSS FRACTION = 0.041
TIME OF CONCENTRATION (MIN.) = 6.51
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
RETURN FREQUENCY (YEARS) = 100
5-MINUTE POINT RAINFALL VALUE (INCHES) = 0.52
30-MINUTE POINT RAINFALL VALUE (INCHES) = 1.09
1-HOUR POINT RAINFALL VALUE (INCHES) = 1.45
3-HOUR POINT RAINFALL VALUE (INCHES) = 2.43
6-HOUR POINT RAINFALL VALUE (INCHES) = 3.36
24-HOUR POINT RAINFALL VALUE (INCHES) = 5.63

TOTAL CATCHMENT RUNOFF VOLUME (ACRE-FEET) = 1.79
TOTAL CATCHMENT SOIL-LOSS VOLUME (ACRE-FEET) = 0.29

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	7.5	15.0	22.5	30.0
0.05	0.0007	0.33	Q	.	.	.	.
0.16	0.0037	0.34	Q	.	.	.	.
0.27	0.0067	0.34	Q	.	.	.	.
0.38	0.0097	0.34	Q	.	.	.	.
0.48	0.0128	0.34	Q	.	.	.	.
0.59	0.0158	0.34	Q	.	.	.	.
0.70	0.0189	0.34	Q	.	.	.	.
0.81	0.0220	0.34	Q	.	.	.	.
0.92	0.0251	0.35	Q	.	.	.	.

1.03	0.0282	0.35	Q	.	.	.	.
1.14	0.0313	0.35	Q	.	.	.	.
1.24	0.0344	0.35	Q	.	.	.	.
1.35	0.0376	0.35	Q	.	.	.	.
1.46	0.0408	0.35	Q	.	.	.	.
1.57	0.0439	0.36	Q	.	.	.	.
1.68	0.0471	0.36	Q	.	.	.	.
1.79	0.0503	0.36	Q	.	.	.	.
1.89	0.0536	0.36	Q	.	.	.	.
2.00	0.0568	0.36	Q	.	.	.	.
2.11	0.0601	0.36	Q	.	.	.	.
2.22	0.0633	0.37	Q	.	.	.	.
2.33	0.0666	0.37	Q	.	.	.	.
2.44	0.0699	0.37	Q	.	.	.	.
2.55	0.0732	0.37	Q	.	.	.	.
2.65	0.0766	0.37	Q	.	.	.	.
2.76	0.0799	0.37	Q	.	.	.	.
2.87	0.0833	0.38	Q	.	.	.	.
2.98	0.0867	0.38	Q	.	.	.	.
3.09	0.0901	0.38	Q	.	.	.	.
3.20	0.0935	0.38	Q	.	.	.	.
3.31	0.0970	0.39	Q	.	.	.	.
3.41	0.1004	0.39	Q	.	.	.	.
3.52	0.1039	0.39	Q	.	.	.	.
3.63	0.1074	0.39	Q	.	.	.	.
3.74	0.1109	0.39	Q	.	.	.	.
3.85	0.1145	0.40	Q	.	.	.	.
3.96	0.1180	0.40	Q	.	.	.	.
4.06	0.1216	0.40	Q	.	.	.	.
4.17	0.1252	0.40	Q	.	.	.	.
4.28	0.1288	0.40	Q	.	.	.	.
4.39	0.1325	0.41	Q	.	.	.	.
4.50	0.1361	0.41	Q	.	.	.	.
4.61	0.1398	0.41	Q	.	.	.	.
4.72	0.1435	0.41	Q	.	.	.	.
4.82	0.1472	0.42	Q	.	.	.	.
4.93	0.1510	0.42	Q	.	.	.	.
5.04	0.1547	0.42	Q	.	.	.	.
5.15	0.1585	0.42	Q	.	.	.	.
5.26	0.1624	0.43	Q	.	.	.	.
5.37	0.1662	0.43	Q	.	.	.	.
5.48	0.1701	0.43	Q	.	.	.	.
5.58	0.1740	0.43	Q	.	.	.	.
5.69	0.1779	0.44	Q	.	.	.	.
5.80	0.1818	0.44	Q	.	.	.	.
5.91	0.1858	0.44	Q	.	.	.	.
6.02	0.1898	0.45	Q	.	.	.	.
6.13	0.1938	0.45	Q	.	.	.	.
6.23	0.1979	0.45	Q	.	.	.	.
6.34	0.2019	0.46	Q	.	.	.	.
6.45	0.2060	0.46	Q	.	.	.	.
6.56	0.2102	0.46	Q	.	.	.	.
6.67	0.2144	0.47	Q	.	.	.	.
6.78	0.2185	0.47	Q	.	.	.	.
6.89	0.2228	0.47	Q	.	.	.	.
6.99	0.2270	0.48	Q	.	.	.	.
7.10	0.2313	0.48	Q	.	.	.	.

7.21	0.2356	0.48	Q	.	.	.	.
7.32	0.2400	0.49	Q	.	.	.	.
7.43	0.2444	0.49	Q	.	.	.	.
7.54	0.2488	0.49	Q	.	.	.	.
7.65	0.2533	0.50	Q	.	.	.	.
7.75	0.2578	0.50	Q	.	.	.	.
7.86	0.2623	0.51	Q	.	.	.	.
7.97	0.2669	0.51	Q	.	.	.	.
8.08	0.2715	0.52	Q	.	.	.	.
8.19	0.2761	0.52	Q	.	.	.	.
8.30	0.2808	0.53	Q	.	.	.	.
8.40	0.2856	0.53	Q	.	.	.	.
8.51	0.2903	0.54	Q	.	.	.	.
8.62	0.2951	0.54	Q	.	.	.	.
8.73	0.3000	0.55	Q	.	.	.	.
8.84	0.3049	0.55	Q	.	.	.	.
8.95	0.3099	0.56	Q	.	.	.	.
9.06	0.3149	0.56	Q	.	.	.	.
9.16	0.3199	0.57	Q	.	.	.	.
9.27	0.3250	0.57	Q	.	.	.	.
9.38	0.3302	0.58	Q	.	.	.	.
9.49	0.3354	0.58	Q	.	.	.	.
9.60	0.3406	0.59	Q	.	.	.	.
9.71	0.3459	0.59	Q	.	.	.	.
9.82	0.3513	0.60	Q	.	.	.	.
9.92	0.3567	0.61	Q	.	.	.	.
10.03	0.3622	0.62	Q	.	.	.	.
10.14	0.3678	0.62	Q	.	.	.	.
10.25	0.3734	0.63	Q	.	.	.	.
10.36	0.3790	0.64	Q	.	.	.	.
10.47	0.3848	0.65	Q	.	.	.	.
10.57	0.3906	0.65	Q	.	.	.	.
10.68	0.3965	0.66	Q	.	.	.	.
10.79	0.4025	0.67	Q	.	.	.	.
10.90	0.4085	0.68	Q	.	.	.	.
11.01	0.4146	0.69	Q	.	.	.	.
11.12	0.4208	0.70	Q	.	.	.	.
11.23	0.4271	0.70	Q	.	.	.	.
11.33	0.4335	0.72	Q	.	.	.	.
11.44	0.4399	0.72	Q	.	.	.	.
11.55	0.4465	0.74	Q	.	.	.	.
11.66	0.4532	0.75	Q	.	.	.	.
11.77	0.4599	0.76	.Q	.	.	.	.
11.88	0.4668	0.77	.Q	.	.	.	.
11.99	0.4738	0.79	.Q	.	.	.	.
12.09	0.4812	0.86	.Q	.	.	.	.
12.20	0.4896	1.02	.Q	.	.	.	.
12.31	0.4988	1.03	.Q	.	.	.	.
12.42	0.5081	1.05	.Q	.	.	.	.
12.53	0.5176	1.06	.Q	.	.	.	.
12.64	0.5273	1.09	.Q	.	.	.	.
12.74	0.5371	1.10	.Q	.	.	.	.
12.85	0.5470	1.13	.Q	.	.	.	.
12.96	0.5572	1.14	.Q	.	.	.	.
13.07	0.5675	1.17	.Q	.	.	.	.
13.18	0.5781	1.18	.Q	.	.	.	.
13.29	0.5888	1.22	.Q	.	.	.	.

13.40	0.5998	1.23	.Q	.	.	.	.
13.50	0.6110	1.27	.Q	.	.	.	.
13.61	0.6225	1.29	.Q	.	.	.	.
13.72	0.6342	1.33	.Q	.	.	.	.
13.83	0.6463	1.35	.Q	.	.	.	.
13.94	0.6586	1.40	.Q	.	.	.	.
14.05	0.6713	1.43	.Q	.	.	.	.
14.16	0.6844	1.49	.Q	.	.	.	.
14.26	0.6979	1.52	. Q	.	.	.	.
14.37	0.7118	1.59	. Q	.	.	.	.
14.48	0.7262	1.63	. Q	.	.	.	.
14.59	0.7412	1.71	. Q	.	.	.	.
14.70	0.7567	1.75	. Q	.	.	.	.
14.81	0.7729	1.86	. Q	.	.	.	.
14.91	0.7898	1.92	. Q	.	.	.	.
15.02	0.8076	2.05	. Q	.	.	.	.
15.13	0.8264	2.13	. Q	.	.	.	.
15.24	0.8463	2.32	. Q	.	.	.	.
15.35	0.8676	2.44	. Q	.	.	.	.
15.46	0.8893	2.40	. Q	.	.	.	.
15.57	0.9117	2.58	. Q	.	.	.	.
15.67	0.9371	3.10	. Q	.	.	.	.
15.78	0.9667	3.50	. Q	.	.	.	.
15.89	1.0049	5.02	. Q	.	.	.	.
16.00	1.0584	6.91	. Q.	.	.	.	.
16.11	1.1844	21.18	. Q	.	Q	.	.
16.22	1.2976	4.08	. Q	.	.	.	.
16.33	1.3285	2.81	. Q	.	.	.	.
16.43	1.3523	2.50	. Q	.	.	.	.
16.54	1.3735	2.22	. Q	.	.	.	.
16.65	1.3923	1.98	. Q	.	.	.	.
16.76	1.4093	1.80	. Q	.	.	.	.
16.87	1.4248	1.67	. Q	.	.	.	.
16.98	1.4392	1.55	. Q	.	.	.	.
17.08	1.4528	1.46	.Q	.	.	.	.
17.19	1.4655	1.38	.Q	.	.	.	.
17.30	1.4775	1.31	.Q	.	.	.	.
17.41	1.4890	1.25	.Q	.	.	.	.
17.52	1.5000	1.20	.Q	.	.	.	.
17.63	1.5105	1.15	.Q	.	.	.	.
17.74	1.5207	1.11	.Q	.	.	.	.
17.84	1.5305	1.07	.Q	.	.	.	.
17.95	1.5400	1.04	.Q	.	.	.	.
18.06	1.5492	1.01	.Q	.	.	.	.
18.17	1.5572	0.78	.Q	.	.	.	.
18.28	1.5641	0.75	.Q	.	.	.	.
18.39	1.5707	0.73	Q	.	.	.	.
18.50	1.5772	0.71	Q	.	.	.	.
18.60	1.5835	0.69	Q	.	.	.	.
18.71	1.5896	0.67	Q	.	.	.	.
18.82	1.5956	0.66	Q	.	.	.	.
18.93	1.6014	0.64	Q	.	.	.	.
19.04	1.6071	0.63	Q	.	.	.	.
19.15	1.6126	0.61	Q	.	.	.	.
19.26	1.6180	0.60	Q	.	.	.	.
19.36	1.6233	0.59	Q	.	.	.	.
19.47	1.6285	0.57	Q	.	.	.	.

19.58	1.6336	0.56	Q	.	.	.	.
19.69	1.6386	0.55	Q	.	.	.	.
19.80	1.6435	0.54	Q	.	.	.	.
19.91	1.6484	0.53	Q	.	.	.	.
20.01	1.6531	0.52	Q	.	.	.	.
20.12	1.6577	0.51	Q	.	.	.	.
20.23	1.6623	0.51	Q	.	.	.	.
20.34	1.6668	0.50	Q	.	.	.	.
20.45	1.6712	0.49	Q	.	.	.	.
20.56	1.6756	0.48	Q	.	.	.	.
20.67	1.6799	0.47	Q	.	.	.	.
20.77	1.6841	0.47	Q	.	.	.	.
20.88	1.6883	0.46	Q	.	.	.	.
20.99	1.6924	0.45	Q	.	.	.	.
21.10	1.6964	0.45	Q	.	.	.	.
21.21	1.7004	0.44	Q	.	.	.	.
21.32	1.7044	0.44	Q	.	.	.	.
21.42	1.7083	0.43	Q	.	.	.	.
21.53	1.7121	0.43	Q	.	.	.	.
21.64	1.7159	0.42	Q	.	.	.	.
21.75	1.7197	0.42	Q	.	.	.	.
21.86	1.7234	0.41	Q	.	.	.	.
21.97	1.7270	0.41	Q	.	.	.	.
22.08	1.7306	0.40	Q	.	.	.	.
22.18	1.7342	0.40	Q	.	.	.	.
22.29	1.7378	0.39	Q	.	.	.	.
22.40	1.7413	0.39	Q	.	.	.	.
22.51	1.7447	0.38	Q	.	.	.	.
22.62	1.7481	0.38	Q	.	.	.	.
22.73	1.7515	0.38	Q	.	.	.	.
22.84	1.7549	0.37	Q	.	.	.	.
22.94	1.7582	0.37	Q	.	.	.	.
23.05	1.7615	0.36	Q	.	.	.	.
23.16	1.7647	0.36	Q	.	.	.	.
23.27	1.7680	0.36	Q	.	.	.	.
23.38	1.7712	0.35	Q	.	.	.	.
23.49	1.7743	0.35	Q	.	.	.	.
23.60	1.7775	0.35	Q	.	.	.	.
23.70	1.7806	0.35	Q	.	.	.	.
23.81	1.7837	0.34	Q	.	.	.	.
23.92	1.7867	0.34	Q	.	.	.	.
24.03	1.7897	0.34	Q	.	.	.	.
24.14	1.7912	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
 (Note: 100% of Peak Flow Rate estimate assumed to have
 an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
=====	=====
0%	1445.2
10%	91.1
20%	19.5
30%	13.0

40%	6.5
50%	6.5
60%	6.5
70%	6.5
80%	6.5
90%	6.5

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

Tuesday, 05 / 18 / 2021

Pond No. 1 - detention

Pond Data

UG Chambers -Invert elev. = 235.30 ft, Rise x Span = 6.00 x 6.00 ft, Barrel Len = 380.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	235.30	n/a	0	0
0.60	235.90	n/a	561	561
1.20	236.50	n/a	970	1,531
1.80	237.10	n/a	1,182	2,713
2.40	237.70	n/a	1,302	4,014
3.00	238.30	n/a	1,360	5,374
3.60	238.90	n/a	1,360	6,734
4.20	239.50	n/a	1,301	8,036
4.80	240.10	n/a	1,181	9,217
5.40	240.70	n/a	971	10,188
6.00	241.30	n/a	559	10,746

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	10.00	0.00	0.00
Span (in)	= 24.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 235.30	235.40	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.00	0.00	0.00	0.00
Crest El. (ft)	= 240.30	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by 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	235.30	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.60	561	235.90	0.84 ic	0.80 ic	---	---	0.00	---	---	---	---	1.000	1.804
1.20	1,531	236.50	2.08 ic	2.05 ic	---	---	0.00	---	---	---	---	1.000	3.053
1.80	2,713	237.10	2.81 ic	2.77 ic	---	---	0.00	---	---	---	---	1.000	3.765
2.40	4,014	237.70	3.39 ic	3.36 ic	---	---	0.00	---	---	---	---	1.000	4.356
3.00	5,374	238.30	3.90 ic	3.87 ic	---	---	0.00	---	---	---	---	1.000	4.870
3.60	6,734	238.90	4.33 ic	4.33 ic	---	---	0.00	---	---	---	---	1.000	5.327
4.20	8,036	239.50	4.75 ic	4.75 ic	---	---	0.00	---	---	---	---	1.000	5.748
4.80	9,217	240.10	5.16 ic	5.14 ic	---	---	0.00	---	---	---	---	1.000	6.140
5.40	10,188	240.70	5.61 ic	5.50 ic	---	---	2.53	---	---	---	---	1.000	9.025
6.00	10,746	241.30	5.91 ic	5.84 ic	---	---	9.99	---	---	---	---	1.000	16.83

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

Tuesday, 05 / 18 / 2021

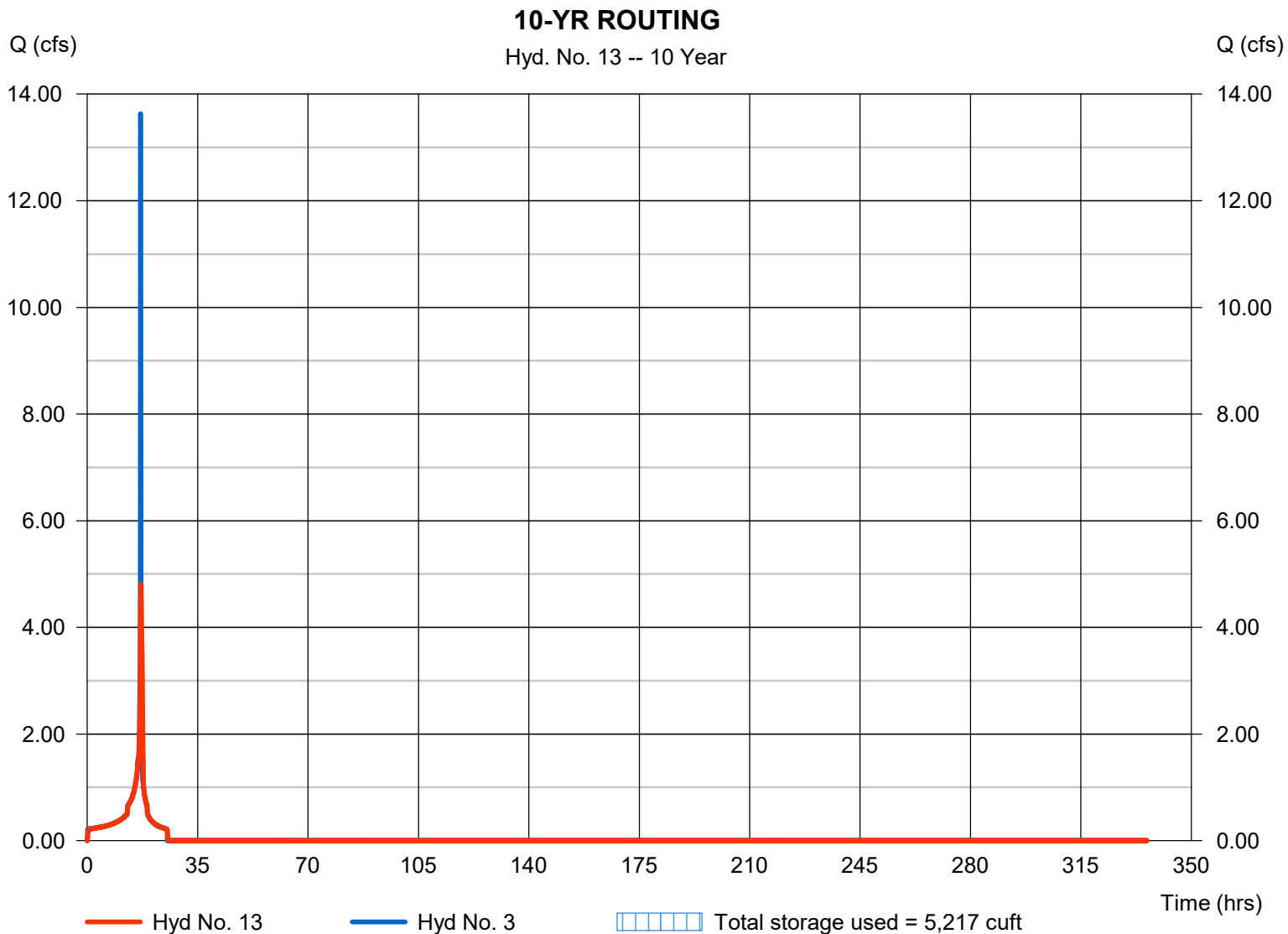
Hyd. No. 13

10-YR ROUTING

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Time interval = 7 min
Inflow hyd. No. = 3 - 10-YR
Reservoir name = detention

Peak discharge = 4.809 cfs
Time to peak = 17.03 hrs
Hyd. volume = 52,584 cuft
Max. Elevation = 238.43 ft
Max. Storage = 5,217 cuft

Storage Indication method used.



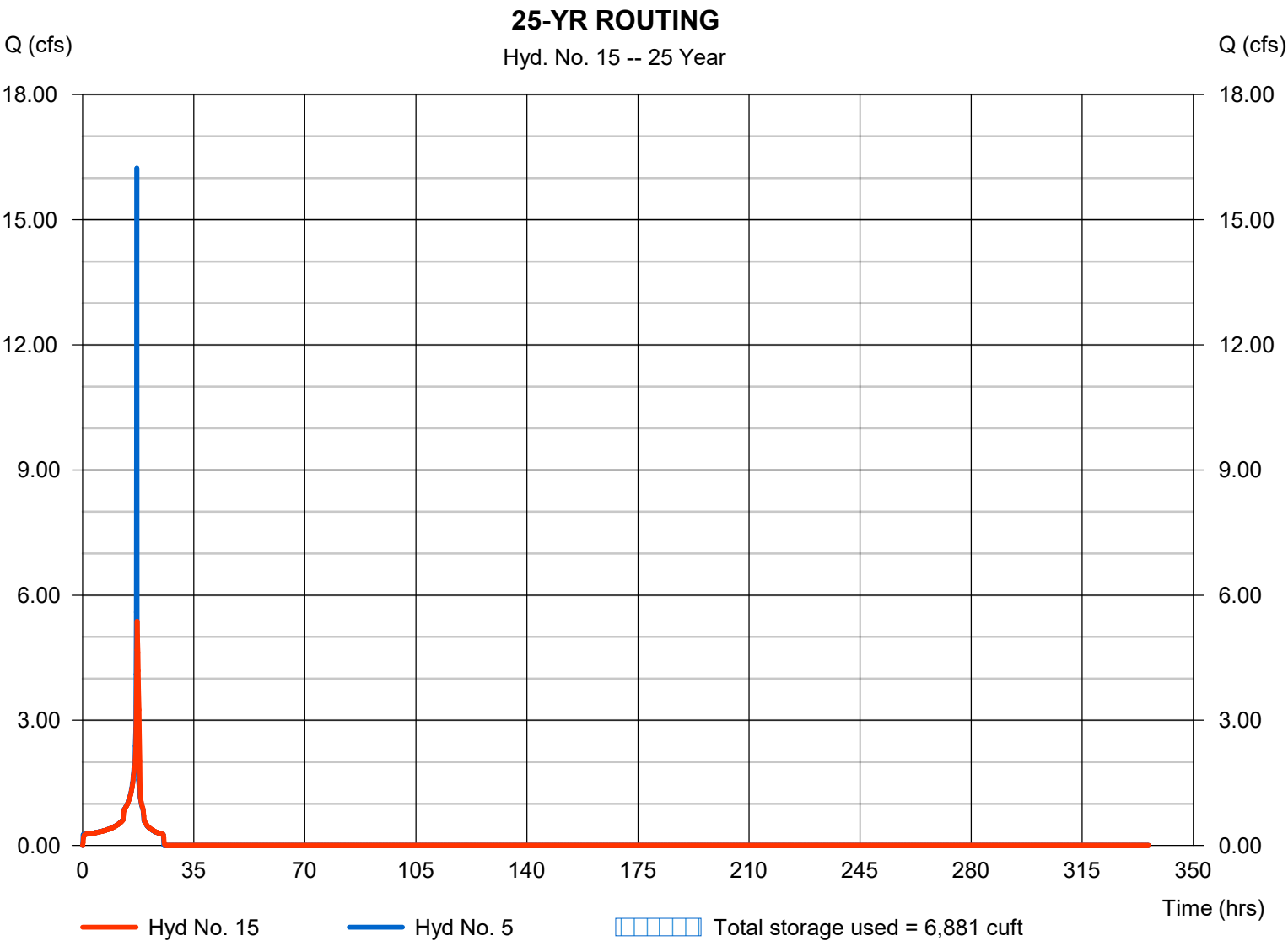
Hydrograph Report

Hyd. No. 15

25-YR ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 5.376 cfs
Storm frequency	= 25 yrs	Time to peak	= 17.15 hrs
Time interval	= 7 min	Hyd. volume	= 65,482 cuft
Inflow hyd. No.	= 5 - 25-YR	Max. Elevation	= 239.16 ft
Reservoir name	= detention	Max. Storage	= 6,881 cuft

Storage Indication method used.



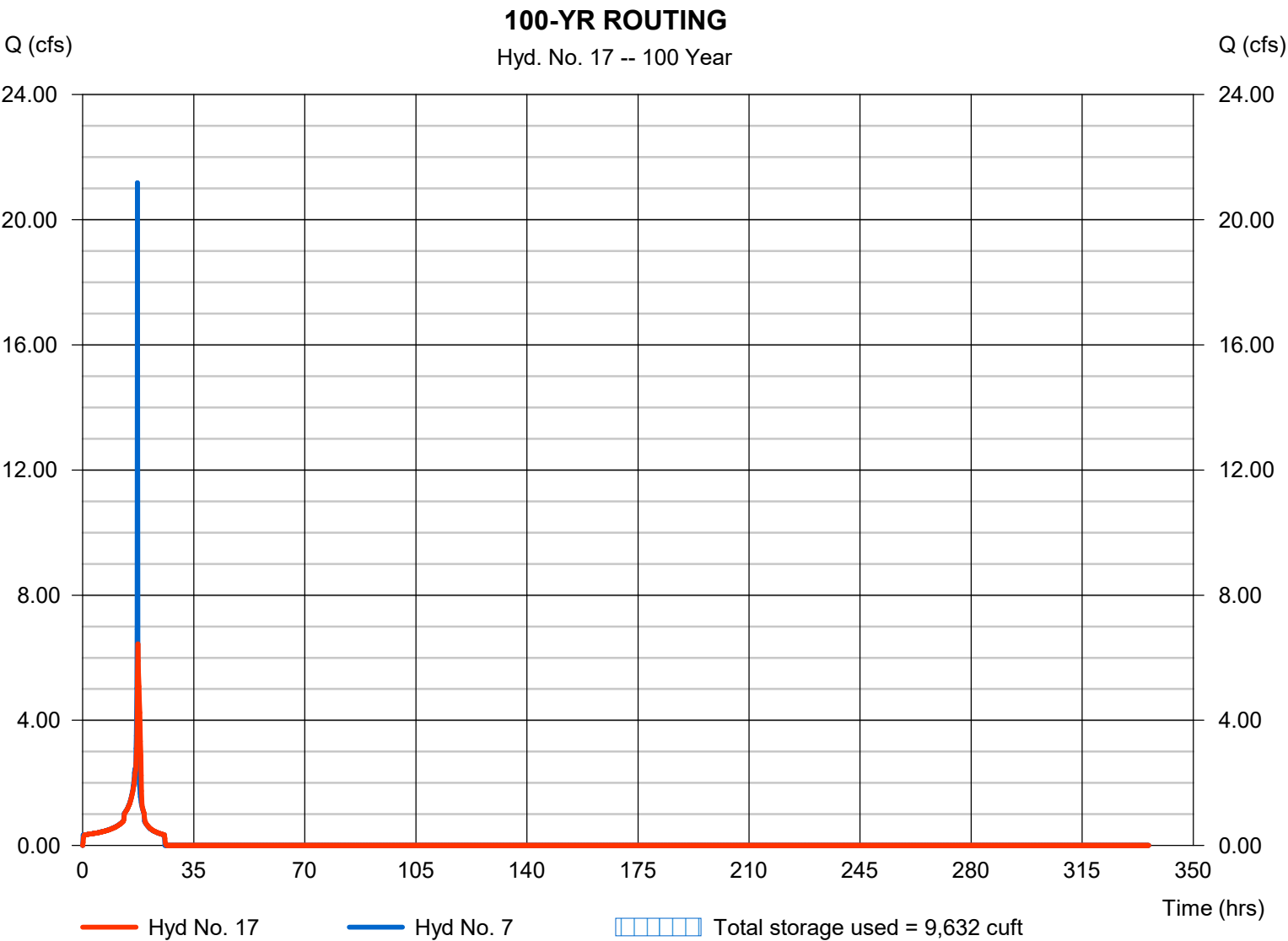
Hydrograph Report

Hyd. No. 17

100-YR ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 6.443 cfs
Storm frequency	= 100 yrs	Time to peak	= 17.38 hrs
Time interval	= 7 min	Hyd. volume	= 83,802 cuft
Inflow hyd. No.	= 7 - 100-YR	Max. Elevation	= 240.66 ft
Reservoir name	= detention	Max. Storage	= 9,632 cuft

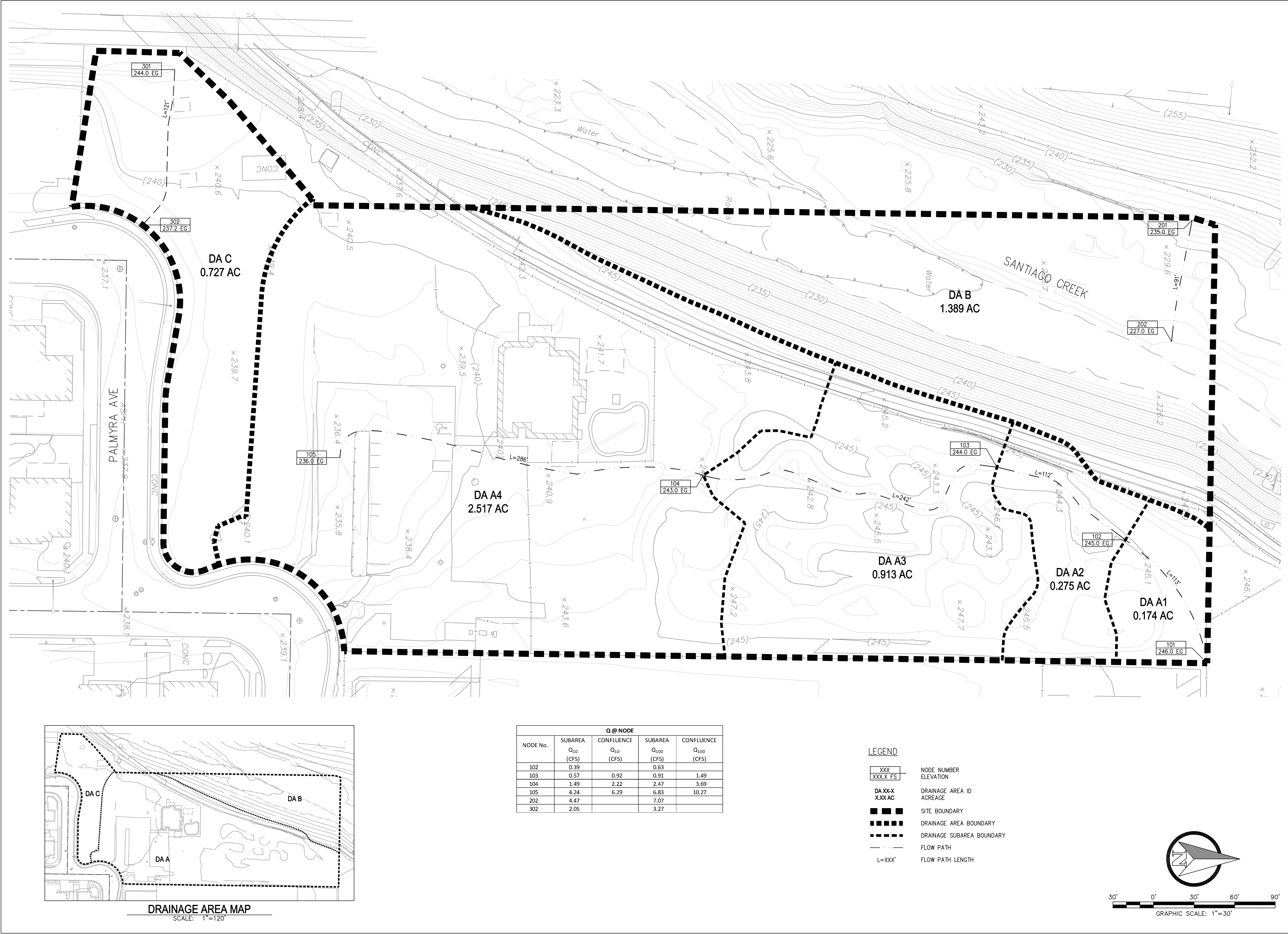
Storage Indication method used.



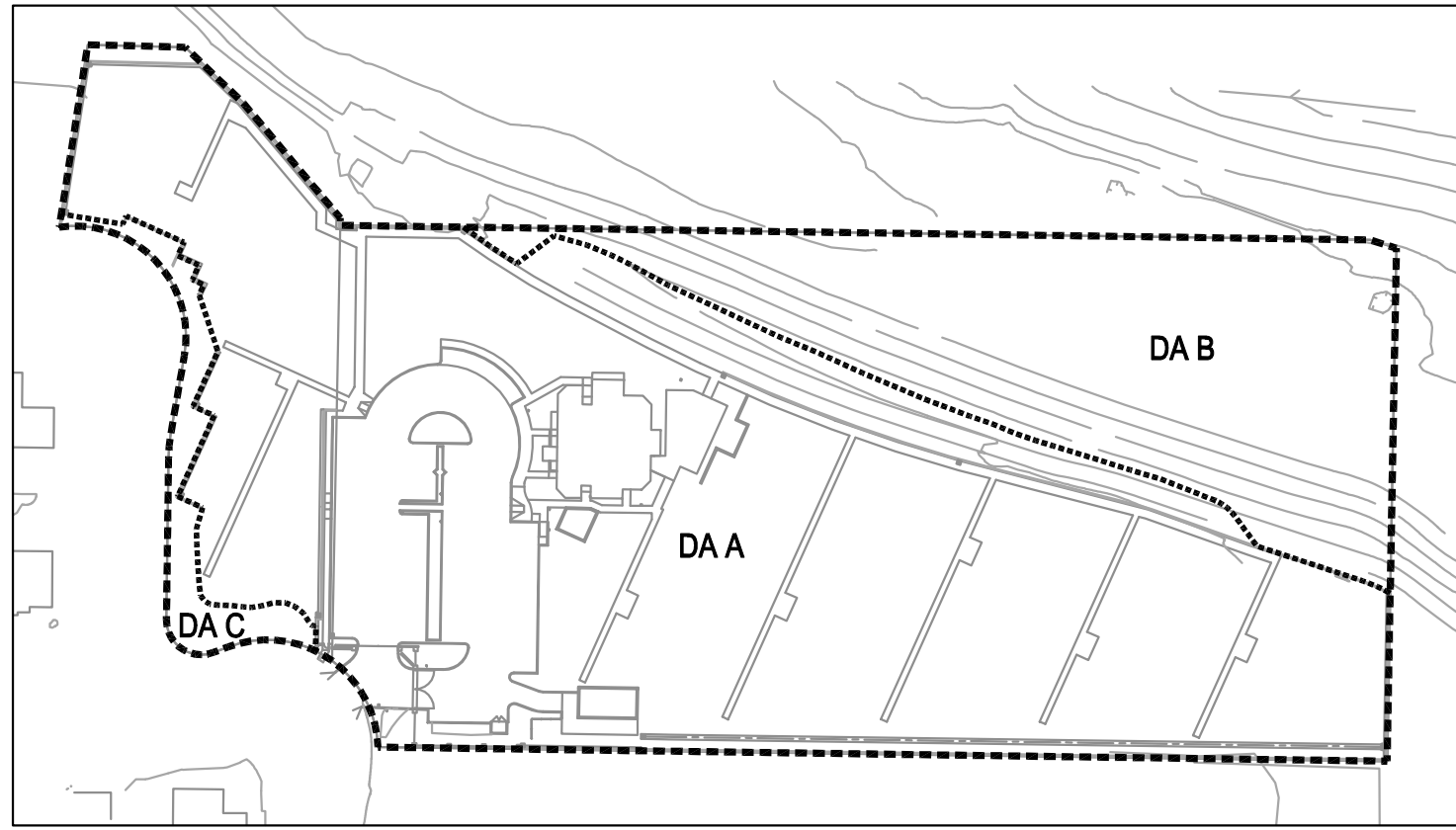
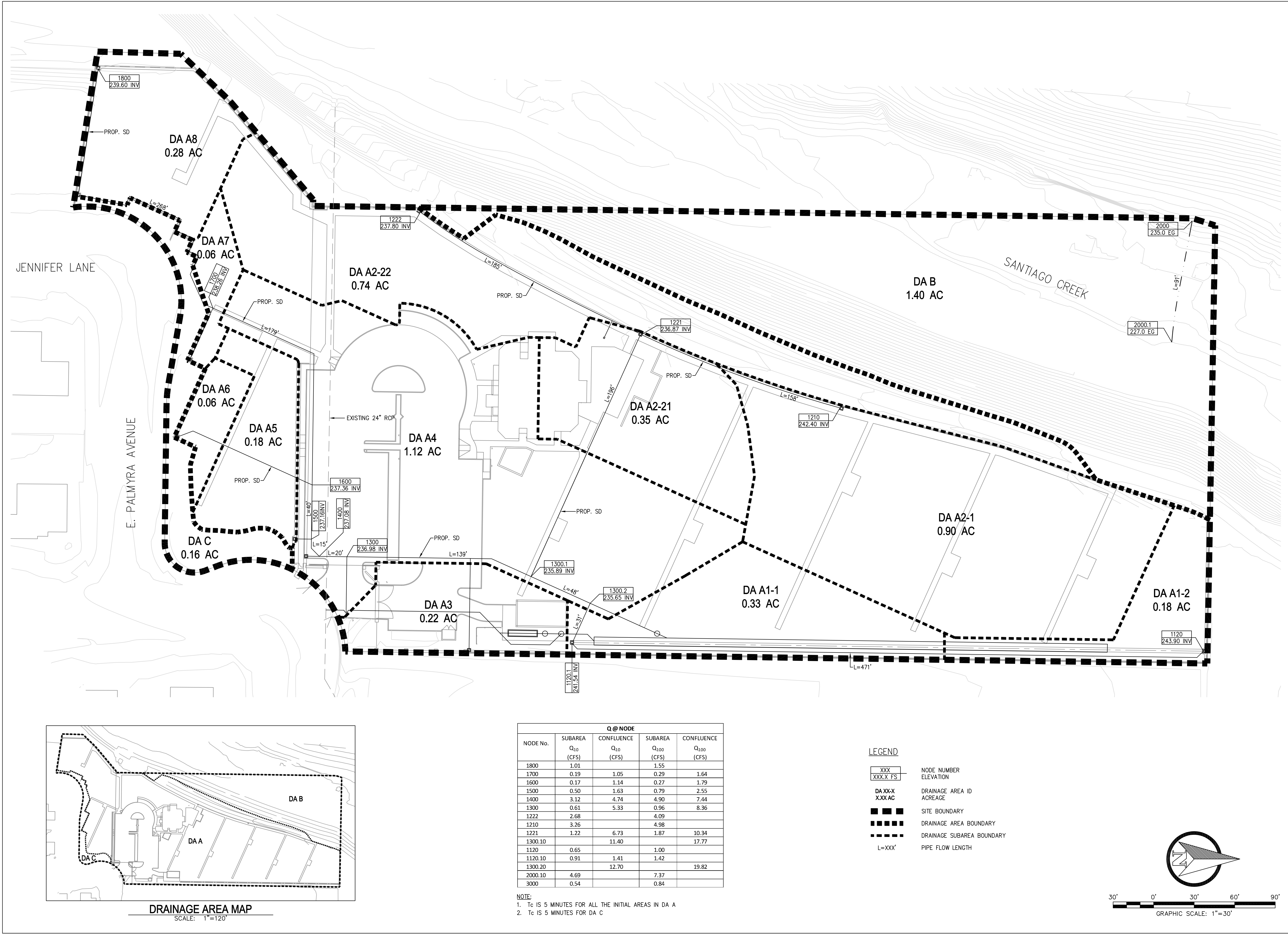
APPENDIX H

Existing Hydrology Map

Proposed Hydrology Map



NO.	REVISION:	DATE:



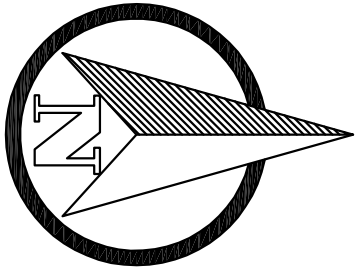
DRAINAGE AREA MAP
SCALE: 1"=120'

NODE No.	Q @ NODE			
	SUBAREA Q ₁₀ (CFS)	CONFLUENCE Q ₁₀ (CFS)	SUBAREA Q ₁₀₀ (CFS)	CONFLUENCE Q ₁₀₀ (CFS)
1800	1.01		1.55	
1700	0.19	1.05	0.29	1.64
1600	0.17	1.14	0.27	1.79
1500	0.50	1.63	0.79	2.55
1400	3.12	4.74	4.90	7.44
1300	0.61	5.33	0.96	8.36
1222	2.68		4.09	
1210	3.26		4.98	
1221	1.22	6.73	1.87	10.34
1300.10		11.40		17.77
1120	0.65		1.00	
1120.10	0.91	1.41	1.42	
1300.20		12.70		19.82
2000.10	4.69		7.37	
3000	0.54		0.84	

NOTE:
1. T_c IS 5 MINUTES FOR ALL THE INITIAL AREAS IN DA A
2. T_c IS 5 MINUTES FOR DA C

LEGEND

- XXX
XXX.X FS
- DA XX-X
XXX AC
- ■ ■
- ■ ■ ■ ■
-
- L=XXX'
- NODE NUMBER
ELEVATION
- DRAINAGE AREA ID
ACREAGE
- SITE BOUNDARY
- DRAINAGE AREA BOUNDARY
- DRAINAGE SUBAREA BOUNDARY
- PIPE FLOW LENGTH



PROJECT:

ISSUE: CONCEPTUAL

DATE: 2021-05-20

CHECKED: DRC DRAWN: DRC

DRAWING FILE: .

PROJECT NO.: 19-124

SHEET NUMBER: 1

OF 1 SHEETS

SCALE: AS SHOWN

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Anaheim Hills, CA 92808
714-685-6860

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning

GREGORY R. COOKE
R.C.E. 39478

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