Appendix L Pacific Oaks Commerce Center Hydrology Report

Appendices

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Preliminary Hydrology Report

Pacific Commerce Center

APNs: 0301-201-40 to 42, 0301-211-10, 0301-211-12, 0301-201-26, 0301-191-21

December 2022

PREPARED FOR:

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Certification by Engineer

_____

Jacob Glaze, P.E. Date

Contents

Appendices

References

Hydrology Manual. County of San Bernardino, August 1986.

100.0 Introduction

Kimley-Horn and Associates has been retained to prepare a Preliminary Hydrology Report for the proposed Pacific Commerce Center project in Yucaipa, California. The purpose of this report is to demonstrate preliminary analysis of the hydrologic and hydraulic conditions associated with the development of the project site. To do so, the following is the scope of this report:

- Discuss potential for hydromodification downstream of the site
- Discuss the pre-development discharge patterns and points
- Discuss the post-development discharge patterns and points
- Determine the pre-development flow rates for the 2-year and 100-year event
- Determine the pre-development volumes for the 2-year and 100-year event
- Determine the post-development unmitigated flow rates for the 2-year and 100-year event
- Determine the post-development volumes for the 2-year and 100-year event
- Analyze the required post-development onsite mitigation for up to the 100-year event
- Determine the design of the detention basin to ensure that the volume and flow rate requirements are met

Even though this report discusses stormwater, this report is not a Stormwater Pollution Prevention Plan (SWPPP), a Groundwater Study, a Geotechnical Report, nor a Water Quality Management Plan (WQMP). Each of these reports discuss separate aspects of stormwater. However, portions of the Geotechnical Report are utilized and referenced for the purpose of this report. Similarly, the stormwater mitigation requirements of the WQMP are considered for sizing the BMPs used for this project.

100.1 Project Description

The project site is located southwest of the intersection between Live Oak Canyon Road and the I-10 and is bounded by Live Oak Canyon Road to the West, an existing farm to the North, the I-10 to the East, and undeveloped land to the South. The entire project site measures approximately 323.99 acres and will be developed in phases. The project intends to develop the site into two new industrial complexes.

The existing project site is vacant, undeveloped land with poor coverage. The soils have a hydrologic soil group classification of "B", and the topography of the project site shows that runoff within the site primarily sheet flows towards the west and confluences into the Yucaipa Creek.

The proposed site is considered an industrial development and intends to develop approximately 323.99 acres into two industrial buildings, parking areas, loading docks, drive aisles, and landscape areas. Towards the western portion of the site will be an undeveloped parcel used to store excess cut from the development. Stormwater runoff within the disturbed areas will be collected by nearby catch basins and conveyed to a diversion structure that directs low flows into a hydrodynamic separator for pretreatment. Pretreated flows will then be routed into an Underground CMP Detention System where it will be temporarily detained and released at a mitigated flowrate towards a Modular Wetland System for treatment prior to discharging offsite. In the case of larger storm events, high flows will bypass the detention system and be diverted directly offsite through the diversion structure. Refer to the Post-Development Exhibit in Appendix G for more information.

Due to the surrounding area being largely undeveloped, the project site naturally receives offsite runon from the eastern area. To maintain existing drainage patterns, the project proposes to collect and route offsite drainage across the site through a storm drain placed along the proposed public road. Offsite runon entering the public storm drain will continue flowing west and ultimately outlet near the westerly property line without any treatment.

100.2 Methodology

100.2.1 Background

The type of soil and soil conditions are major factors affecting infiltration and storm water runoff as a result. The Natural Resources Conservation Service (NRCS) has classified soil into general hydrologic soil groups for comparing infiltration and runoff rates. Each group is based on properties that influence runoff, such as water infiltration rate, texture, natural discharge, and moisture condition. The runoff potential is based on the amount of runoff at the end of a long duration storm that occurs after wetting and swelling of the soil not protected by vegetation. Using the Soil Maps in the San Bernardino County Hydrology Manual, the hydrologic soil group classification for the area was determined to be B. Soil type B is defined as soils having a moderate infiltration rate when thoroughly wet.

A Geotechnical Study and Infiltration Testing has not yet been prepared. However, from a preliminary site analysis, the project site consists of steep slopes and shallow bedrock. Due to these factors, infiltration based BMPs will be infeasible for the project.

For the hydrologic analysis, the Rational Method, Unit Hydrograph Method, and Basin Routing Analysis were used to solve for the time of concentration, flow rates, and volumes following methodology described in the San Bernardino County Hydrology Manual, and the Advanced Engineering Software (AES) was used to compute the data. Utilizing precipitation data from NOAA Atlas 14 along with the proposed site characteristics, the rational method was used to compute the time of concentrations and peak flow rates generated from the existing and proposed 2-year and 100-year storm events. The time of concentration was then used to solve for the Unit Hydrograph of the site which returned the total volume generated for the 24-hour duration of the 2-year and 100-year storm events. The Unit Hydrograph is then routed through the basin to perform the Basin Routing Analysis which returns the peak flow out of the proposed underground basin along with the maximum water surface elevation for up to the 100-year storm.

Antecedent moisture conditions (AMC) I and III were used to calculate the peak flows and volumes for the 2-year and 100-year storm events respectively based on the hydrology manual. In addition, since the project is not located within a location that is HCOC Exempt, hydromodification will be a concern and calculations comparing the pre-development and post-development conditions for a 2-year storm event were performed.

100.2.2 Design Methodology

Due to infiltration being infeasible in the area, the project site will be unable to retain stormwater runoff onsite. Therefore, to mitigate adverse impacts downstream of the site, the project proposes to mitigate peak flow rates to be no greater than the existing flow rate for up to the 100-year storm event. In addition, the design capture volume (DCV), which contains pollutants from the first flush, will be treated by a Modular Wetland System prior to discharging offsite. For the 2-year storm event, the project will comply with hydromodification requirements and not exceed the pre-development flow rate by more than 5 percent. Refer to the WQMP for more information regarding the water quality requirements that the BMPs will comply with.

For hydraulic purposes, the storm drain system and inlets will be designed to be able to accommodate the design storm of a 100-year storm event, and calculations will be performed during Final Engineering.

100.2.3 Calculations Performed

Below is a summary of the calculations that were performed for hydrological and hydraulic analysis. Refer to Appendices H, I, and J for the Rational Method, Unit Hydrograph, and Basin Routing calculations respectively.

1. Rational Method
    a. 2-year storm event for pre-development and post-development conditions
    b. 100-year storm event for pre-development and post-development conditions
        i. Used to determine peak flows and time of concentration

2. Unit Hydrograph
    a. 2-year storm event for pre-development and post-development conditions
    b. 100-year storm event for pre-development and post-development conditions
        i. Used to determine volumes and generate the inflow hydrograph for the basin analysis

3. Basin Analysis
    a. 2-year, 100-year storm event
        i. Used to determine peak flows for each storm event
        ii. Used to determine max water surface elevation within the basin for the 100-year storm

100.3 Drainage Characteristics

The site is in Zones D, X, AO, and AE per the Federal Emergency Management Administration (FEMA) Flood Insurance Rate Maps (FIRM) map number 06071C8740H, dated August 28, 2008. For reference, see the FIRM Map in Appendix B.

Most of the project site is within Flood Zones X and D, which is defined by FEMA as areas determined to be outside the 0.2% annual chance floodplain and areas in which flood hazards are undetermined, but possible respectively. However, a portion of the project site near the channel is within a special flood hazard area subject to inundation by the 1% annual chance flood, and the project will ensure that the finish floor elevation of the building is at least one foot higher than the flood elevation.

100.3.1 Pre-development (Existing) Condition

Under the existing conditions, the project site primarily drains from east to west towards Yucaipa Creek. The existing project site is vacant, undeveloped land with poor coverage, and under existing conditions, the project site was subdivided into seven drainage management areas (A1 to A7). Runoff from all drainage management areas sheet flows towards the east and ultimately reach the Yucaipa Creek. See the Pre-Development Hydrology Exhibit in Appendix G for more information.

Table 1 shows a summary of the pre-development (existing) flows and volumes for the project site. See the Pre-Development Hydrology Exhibit in Appendix G for more information, Appendix H for the Rational Method Calculations, and Appendix I for the Unit Hydrograph Calculations.

Table 1: Pre-development (Existing) Flows and Volumes (Refer to Pre-Development Exhibit)

Area Description	Area (acres)	Q_2 (cfs)	V_2 (cf)	Q_{100} (cfs)	V_{100} (cf)
A1	10.89	8.59	8,943	37.40	178,683
A2	20.62	5.30	14,484	49.06	339,637
A3	26.66	17.45	21,658	92.52	437,103
A4	48.40	20.28	35,162	136.81	794,260
A5	85.66	1.79	49,449	146.21	1,412,951
A6	89.75	13.06	55,138	198.73	1,476,453
A7	42.02	20.46	33,123	125.45	690,544
Total	**323.99**	**86.93**	**217,957**	**786.18**	**5,329,631**

100.3.2 Post-development Condition

Runoff within the proposed development of the project site will be collected by nearby catch basins and conveyed to a diversion structure that directs low flows into a hydrodynamic separator for pretreatment. Pretreated flows will then be routed into an Underground CMP Detention System where it will be temporarily detained and released at a mitigated flowrate towards a Modular Wetland System for treatment prior to discharging offsite. In the case of larger storm events, high flows will bypass the detention system and be diverted directly offsite through the diversion structure. Refer to the Post-Development Exhibit in Appendix G for more information.

Table 2 shows a summary of the post-development flows (unmitigated). For more information, refer to the Post Development Hydrology Exhibit in Appendix G, the Rational Method Calculations in Appendix H, and the Unit Hydrograph Calculations in Appendix I.

Table 2: Onsite Post-development Flows (Unmitigated)

Area Description	Area (acres)	Q_2 (cfs)	V_2 (cf)	Q_{100} (cfs)	V_{100} (cf)
A1	55.00	66.39	314,277	182.01	921,542
A2	18.95	22.01	91,419	60.48	300,769
A3	57.97	72.17	336,484	197.53	977,434
A4	95.01	17.76	61,968	182.33	1,558,607
B	68.96	22.64	50,874	179.72	1,132,068
C	10.48	3.21	7,623	26.46	172,532
D	17.61	7.12	13,512	45.51	57,604
Total	**323.99**	**211.30**	**876,157**	**874.04**	**5,120,556**

100.4 Stormwater Mitigation

Since infiltration is infeasible, onsite retention of excess stormwater runoff will not be possible. Therefore, the project proposes to treat the pollutants within the DCV with a Modular Wetland System prior to discharging offsite. In addition, to mitigate peak flows to be within an allowable rate, the project proposes to temporarily detain runoff via an Underground Detention System. For a 2-year storm event, the project will be required to attenuate peak flow rates per hydromodification requirements, and for the 100-year storm event, the project will not discharge more than existing conditions for the 100-year storm event to prevent adverse impacts downstream of the project site.

The below tables show a summary of the required treatment and peak flow mitigation, a summary of the underground basin, and a summary of the basin routing analysis respectively. Refer to Appendix J for more information on the proposed BMP and the Basin Routing Analysis.

Table 3: Stormwater Mitigation Requirements

Area Description	Retention Treatment (CF)	2-Year Allowable Outflow (cfs)	100-Year Allowable Outflow (cfs)
A1	176,693	-	37.40
A2	47,782	-	49.06
A3	190,063	-	92.52
A4	-	-	136.81
B	-	-	146.21
C	-	-	198.73
D	-	-	125.45
Total	**414,538**	**97.50**	**786.18**

Table 4: Basin Volume Summary

Area Description	BMP	Total Storage (CF)
A1	Underground 144" CMP (600' x 72')	450,183
A2	Underground 144" CMP (300' x 42')	137,857
A3	Underground 144" CMP (600' x 87')	538,370
Total		1,126,410

Table 5: Basin Routing Analysis

Area Description	2-Year Allowable Flow Rate (CFS)	2-Year Peak Flow Rate (CFS)	100-Year Allowable Flow Rate (CFS)	100-Year Peak Flow Rate (CFS)
A1		3.66		40.55
A2		1.22		11.22
A3		3.53		38.84
A4		17.76		182.33
B		22.64		179.72
C		3.21		26.46
D		7.12		45.51
Total	**97.50**	**59.14**	**786.18**	**524.63**

To mitigate peak flows, the diversion structure diverting low flows to each underground basin will also serve as an outlet structure that contains an orifice/weir that restricts the high flows discharging offsite all at once. See the below table for a summary of the outlet control devices and the Post Development Exhibit in Appendix G for a detail of the diversion structure.

Table 6: Outlet Control Summary

Area Description	Outlet Control Devices
A1	12"x12" Orifice *(5.50' above the bottom of the backfill for the detention system)* 24"x24" Orifice *(7.00' above the bottom of the backfill for the detention system)*
A2	6"x6" Orifice *(5.00' above the bottom of the backfill for the detention system)* 12"x12" Orifice *(6.50' above the bottom of the backfill for the detention system)*
A3	12"x12" Orifice *(5.00' above the bottom of the backfill for the detention system)* 24"x24" Orifice *(7.00' above the bottom of the backfill for the detention system)*

100.5 Hydraulic Analysis

The calculated peak flows from the analyses discussed above will be used to size the onsite drainage devices such as the pipes and catch basins. Sizing calculations will be performed and included in the Final Hydrology Report to ensure that the drainage system can accommodate the 100-year storm.

100.6 Conclusion

In conclusion, the following was covered in this report:

- The potential for hydromodification downstream of the site was discussed
- The pre-development discharge patterns and points were analyzed
- The post-development discharge patterns and points were analyzed
- The pre-development flow rates for the 2-year and 100-year events were determined
- The pre-development volumes for the 2-year and 100-year events were determined
- The post-development unmitigated flows for the 2-year and 100-year events were determined
- The post-development volumes for the 2-year and 100-year events were determined
- The required stormwater mitigation was analyzed
- The infiltration/detention basin was designed to ensure that the volume and flow mitigation requirements are met

As discussed in the contents of this report, the development is not expected to cause a significant impact to downstream systems for storms up to the 100-year storm.

Appendix A

Vicinity Map


Vicinity Map
Live Oak Canyon Farm
Project Site
Google Earth
L-11
N
5000 ft

Appendix B

FIRM Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. This imagery was flown in 2005 and was produced with a 1-meter ground sample distance.

This map may reflect more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

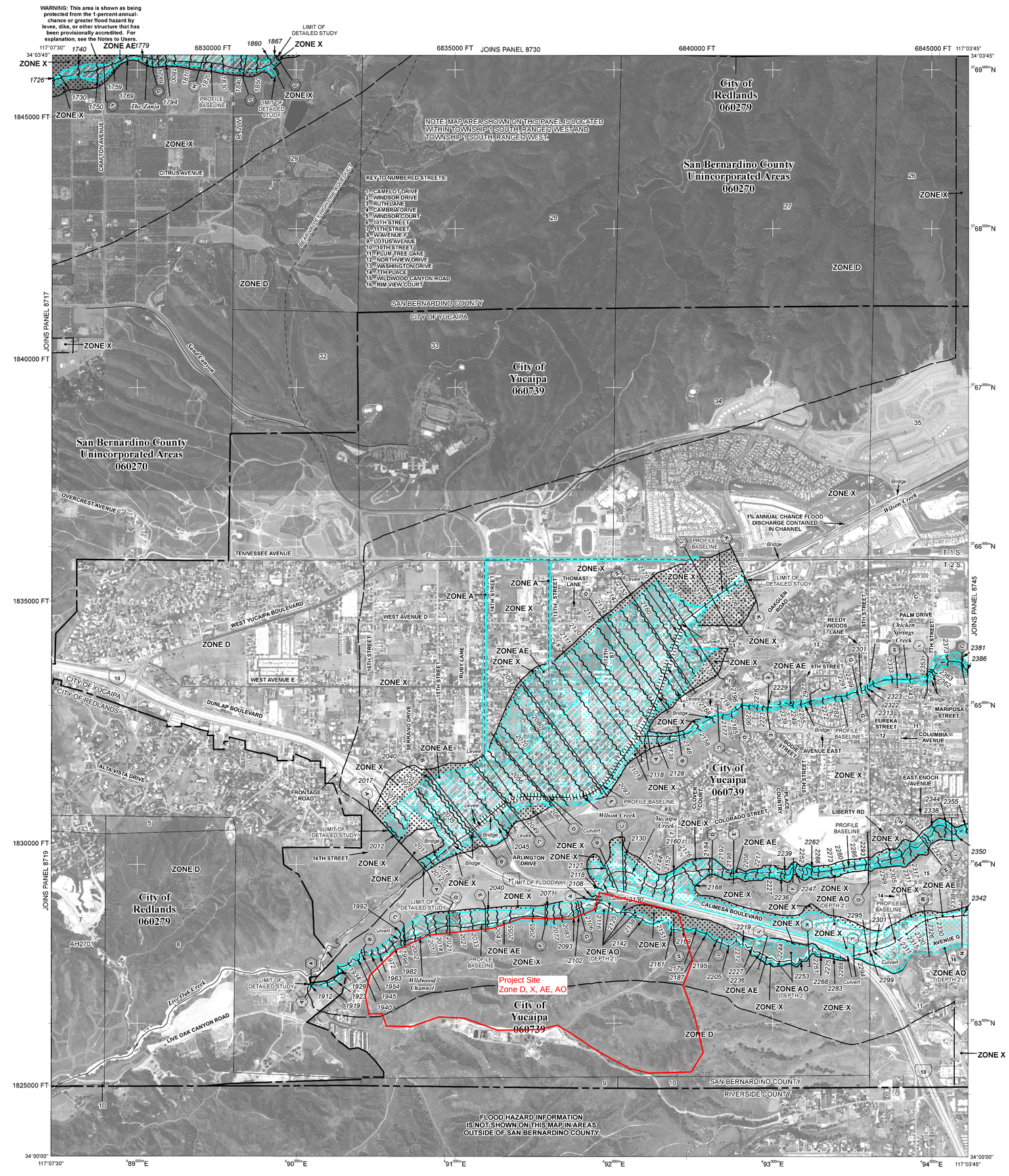
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

WARNING: A levee, dike, or other structure has been provisionally accredited and mapped as providing protection from the 1-percent–annual-chance or greater flood. The protected area is shown on the map with a warning note. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by August 8, 2009. Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- (A)—(A) — Cross section line
- (23)---(23) — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2676000 N — 1000-meter Universal Transverse Mercator grid values, zone 11N
- 600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
March 18, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 28, 2008 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

PANEL 8740H

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8740 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
REDLANDS, CITY OF	060279	8740	H
SAN BERNARDINO COUNTY	060270	8740	H
YUCAIPA, CITY OF	060739	8740	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06071C8740H

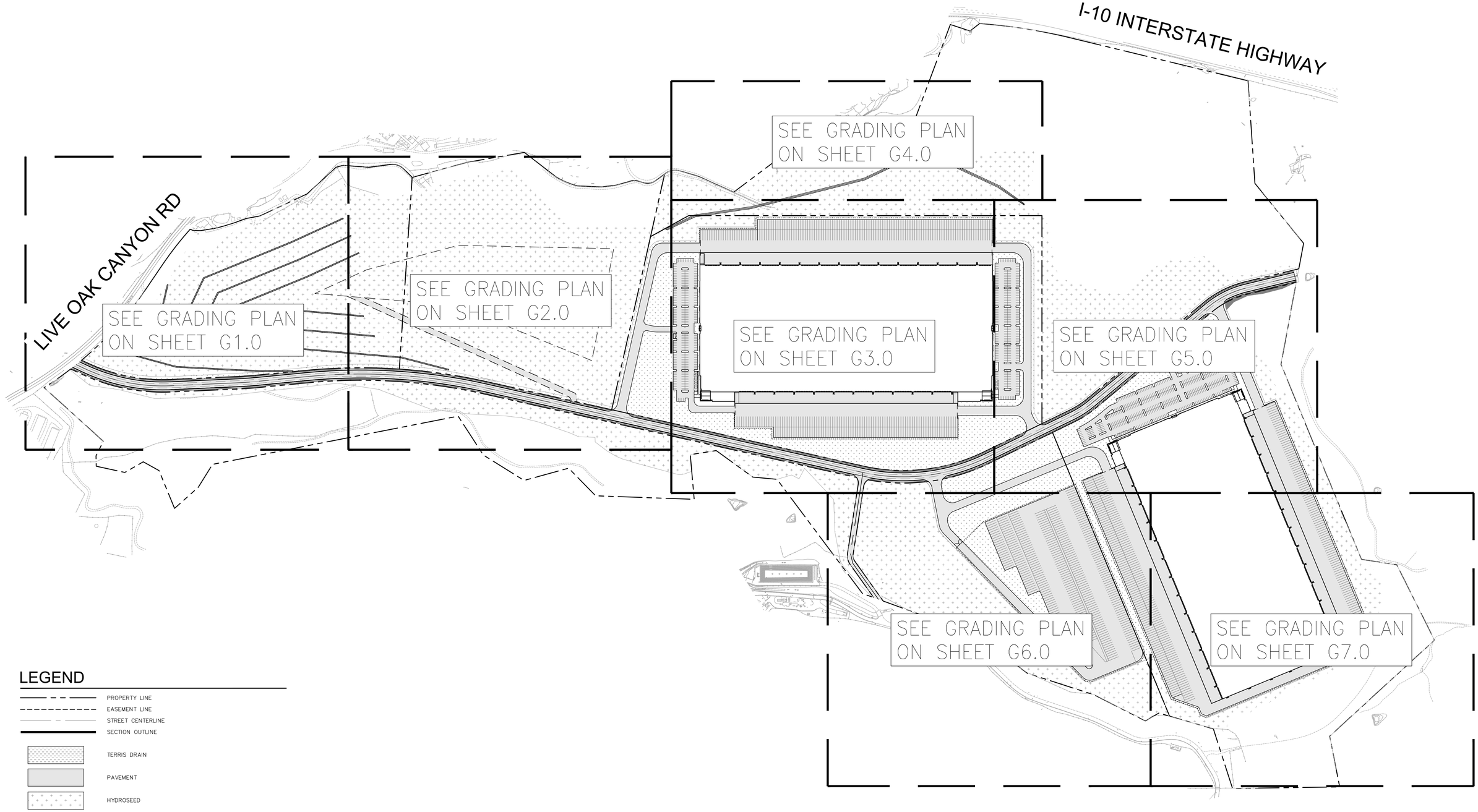
MAP REVISED
AUGUST 28, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

Appendix C

Construction Plans



LEGEND

- PROPERTY LINE
- EASEMENT LINE
- STREET CENTERLINE
- SECTION OUTLINE
- TERRIS DRAIN
- PAVEMENT
- HYDROSEED
- LANDSCAPING

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

SCALE: 1" = 200'
WHEN PRINTED AT FULL SIZE 30"X42"

RGA
Office of Architectural Design
15231 Alton Parkway,Suite 100
Irvine, CA 92618
T 949-341-0920
FX 949-341-0922

Kimley»Horn

PACIFIC OAKS COMMERCE CENTER

YUCAIPA, CA

CONCEPTUAL GRADING OVERALL PLAN

L-15

REGISTERED PROFESSIONAL ENGINEER JACOB S. GLATFELTER C 87934 CIVIL STATE OF CALIFORNIA

MARK	DATE	DESCRIPTION

RGA PROJECT NO:	20128.00
CAD FILE NAME:	----
DRAWN BY:	TA
CHK'D BY:	JR
COPYRIGHT: RGA, OFFICE OF ARCHITECTURAL DESIGN	
SHEET TITLE	
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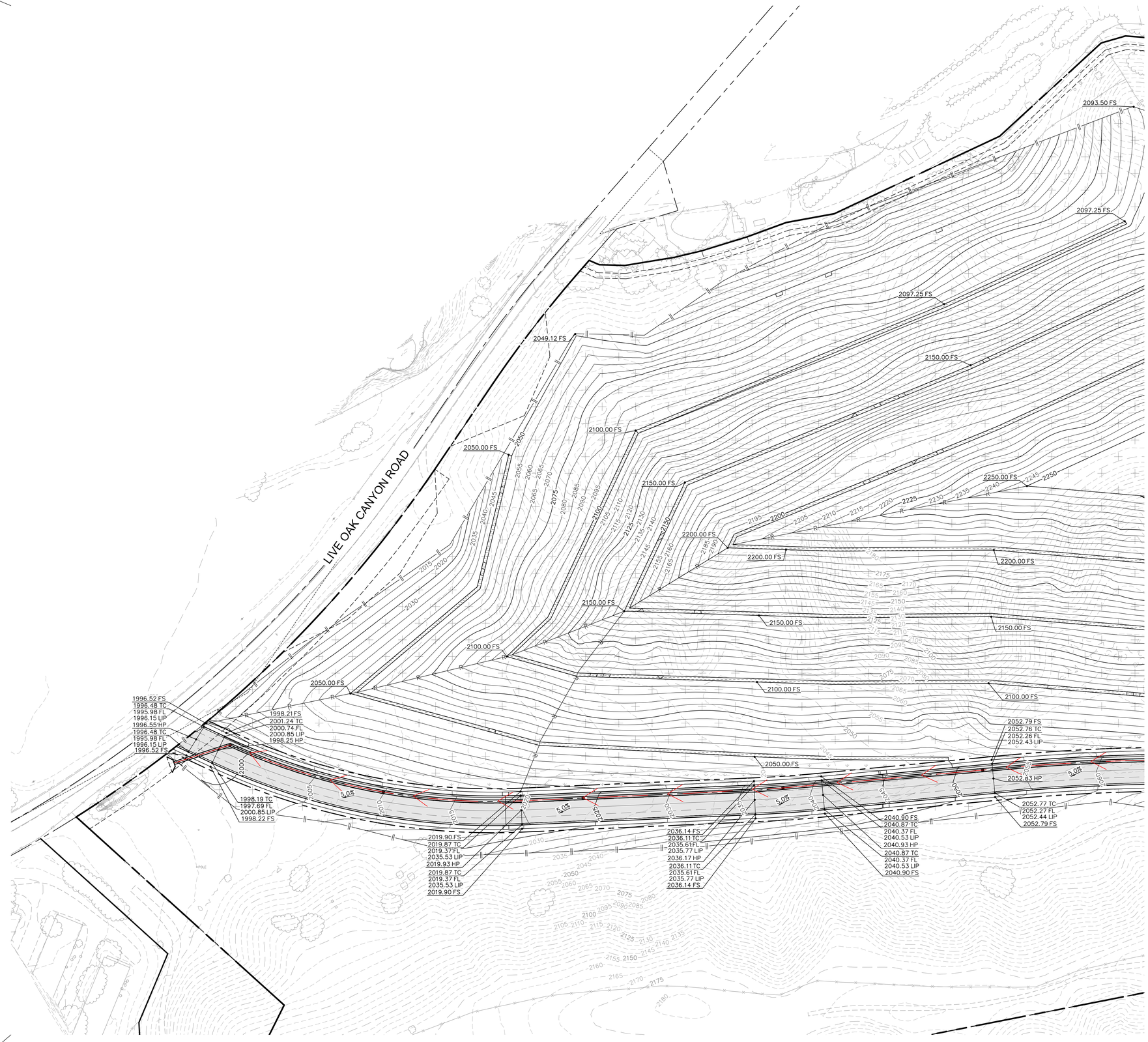

LEGEND

	PROPERTY LINE
	EASEMENT LINE
	STREET CENTERLINE
2166	PROPOSED CONTOURS
2166	EXISTING CONTOURS
GB	PROPOSED GRADE BREAK
R	PROPOSED RIDGE
	DAYLIGHT LINE
TR	TOP OF RAMP
TW	TOP OF WALL
TC	TOP OF CURB
FS	FINISHED SURFACE
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
HP	HIGH POINT
(2166.50 TC) (2166.00 FS)	EXISTING GRADE
2166.50 TC 2166.00 FS	PROPOSED GRADE
	TERRIS DRAIN
	PAVEMENT
	HYDROSEED
	LANDSCAPING
x.xx%	PROPOSED SLOPE

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

SCALE: 1" = 60'
WHEN PRINTED AT FULL SIZE 30"X42"

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Kimley»Horn

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PHONE: 714-939-1030
WWW.KIMLEY-HORN.COM

PACIFIC OAKS COMMERCE CENTER

YUCAIPA, CA

CONCEPTUAL GRADING AND DRAINAGE PLAN 1

REGISTERED PROFESSIONAL ENGINEER
JACOB S. CLARK
C 87934
CIVIL
STATE OF CALIFORNIA

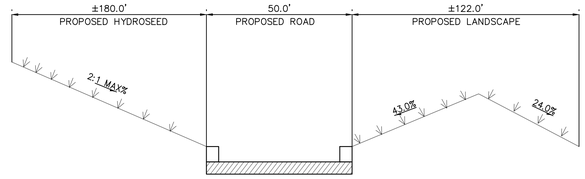
MARK	DATE	DESCRIPTION

RGA PROJECT NO:	20128.00
CAD FILE NAME:	----
DRAWN BY:	TA
CHK'D BY:	JR
COPYRIGHT: RGA, OFFICE OF ARCHITECTURAL DESIGN	
SHEET TITLE	

G1.0

LEGEND

	PROPERTY LINE
	EASEMENT LINE
	STREET CENTERLINE
2166	PROPOSED CONTOURS
2166	EXISTING CONTOURS
GB	PROPOSED GRADE BREAK
R	PROPOSED RIDGE
	DAYLIGHT LINE
TR	TOP OF RAMP
TW	TOP OF WALL
TC	TOP OF CURB
FS	FINISHED SURFACE
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
HP	HIGH POINT
(2166.50 TC) (2166.00 FS)	EXISTING GRADE
2166.50 TC 2166.00 FS	PROPOSED GRADE
	TERRIS DRAIN
	PAVEMENT
	HYDROSEED
	LANDSCAPING
x.x%	PROPOSED SLOPE



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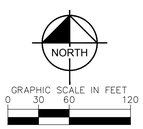

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PACIFIC OAKS COMMERCE CENTER

YUCAIPA, CA

CONCEPTUAL GRADING AND DRAINAGE PLAN 2

REGISTERED PROFESSIONAL ENGINEER
JASON S. GLEESE
C 87934
CIVIL
STATE OF CALIFORNIA

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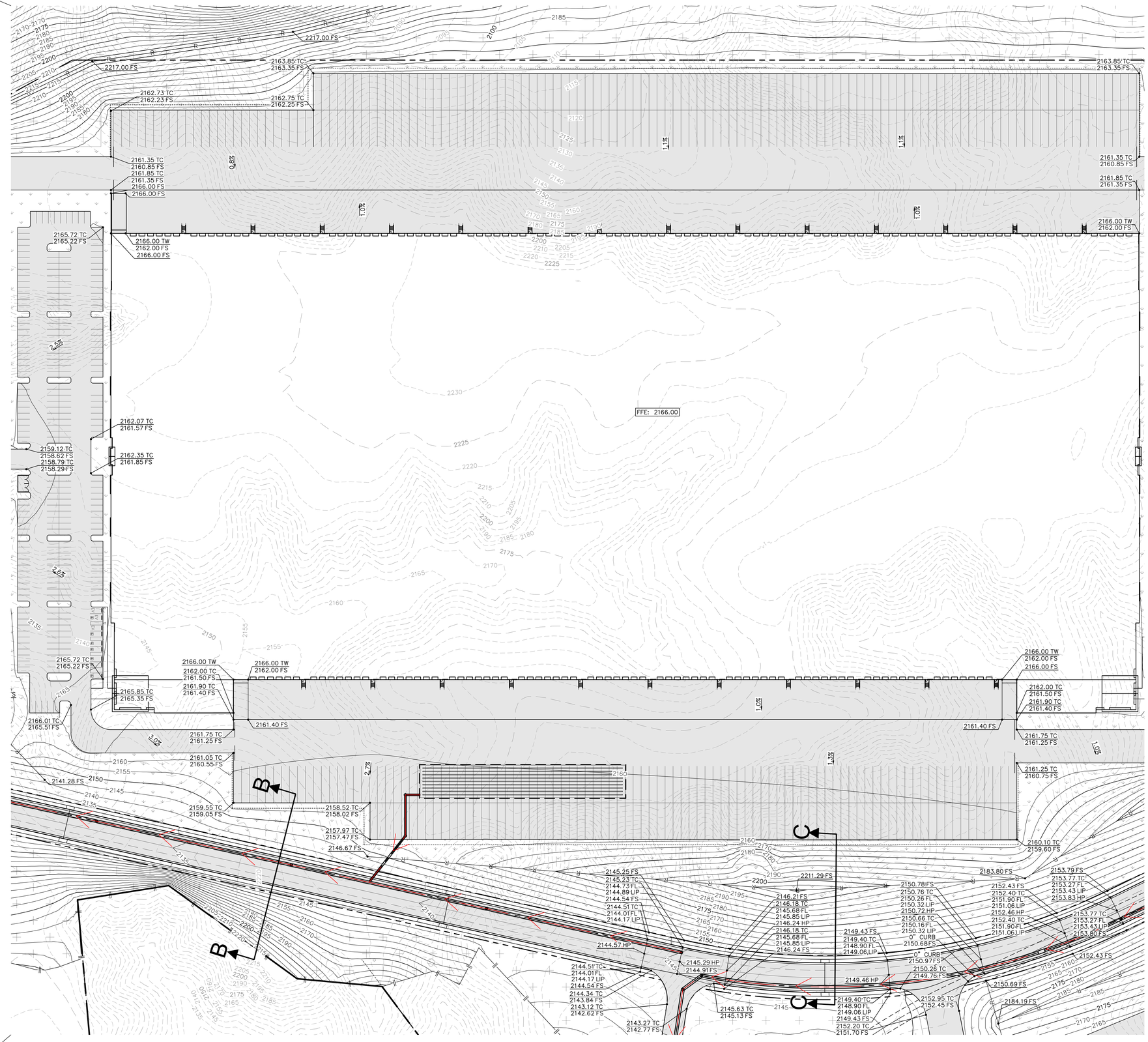
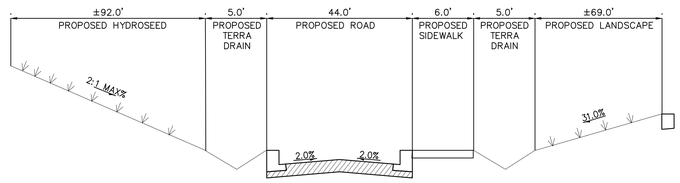


LEGEND

- PROPERTY LINE
- EASEMENT LINE
- STREET CENTERLINE
- 2166 — PROPOSED CONTOURS
- 2166 — EXISTING CONTOURS
- GB — PROPOSED GRADE BREAK
- R — PROPOSED RIDGE
- DAYLIGHT LINE
- TR — TOP OF RAMP
- TW — TOP OF WALL
- TC — TOP OF CURB
- FS — FINISHED SURFACE
- TS — TOP OF STAIRS
- BS — BOTTOM OF STAIRS
- HP — HIGH POINT
- (2166.50 TC) / (2166.00 FS) — EXISTING GRADE
- 2166.50 TC / 2166.00 FS — PROPOSED GRADE
- TERRIS DRAIN
- PAVEMENT
- HYDROSEED
- LANDSCAPING
- x.x% — PROPOSED SLOPE



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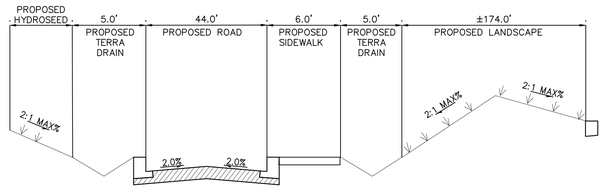

C-C SECTION

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NORTH

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PACIFIC OAKS COMMERCE CENTER

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CONCEPTUAL GRADING AND DRAINAGE PLAN 3

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER S. CLYNE — C 87934 — CIVIL — STATE OF CALIFORNIA

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LEGEND

	PROPERTY LINE
	EASEMENT LINE
	STREET CENTERLINE
2166	PROPOSED CONTOURS
2166	EXISTING CONTOURS
GB	PROPOSED GRADE BREAK
R	PROPOSED RIDGE
‖	DAYLIGHT LINE
TR	TOP OF RAMP
TW	TOP OF WALL
TC	TOP OF CURB
FS	FINISHED SURFACE
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
HP	HIGH POINT
(2166.50 TC) (2166.00 FS)	EXISTING GRADE
2166.50 TC 2166.00 FS	PROPOSED GRADE
	TERRIS DRAIN
	PAVEMENT
	HYDROSEED
	LANDSCAPING
x.x%	PROPOSED SLOPE

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

SCALE: 1" = 60'
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PACIFIC OAKS COMMERCE CENTER

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CONCEPTUAL GRADING AND DRAINAGE PLAN 4

REGISTERED PROFESSIONAL ENGINEER JASON S. GLATT C 87934 CIVIL STATE OF CALIFORNIA

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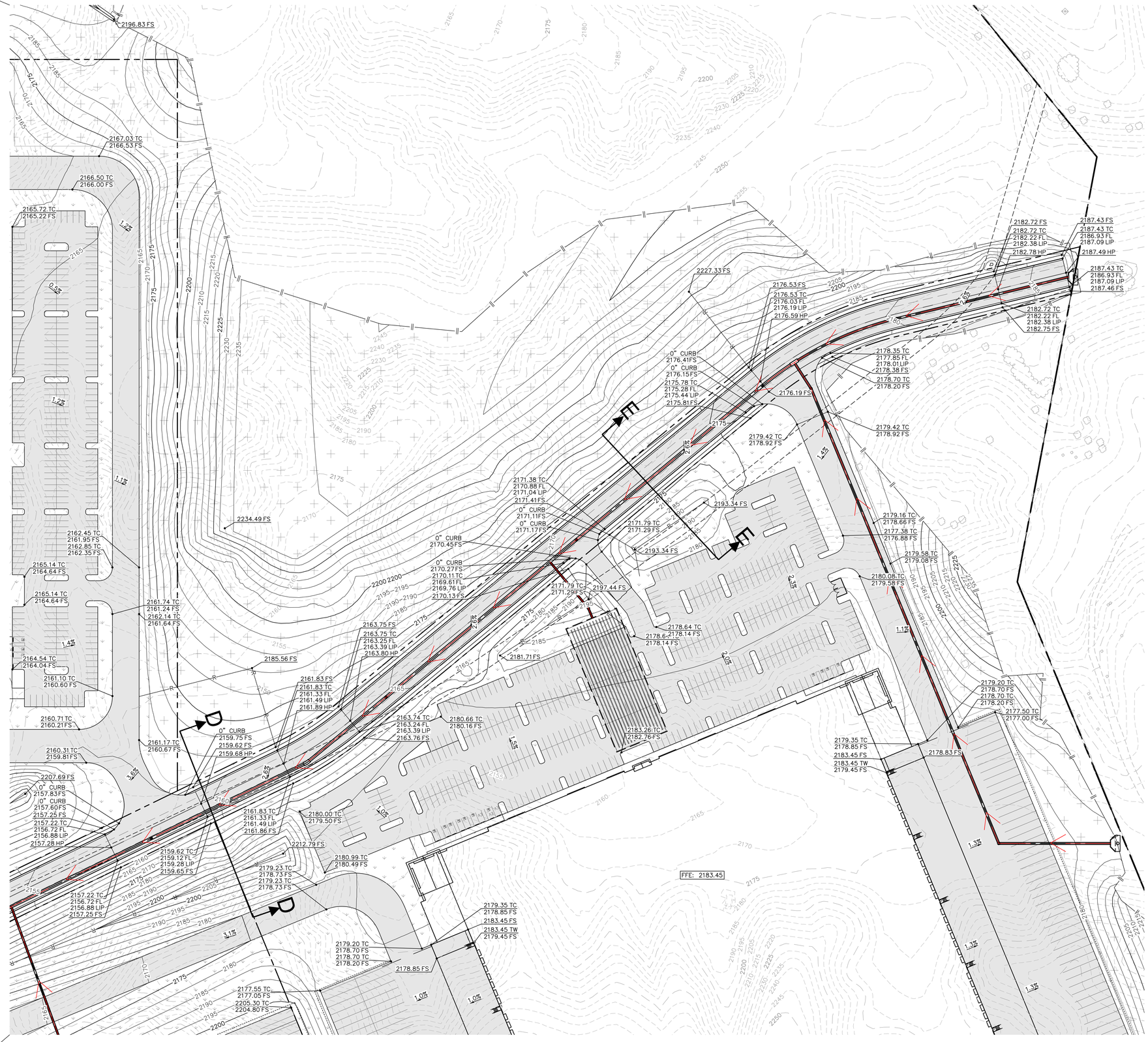
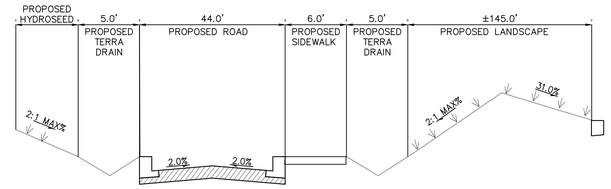


LEGEND

	PROPERTY LINE
	EASEMENT LINE
	STREET CENTERLINE
2166	PROPOSED CONTOURS
2166	EXISTING CONTOURS
GB	PROPOSED GRADE BREAK
R	PROPOSED RIDGE
	DAYLIGHT LINE
TR	TOP OF RAMP
TW	TOP OF WALL
TC	TOP OF CURB
FS	FINISHED SURFACE
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
HP	HIGH POINT
(2166.50 TC) (2166.00 FS)	EXISTING GRADE
2166.50 TC 2166.00 FS	PROPOSED GRADE
	TERRIS DRAIN
	PAVEMENT
	HYDROSEED
	LANDSCAPING
x.x%	PROPOSED SLOPE



D-D SECTION

NOT TO SCALE

E-E SECTION

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NORTH

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PACIFIC OAKS COMMERCE CENTER

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CONCEPTUAL GRADING AND DRAINAGE PLAN 5

REGISTERED PROFESSIONAL ENGINEER JASON S. GLEESE C 87934 CIVIL STATE OF CALIFORNIA

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SHEET TITLE	

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LEGEND

	PROPERTY LINE
	EASEMENT LINE
	STREET CENTERLINE
2166	PROPOSED CONTOURS
2166	EXISTING CONTOURS
GB	PROPOSED GRADE BREAK
R	PROPOSED RIDGE
	DAYLIGHT LINE
TR	TOP OF RAMP
TW	TOP OF WALL
TC	TOP OF CURB
FS	FINISHED SURFACE
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
HP	HIGH POINT
(2166.50 TC) (2166.00 FS)	EXISTING GRADE
2166.50 TC 2166.00 FS	PROPOSED GRADE
	TERRIS DRAIN
	PAVEMENT
	HYDROSEED
	LANDSCAPING
x.x%	PROPOSED SLOPE

NORTH

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SCALE: 1" = 60'
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CONCEPTUAL GRADING AND DRAINAGE PLAN 6

REGISTERED PROFESSIONAL ENGINEER
JACOB S. GLATFELTER
C 87934
CIVIL
STATE OF CALIFORNIA

MARK	DATE	DESCRIPTION

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SHEET TITLE	
G6.0	

LEGEND

	PROPERTY LINE
	EASEMENT LINE
	STREET CENTERLINE
2166	PROPOSED CONTOURS
2166	EXISTING CONTOURS
GB	PROPOSED GRADE BREAK
R	PROPOSED RIDGE
	DAYLIGHT LINE
TR	TOP OF RAMP
TW	TOP OF WALL
TC	TOP OF CURB
FS	FINISHED SURFACE
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
HP	HIGH POINT
(2166.50 TC) (2166.00 FS)	EXISTING GRADE
2166.50 TC 2166.00 FS	PROPOSED GRADE
	TERRIS DRAIN
	PAVEMENT
	HYDROSEED
	LANDSCAPING
x.x%	PROPOSED SLOPE

NORTH

GRAPHIC SCALE IN FEET
0 ## ## ##

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CONCEPTUAL GRADING AND DRAINAGE PLAN 7

L-22

REGISTERED PROFESSIONAL ENGINEER JACOB S. DATE C 87934 CIVIL STATE OF CALIFORNIA

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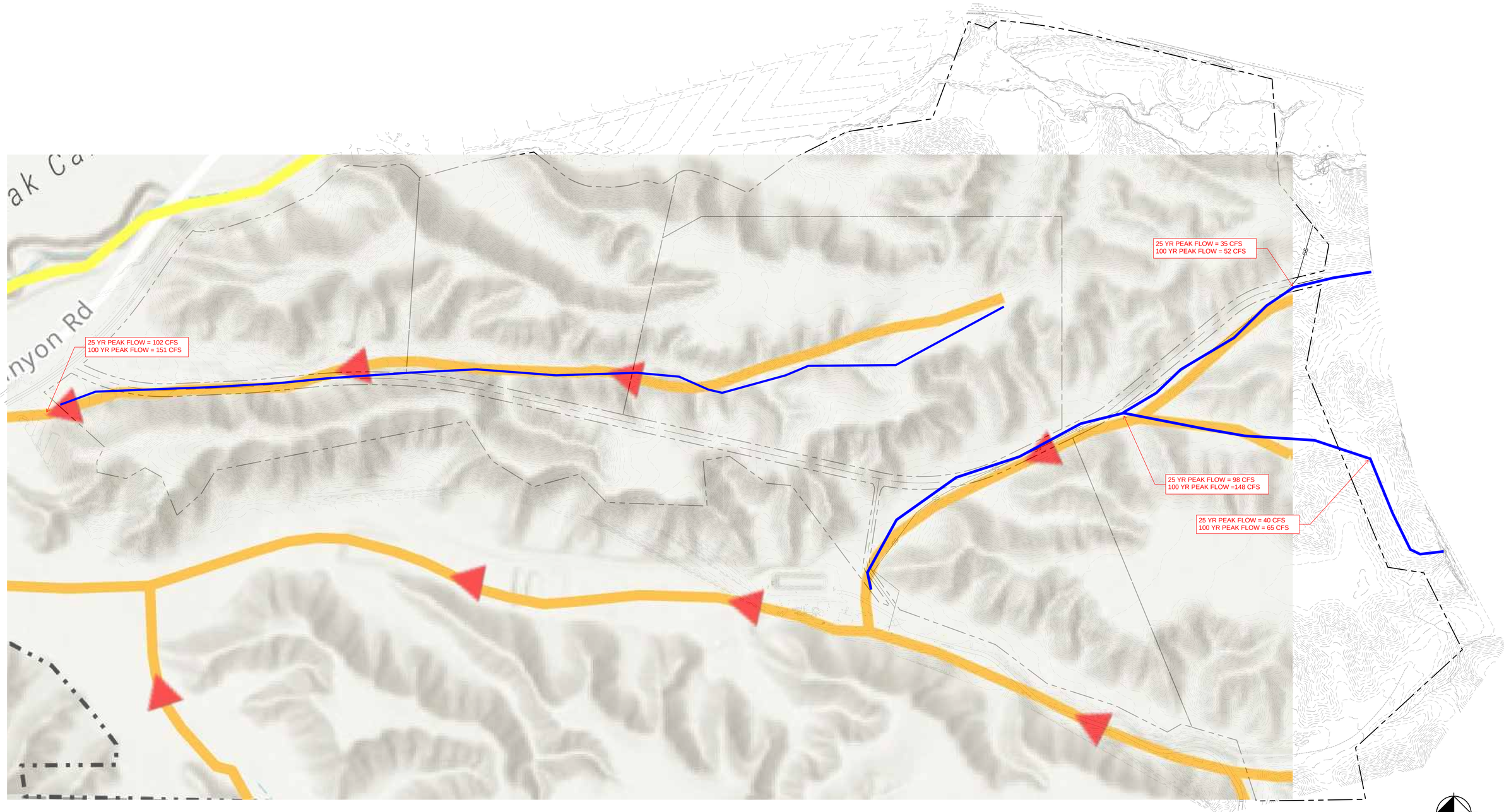
Appendix D

Hydrology Manual and Other Reference Material

OFFSITE RUNON ANALYSIS



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Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. All curve numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (2 of 2)

Appendix E

NOAA Rainfall Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Yucaipa, California, USA*
Latitude: 34.0089°, Longitude: -117.0858°
Elevation: 2157.18 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.107 (0.089-0.130)	0.139 (0.115-0.169)	0.182 (0.151-0.221)	0.218 (0.180-0.268)	0.271 (0.215-0.345)	0.314 (0.244-0.408)	0.360 (0.273-0.479)	0.410 (0.302-0.562)	0.483 (0.341-0.691)	0.544 (0.371-0.806)
10-min	0.154 (0.128-0.187)	0.199 (0.165-0.242)	0.261 (0.216-0.317)	0.313 (0.257-0.385)	0.389 (0.309-0.494)	0.450 (0.350-0.585)	0.516 (0.391-0.687)	0.588 (0.433-0.806)	0.693 (0.489-0.990)	0.780 (0.532-1.16)
15-min	0.186 (0.155-0.226)	0.240 (0.200-0.292)	0.315 (0.261-0.384)	0.379 (0.311-0.465)	0.470 (0.373-0.597)	0.544 (0.423-0.707)	0.624 (0.473-0.831)	0.711 (0.524-0.975)	0.837 (0.591-1.20)	0.943 (0.643-1.40)
30-min	0.278 (0.231-0.337)	0.359 (0.298-0.436)	0.470 (0.390-0.572)	0.565 (0.465-0.694)	0.701 (0.557-0.891)	0.812 (0.632-1.06)	0.931 (0.706-1.24)	1.06 (0.782-1.45)	1.25 (0.882-1.79)	1.41 (0.959-2.09)
60-min	0.404 (0.336-0.490)	0.521 (0.434-0.633)	0.683 (0.566-0.832)	0.821 (0.675-1.01)	1.02 (0.809-1.29)	1.18 (0.917-1.53)	1.35 (1.03-1.80)	1.54 (1.14-2.11)	1.82 (1.28-2.60)	2.04 (1.39-3.03)
2-hr	0.583 (0.486-0.708)	0.747 (0.621-0.907)	0.968 (0.803-1.18)	1.15 (0.949-1.42)	1.42 (1.13-1.80)	1.63 (1.26-2.11)	1.85 (1.40-2.46)	2.08 (1.54-2.86)	2.42 (1.71-3.46)	2.69 (1.83-3.99)
3-hr	0.725 (0.603-0.879)	0.924 (0.768-1.12)	1.19 (0.989-1.45)	1.42 (1.17-1.74)	1.73 (1.38-2.20)	1.98 (1.54-2.57)	2.24 (1.70-2.99)	2.52 (1.86-3.45)	2.90 (2.05-4.15)	3.21 (2.19-4.76)
6-hr	1.05 (0.870-1.27)	1.33 (1.11-1.61)	1.71 (1.42-2.08)	2.02 (1.66-2.48)	2.46 (1.95-3.12)	2.80 (2.18-3.64)	3.15 (2.39-4.20)	3.52 (2.60-4.83)	4.03 (2.85-5.77)	4.44 (3.03-6.58)
12-hr	1.41 (1.18-1.71)	1.80 (1.50-2.19)	2.32 (1.93-2.83)	2.75 (2.26-3.38)	3.33 (2.65-4.24)	3.79 (2.95-4.92)	4.25 (3.23-5.66)	4.73 (3.49-6.49)	5.40 (3.81-7.72)	5.91 (4.03-8.76)
24-hr	1.89 (1.68-2.18)	2.44 (2.16-2.82)	3.17 (2.79-3.66)	3.76 (3.29-4.38)	4.57 (3.87-5.50)	5.19 (4.31-6.38)	5.83 (4.72-7.34)	6.49 (5.12-8.40)	7.39 (5.59-9.95)	8.09 (5.92-11.3)
2-day	2.31 (2.04-2.66)	3.02 (2.67-3.49)	3.98 (3.51-4.60)	4.77 (4.18-5.57)	5.87 (4.97-7.08)	6.74 (5.59-8.29)	7.64 (6.19-9.62)	8.57 (6.76-11.1)	9.88 (7.48-13.3)	10.9 (7.99-15.2)
3-day	2.47 (2.18-2.84)	3.28 (2.90-3.78)	4.38 (3.86-5.07)	5.31 (4.64-6.19)	6.62 (5.61-7.98)	7.68 (6.37-9.44)	8.78 (7.11-11.1)	9.96 (7.85-12.9)	11.6 (8.80-15.7)	13.0 (9.49-18.1)
4-day	2.67 (2.36-3.07)	3.57 (3.16-4.12)	4.80 (4.24-5.56)	5.86 (5.12-6.83)	7.35 (6.23-8.85)	8.55 (7.10-10.5)	9.83 (7.96-12.4)	11.2 (8.82-14.5)	13.1 (9.94-17.7)	14.7 (10.8-20.5)
7-day	3.06 (2.71-3.53)	4.12 (3.64-4.75)	5.56 (4.90-6.43)	6.78 (5.93-7.90)	8.51 (7.21-10.2)	9.90 (8.21-12.2)	11.4 (9.20-14.3)	12.9 (10.2-16.7)	15.1 (11.5-20.4)	16.9 (12.4-23.6)
10-day	3.33 (2.95-3.84)	4.48 (3.96-5.17)	6.06 (5.35-7.01)	7.40 (6.47-8.63)	9.29 (7.87-11.2)	10.8 (8.96-13.3)	12.4 (10.0-15.6)	14.1 (11.1-18.2)	16.5 (12.5-22.2)	18.4 (13.5-25.7)
20-day	4.11 (3.64-4.74)	5.58 (4.93-6.44)	7.58 (6.68-8.77)	9.27 (8.11-10.8)	11.7 (9.87-14.0)	13.6 (11.3-16.7)	15.6 (12.6-19.6)	17.7 (14.0-22.9)	20.7 (15.7-27.9)	23.1 (16.9-32.2)
30-day	4.89 (4.33-5.63)	6.64 (5.87-7.66)	9.03 (7.96-10.4)	11.0 (9.66-12.9)	13.9 (11.8-16.7)	16.2 (13.4-19.9)	18.6 (15.1-23.4)	21.1 (16.7-27.3)	24.7 (18.7-33.3)	27.6 (20.2-38.4)
45-day	5.86 (5.19-6.75)	7.94 (7.02-9.17)	10.8 (9.51-12.5)	13.2 (11.5-15.4)	16.6 (14.1-20.0)	19.3 (16.0-23.8)	22.2 (18.0-27.9)	25.2 (19.9-32.6)	29.5 (22.3-39.7)	32.9 (24.1-45.9)
60-day	6.83 (6.05-7.87)	9.21 (8.15-10.6)	12.5 (11.0-14.4)	15.2 (13.3-17.8)	19.1 (16.2-23.1)	22.3 (18.5-27.4)	25.5 (20.7-32.2)	29.0 (22.9-37.6)	33.9 (25.7-45.7)	37.9 (27.7-52.8)

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

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

Please refer to NOAA Atlas 14 document for more information.

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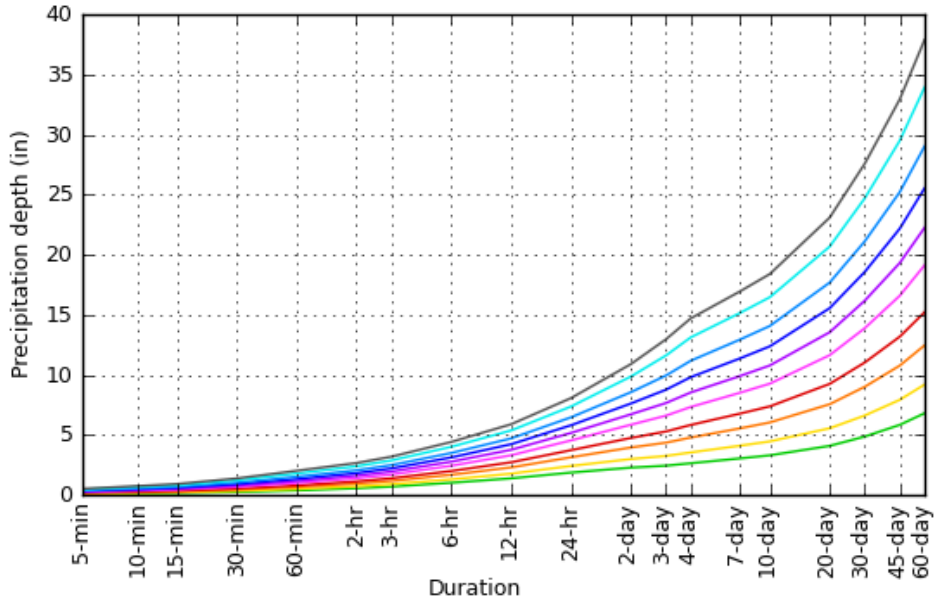
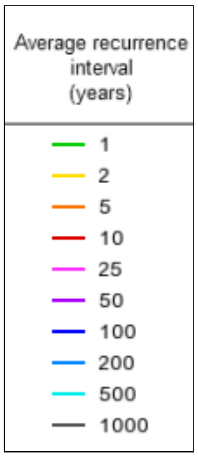
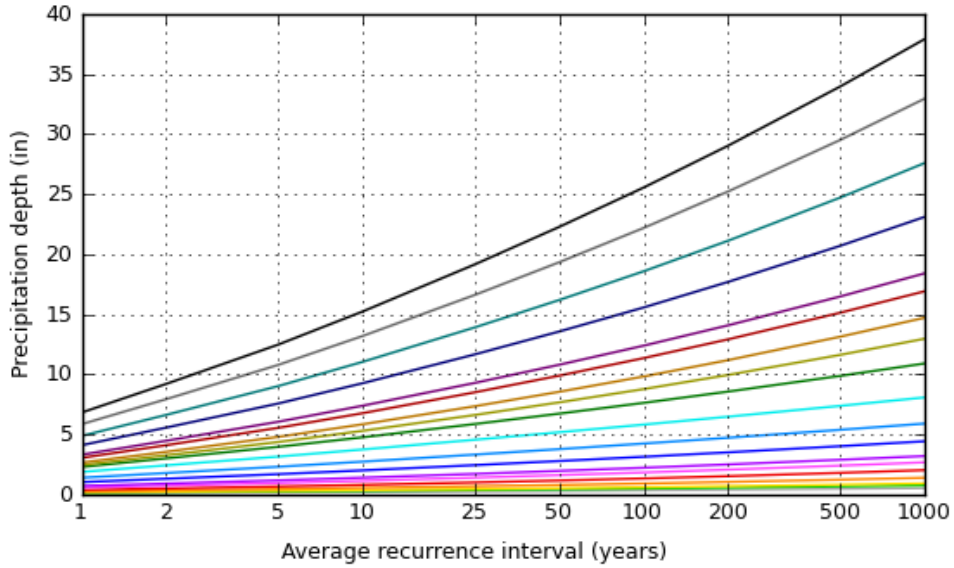
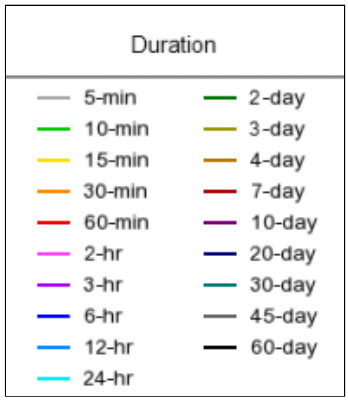
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 34.0089°, Longitude: -117.0858°









NOAA Atlas 14, Volume 6, Version 2 Created (GMT): Tue Dec 20 18:16:16 2022

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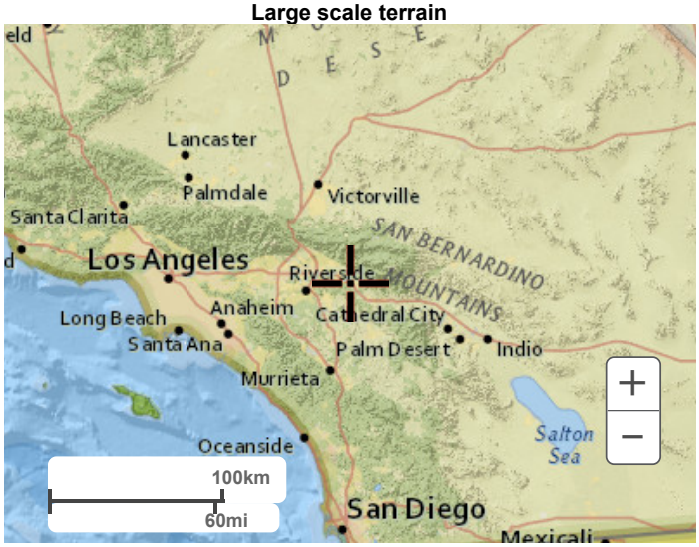
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map

Large scale aerial

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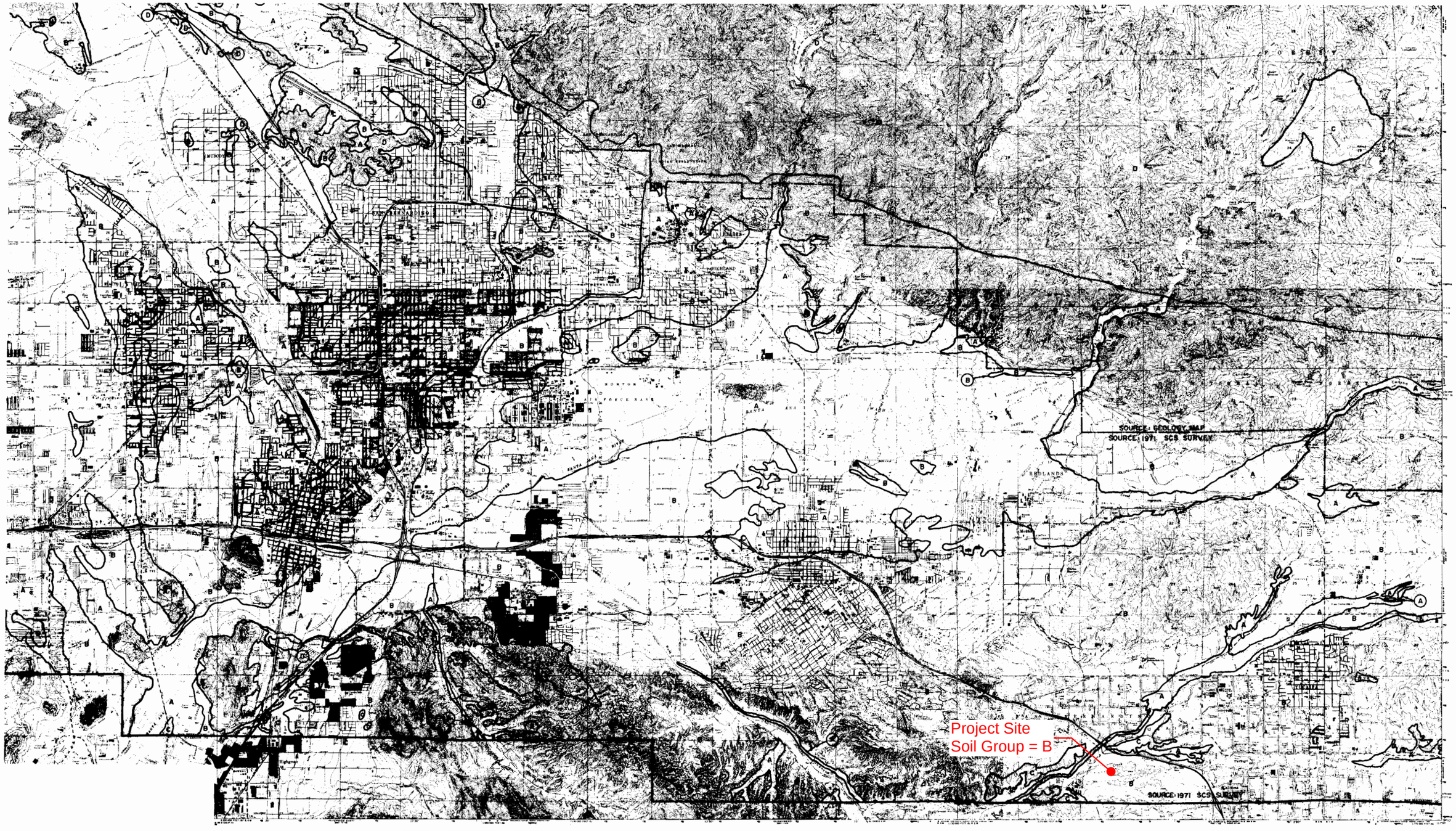
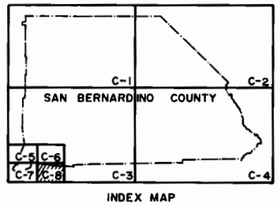
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix F

Soils Reports
(To be prepared in Final Engineering)





INDEX MAP

LEGEND

SOIL GROUP BOUNDARY

A SOIL GROUP DESIGNATION

BOUNDARY OF INDICATED SOURCE

SCALE 1:48,000

SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-D AREA

Appendix G

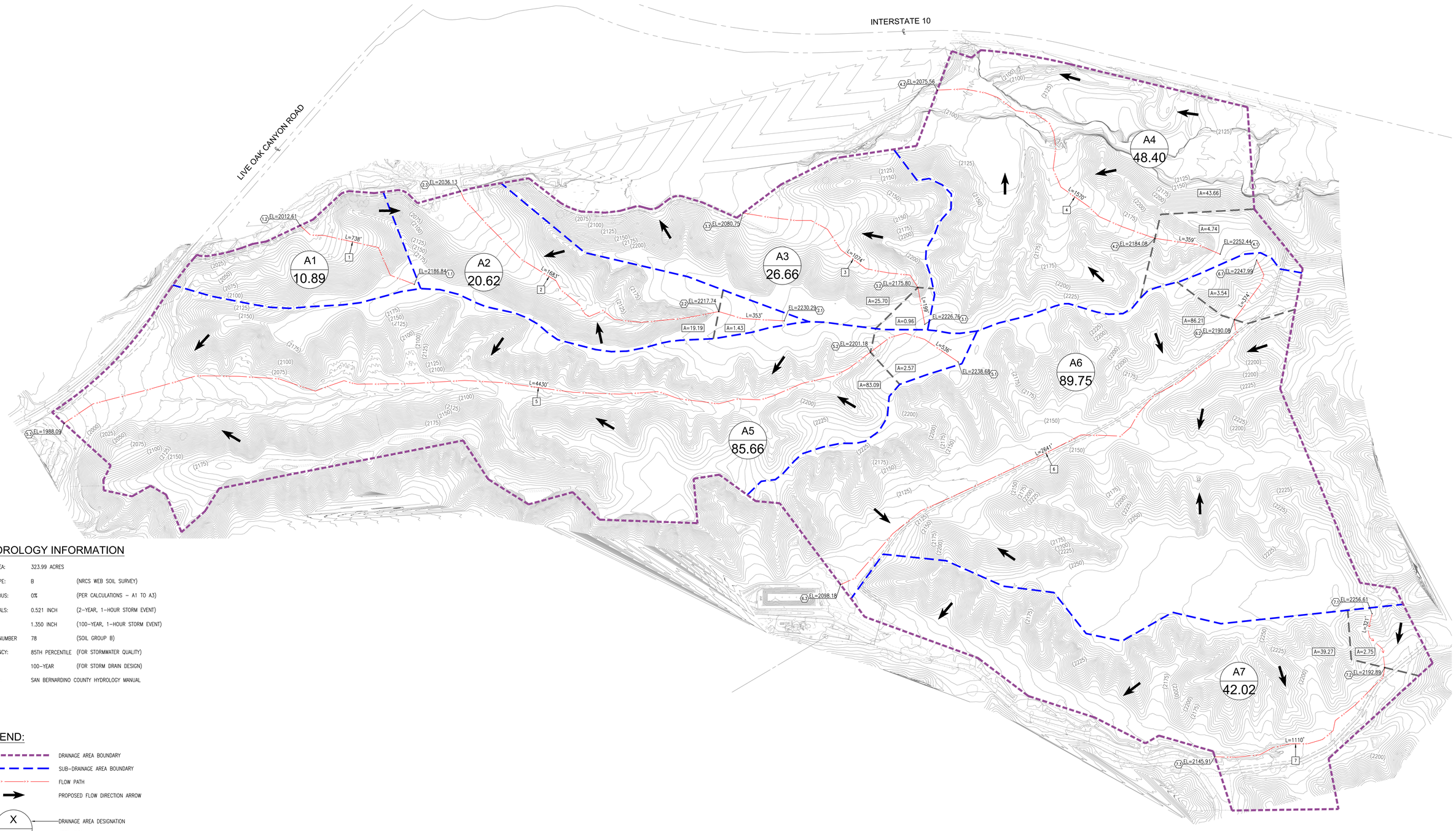
Hydrology Exhibits

CITY OF YUCAIPA

PRE-DEVELOPMENT HYDROLOGY EXHIBIT

FOR

PACIFIC COMMERCE CENTER



HYDROLOGY INFORMATION

SITE AREA:	323.99 ACRES	
SOIL TYPE:	B	(NRCS WEB SOIL SURVEY)
IMPERVIOUS:	0%	(PER CALCULATIONS – A1 TO A3)
ISOHYETALS:	0.521 INCH	(2–YEAR, 1–HOUR STORM EVENT)
	1.350 INCH	(100–YEAR, 1–HOUR STORM EVENT)
CURVE NUMBER	78	(SOIL GROUP B)
FREQUENCY:	85TH PERCENTILE	(FOR STORMWATER QUALITY)
	100–YEAR	(FOR STORM DRAIN DESIGN)
METHOD:	SAN BERNARDINO COUNTY HYDROLOGY MANUAL	

LEGEND:

- DRAINAGE AREA BOUNDARY
- SUB–DRAINAGE AREA BOUNDARY
- FLOW PATH
- PROPOSED FLOW DIRECTION ARROW
- X / X.XX — DRAINAGE AREA DESIGNATION / AREA (AC)
- A=X.XX — SUB–DRAINAGE AREA (AC)
- 1 — STREAM #
- 1.1 — NODE

HYDROLOGY SUMMARY

DRAINAGE AREA NO.	TRIBUTARY AREA (SF)	TRIBUTARY AREA (AC)	IMPERVIOUS RATIO	Q_2 (CFS)	V_2 (CF)	Q_{100} (CFS)	V_{100} (CF)
A1	474,231	10.89	0.00	8.59	8,943	37.40	178,683
A2	898,261	20.62	0.00	5.30	14,484	49.06	339,637
A3	1,161,199	26.66	0.00	17.45	21,658	92.52	437,103
A4	2,108,245	48.40	0.00	20.28	35,162	136.81	794,260
A5	3,731,265	85.66	0.00	1.79	49,449	146.21	1,412,951
A6	3,909,321	89.75	0.00	13.06	55,138	198.73	1,476,453
A7	1,830,544	42.02	0.00	20.46	33,123	125.45	690,544
TOTAL	14,113,066	323.99	0.00	86.93	217,957	786.18	5,329,631

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

PREPARED BY:
Kimley»Horn

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WWW.KIMLEY–HORN.COM

PACIFIC COMMERCE CENTER
PRE-DEVELOPMENT HYDROLOGY EXHIBIT
LIVE OAK CANYON ROAD

CITY OF YUCAIPA

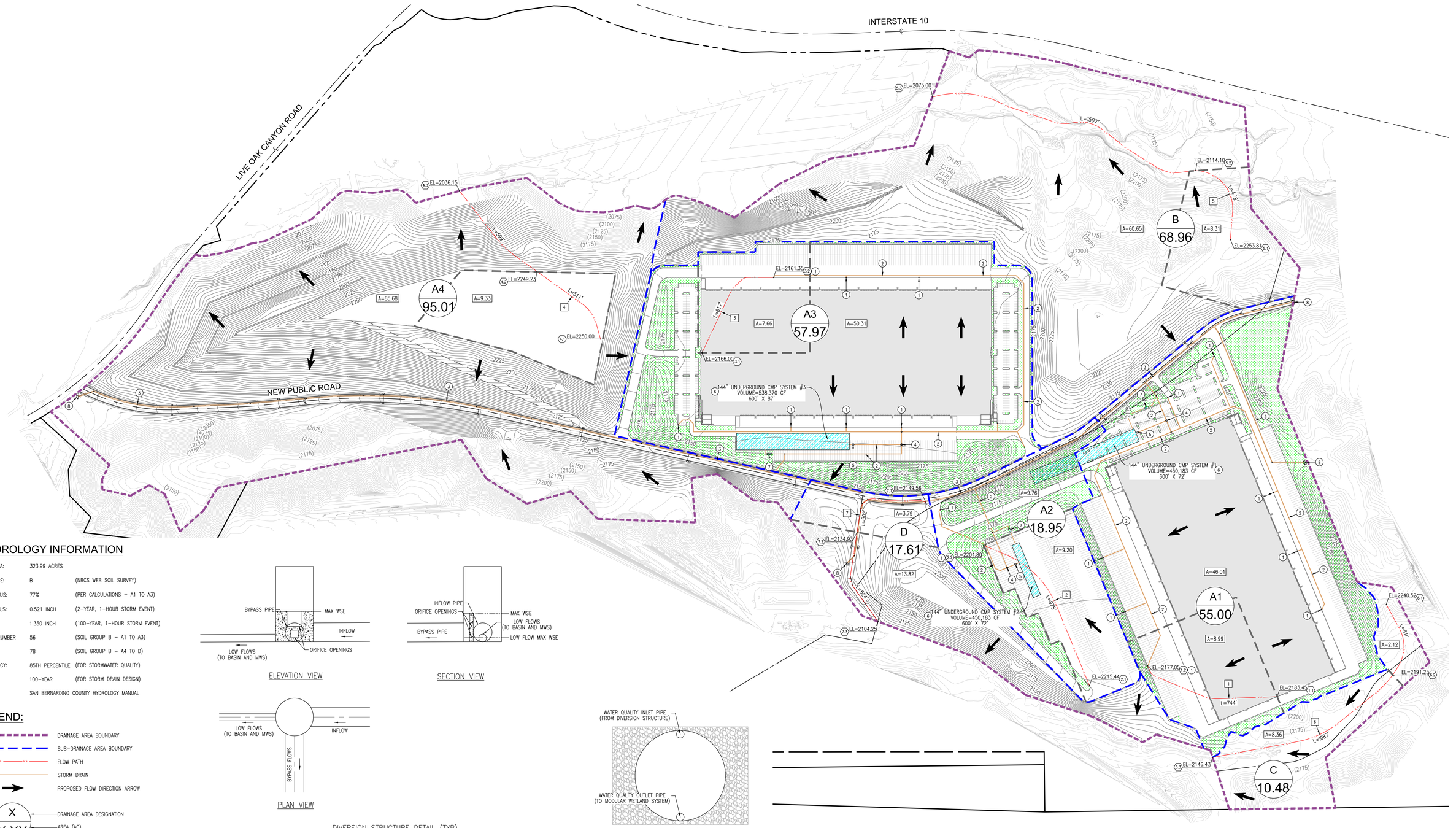
DATE: DEC 2022
SHEET 1 OF 1

CITY OF YUCAIPA

POST-DEVELOPMENT HYDROLOGY EXHIBIT

FOR

PACIFIC COMMERCE CENTER



HYDROLOGY INFORMATION

SITE AREA:	323.99 ACRES	
SOIL TYPE:	B	(NRCS WEB SOIL SURVEY)
IMPERVIOUS:	77%	(PER CALCULATIONS – A1 TO A3)
ISOHYETALS:	0.521 INCH	(2–YEAR, 1–HOUR STORM EVENT)
	1.350 INCH	(100–YEAR, 1–HOUR STORM EVENT)
CURVE NUMBER	56	(SOIL GROUP B – A1 TO A3)
	78	(SOIL GROUP B – A4 TO D)
FREQUENCY:	85TH PERCENTILE	(FOR STORMWATER QUALITY)
	100–YEAR	(FOR STORM DRAIN DESIGN)
METHOD:	SAN BERNARDINO COUNTY HYDROLOGY MANUAL	

ELEVATION VIEW

SECTION VIEW

PLAN VIEW

DIVERSION STRUCTURE DETAIL (TYP)

NTS

CHAMBER SECTION

NTS

LEGEND:

- DRAINAGE AREA BOUNDARY
- SUB–DRAINAGE AREA BOUNDARY
- FLOW PATH
- STORM DRAIN
- PROPOSED FLOW DIRECTION ARROW
- X — DRAINAGE AREA DESIGNATION
- X.XX — AREA (AC)
- A=X.XX — SUB–DRAINAGE AREA (AC)
- 1 — STREAM #
- 1.3 — NODE

DRAINAGE NOTES:

1. PROPOSED ONSITE CATCH BASIN WITH FILTER INSERT
2. PROPOSED STORM DRAIN PIPE PRIVATE MAINTAINED
3. PROPOSED PUBLIC STORM DRAIN (OFFSITE RUN–ON)
4. PROPOSED DIVERSION STRUCTURE
5. PROPOSED BMP – HYDRODYNAMIC SEPARATOR
6. PROPOSED BMP – UNDERGROUND DETENTION BASIN
7. PROPOSED BMP – MODULAR WETLAND SYSTEM
8. PROPOSED HEADWALL AND RIPRAP

HYDROLOGY SUMMARY

DRAINAGE AREA NO.	TRIBUTARY AREA (SF)	TRIBUTARY AREA (AC)	IMPERVIOUS RATIO	Q_2 (CFS)	V_2 (CF)	Q_{100} (CFS)	V_{100} (CF)	DETENTION PROVIDED (CF)
A1	2,395,846	55.00	0.79	66.39	314,277	182.01	921,542	450,183 (UNDERGROUND 144" CMP #1)
A2	825,588	18.95	0.66	22.01	91,419	60.48	300,769	137,857 (UNDERGROUND 144" CMP #1)
A3	2,525,082	57.97	0.80	72.17	336,484	197.53	977,434	538,370 (UNDERGROUND 144" CMP #1)
A4	4,138,851	95.01	0.00	17.76	61,968	182.33	1,558,607	–
B	3,004,030	68.96	0.00	22.64	50,874	179.72	1,132,068	–
C	456,643	10.48	0.00	3.21	7,623	26.46	172,532	–
D	767,026	17.61	0.00	7.12	13,512	45.51	57,604	–
TOTAL (A1 TO A3)	5,746,516	131.92	0.77	160.57	742,180	440.02	2,199,745	–
TOTAL	14,113,066	323.99	0.32	211.30	876,157	874.04	5,120,556	–

NORTH

GRAPHIC SCALE IN FEET

0 100 200 400

PREPARED BY:

Kimley»Horn

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WWW.KIMLEY–HORN.COM

PACIFIC COMMERCE CENTER

POST-DEVELOPMENT HYDROLOGY EXHIBIT

LIVE OAK CANYON ROAD

CITY OF YUCAIPA

DATE: DEC 2022

SHEET 1 OF 1

12/21/2022

Appendix H

Rational Method Analysis

Appendix H.I

Rational Method Analysis
Pre-Development Conditions
2-Year Storm

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                       Kimley-Horn and Associates, Inc.
                              765 The City Drive
                                  Suite 200
                               Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                 *
* RATIONAL METHOD                                                         *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A1                                        *
 **************************************************************************

  FILE NAME: 2PRRA1.DAT
  TIME/DATE OF STUDY: 16:49 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      1.10 TO NODE      1.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   737.61
  ELEVATION DATA: UPSTREAM(FEET) =   2186.84  DOWNSTREAM(FEET) =   2012.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.832
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.542
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B       10.89      0.67     1.000    61    9.83
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.59
  TOTAL AREA(ACRES) =     10.89   PEAK FLOW RATE(CFS) =      8.59
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       10.9  TC(MIN.) =      9.83
  EFFECTIVE AREA(ACRES) =     10.89  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       8.59
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                       Kimley-Horn and Associates, Inc.
                              765 The City Drive
                                  Suite 200
                               Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A2                            *
 ************************************************************************

  FILE NAME: 2PRRA2.DAT
  TIME/DATE OF STUDY: 17:18 12/27/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      2.10 TO NODE      2.20 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.99
  ELEVATION DATA: UPSTREAM(FEET) =   2230.29  DOWNSTREAM(FEET) =   2217.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.693
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.466
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        1.43      0.67     1.000    61   10.69
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.03
  TOTAL AREA(ACRES) =      1.43   PEAK FLOW RATE(CFS) =      1.03

****************************************************************************
  FLOW PROCESS FROM NODE      2.20 TO NODE      2.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2217.74  DOWNSTREAM(FEET) =   2036.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.94   CHANNEL SLOPE =  0.1079
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.952
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       19.19      0.67     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.49
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  11.28
  Tc(MIN.) =   21.98
  SUBAREA AREA(ACRES) =    19.19       SUBAREA RUNOFF(CFS) =    4.94
  EFFECTIVE AREA(ACRES) =     20.62     AREA-AVERAGED Fm(INCH/HR) =   0.67
  AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.6         PEAK FLOW RATE(CFS) =       5.30

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE      2.10 TO NODE      2.30 =    2035.93 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       20.6  TC(MIN.) =     21.98
  EFFECTIVE AREA(ACRES) =     20.62  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       5.30
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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             Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                       Kimley-Horn and Associates, Inc.
                              765 The City Drive
                                  Suite 200
                               Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A3                             *
 **************************************************************************

  FILE NAME: 2PRRA3.DAT
  TIME/DATE OF STUDY: 17:20 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      3.10 TO NODE      3.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   198.58
  ELEVATION DATA: UPSTREAM(FEET) =   2226.76  DOWNSTREAM(FEET) =   2175.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.721
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.134
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        0.96      0.67     1.000    61    5.72
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.27
  TOTAL AREA(ACRES) =      0.96   PEAK FLOW RATE(CFS) =      1.27

****************************************************************************
  FLOW PROCESS FROM NODE      3.20 TO NODE      3.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2175.80  DOWNSTREAM(FEET) =   2080.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1074.00   CHANNEL SLOPE =  0.0885
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.393
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       25.70      0.67     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.02
  AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   5.93
  Tc(MIN.) =   11.65
  SUBAREA AREA(ACRES) =    25.70       SUBAREA RUNOFF(CFS) =   16.82
  EFFECTIVE AREA(ACRES) =     26.66     AREA-AVERAGED Fm(INCH/HR) =   0.67
  AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.7         PEAK FLOW RATE(CFS) =      17.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   3.48
  LONGEST FLOWPATH FROM NODE      3.10 TO NODE      3.30 =    1272.58 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       26.7  TC(MIN.) =     11.65
  EFFECTIVE AREA(ACRES) =     26.66  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      17.45
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A4                             *
 ************************************************************************

  FILE NAME: 2PRRA4.DAT
  TIME/DATE OF STUDY: 17:21 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      4.10 TO NODE      4.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   359.20
  ELEVATION DATA: UPSTREAM(FEET) =   2252.44  DOWNSTREAM(FEET) =   2184.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.698
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.786
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        4.74      0.67     1.000    61    7.70
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.78
  TOTAL AREA(ACRES) =      4.74   PEAK FLOW RATE(CFS) =      4.78

****************************************************************************
  FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2184.08  DOWNSTREAM(FEET) =   2075.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1570.23   CHANNEL SLOPE =  0.0691
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.131
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       43.66      0.67     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.98
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   8.78
  Tc(MIN.) =   16.47
  SUBAREA AREA(ACRES) =    43.66       SUBAREA RUNOFF(CFS) =   18.29
  EFFECTIVE AREA(ACRES) =     48.40     AREA-AVERAGED Fm(INCH/HR) =   0.67
  AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.4         PEAK FLOW RATE(CFS) =      20.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   3.16
  LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =    1929.43 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       48.4  TC(MIN.) =     16.47
  EFFECTIVE AREA(ACRES) =     48.40  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      20.28
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                       Kimley-Horn and Associates, Inc.
                              765 The City Drive
                                  Suite 200
                               Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A5                             *
 ************************************************************************

  FILE NAME: 2PRRA5.DAT
  TIME/DATE OF STUDY: 17:23 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      5.10 TO NODE      5.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   536.20
  ELEVATION DATA: UPSTREAM(FEET) =   2238.68  DOWNSTREAM(FEET) =   2201.18

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.039
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.439
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        2.57      0.67     1.000    61   11.04
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.79
  TOTAL AREA(ACRES) =      2.57   PEAK FLOW RATE(CFS) =      1.79

****************************************************************************
  FLOW PROCESS FROM NODE      5.20 TO NODE      5.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2201.18  DOWNSTREAM(FEET) =   1988.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4430.41   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.571
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       83.09      0.67     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.83
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =  40.42
  Tc(MIN.) =   51.46
  SUBAREA AREA(ACRES) =    83.09       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =     85.66     AREA-AVERAGED Fm(INCH/HR) =   0.67
  AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =       85.7         PEAK FLOW RATE(CFS) =       1.79
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   1.46
  LONGEST FLOWPATH FROM NODE      5.10 TO NODE      5.30 =    4966.61 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       85.7  TC(MIN.) =     51.46
  EFFECTIVE AREA(ACRES) =     85.66  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       1.79
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                       Kimley-Horn and Associates, Inc.
                              765 The City Drive
                                  Suite 200
                               Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A6                             *
 ************************************************************************

  FILE NAME: 2PRRA6.DAT
  TIME/DATE OF STUDY: 17:25 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      6.10 TO NODE      6.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   373.53
  ELEVATION DATA: UPSTREAM(FEET) =   2247.99  DOWNSTREAM(FEET) =   2190.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.147
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.726
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        3.54      0.67     1.000    61    8.15
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.38
  TOTAL AREA(ACRES) =      3.54   PEAK FLOW RATE(CFS) =      3.38

****************************************************************************
  FLOW PROCESS FROM NODE      6.20 TO NODE      6.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2190.08  DOWNSTREAM(FEET) =   2098.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2640.80   CHANNEL SLOPE =  0.0348
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.828
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       86.21      0.67     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.25
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =  19.59
  Tc(MIN.) =   27.74
  SUBAREA AREA(ACRES) =    86.21       SUBAREA RUNOFF(CFS) =   12.55
  EFFECTIVE AREA(ACRES) =     89.75     AREA-AVERAGED Fm(INCH/HR) =   0.67
  AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       89.8         PEAK FLOW RATE(CFS) =      13.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   2.28
  LONGEST FLOWPATH FROM NODE      6.10 TO NODE      6.30 =    3014.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       89.8  TC(MIN.) =     27.74
  EFFECTIVE AREA(ACRES) =     89.75  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      13.06
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

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                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A7                             *
 **************************************************************************

  FILE NAME: 2PRRA7.DAT
  TIME/DATE OF STUDY: 17:26 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      7.10 TO NODE      7.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.76
  ELEVATION DATA: UPSTREAM(FEET) =   2256.61  DOWNSTREAM(FEET) =   2192.89

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.295
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.845
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        2.75      0.67     1.000    61    7.29
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.92
  TOTAL AREA(ACRES) =      2.75   PEAK FLOW RATE(CFS) =      2.92

****************************************************************************
  FLOW PROCESS FROM NODE      7.20 TO NODE      7.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2192.89  DOWNSTREAM(FEET) =   2145.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.18   CHANNEL SLOPE =  0.0423
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.207
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       39.27      0.67     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.47
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   7.50
  Tc(MIN.) =   14.79
  SUBAREA AREA(ACRES) =    39.27       SUBAREA RUNOFF(CFS) =   19.12
  EFFECTIVE AREA(ACRES) =     42.02     AREA-AVERAGED Fm(INCH/HR) =   0.67
  AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.0         PEAK FLOW RATE(CFS) =      20.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   2.68
  LONGEST FLOWPATH FROM NODE      7.10 TO NODE      7.30 =    1430.94 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       42.0  TC(MIN.) =     14.79
  EFFECTIVE AREA(ACRES) =     42.02  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      20.46
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix H.II

Rational Method Analysis
Pre-Development Conditions
100-Year Storm

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A1                                    *
 **************************************************************************

  FILE NAME: 100PRRA1.DAT
  TIME/DATE OF STUDY: 16:35 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

**************************************************************************
  FLOW PROCESS FROM NODE      1.10 TO NODE      1.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   737.61
  ELEVATION DATA: UPSTREAM(FEET) =   2186.84  DOWNSTREAM(FEET) =   2012.61

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.832
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.996
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B       10.89      0.18     1.000    93    9.83
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     37.40
  TOTAL AREA(ACRES) =     10.89   PEAK FLOW RATE(CFS) =     37.40
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       10.9  TC(MIN.) =      9.83
  EFFECTIVE AREA(ACRES) =     10.89  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      37.40
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A2                           *
 **************************************************************************

  FILE NAME: 100PRRA2.DAT
  TIME/DATE OF STUDY: 16:56 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

**************************************************************************
  FLOW PROCESS FROM NODE      2.10 TO NODE      2.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   352.99
  ELEVATION DATA: UPSTREAM(FEET) =   2230.29  DOWNSTREAM(FEET) =   2217.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.693
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.800
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        1.43      0.18     1.000    93   10.69
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.66
  TOTAL AREA(ACRES) =      1.43   PEAK FLOW RATE(CFS) =      4.66

****************************************************************************
  FLOW PROCESS FROM NODE      2.20 TO NODE      2.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2217.74  DOWNSTREAM(FEET) =   2036.13
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1682.94   CHANNEL SLOPE =  0.1079
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.824
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                     B       19.19      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.10
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   6.85
  Tc(MIN.) =   17.54
  SUBAREA AREA(ACRES) =    19.19       SUBAREA RUNOFF(CFS) =   45.66
  EFFECTIVE AREA(ACRES) =     20.62     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       20.6         PEAK FLOW RATE(CFS) =      49.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   4.72
  LONGEST FLOWPATH FROM NODE      2.10 TO NODE      2.30 =    2035.93 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       20.6  TC(MIN.) =     17.54
  EFFECTIVE AREA(ACRES) =     20.62  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      49.06
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A3                           *
 **************************************************************************

  FILE NAME: 100PRRA3.DAT
  TIME/DATE OF STUDY: 17:00 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

**************************************************************************
  FLOW PROCESS FROM NODE      3.10 TO NODE      3.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   198.58
  ELEVATION DATA: UPSTREAM(FEET) =   2226.76  DOWNSTREAM(FEET) =   2175.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.721
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.530
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        0.96      0.18     1.000    93    5.72
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      4.62
  TOTAL AREA(ACRES) =      0.96   PEAK FLOW RATE(CFS) =      4.62

****************************************************************************
  FLOW PROCESS FROM NODE      3.20 TO NODE      3.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2175.80  DOWNSTREAM(FEET) =   2080.75
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1074.00   CHANNEL SLOPE =  0.0885
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.036
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       25.70      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.53
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   3.95
  Tc(MIN.) =    9.67
  SUBAREA AREA(ACRES) =    25.70       SUBAREA RUNOFF(CFS) =   89.19
  EFFECTIVE AREA(ACRES) =     26.66     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       26.7         PEAK FLOW RATE(CFS) =      92.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   5.19
  LONGEST FLOWPATH FROM NODE      3.10 TO NODE      3.30 =    1272.58 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       26.7  TC(MIN.) =      9.67
  EFFECTIVE AREA(ACRES) =     26.66  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      92.52
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

                       Kimley-Horn and Associates, Inc.
                              765 The City Drive
                                  Suite 200
                               Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A4                          *
 ************************************************************************

  FILE NAME: 100PRRA4.DAT
  TIME/DATE OF STUDY: 17:03 12/27/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

************************************************************************
  FLOW PROCESS FROM NODE      4.10 TO NODE      4.20 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   359.20
  ELEVATION DATA: UPSTREAM(FEET) =   2252.44  DOWNSTREAM(FEET) =   2184.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.698
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.628
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        4.74      0.18     1.000    93    7.70
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     18.97
  TOTAL AREA(ACRES) =      4.74   PEAK FLOW RATE(CFS) =     18.97

****************************************************************************
  FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2184.08  DOWNSTREAM(FEET) =   2075.56
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1570.23   CHANNEL SLOPE =  0.0691
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.321
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       43.66      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
  AVERAGE FLOW DEPTH(FEET) =   0.38   TRAVEL TIME(MIN.) =   5.69
  Tc(MIN.) =   13.39
  SUBAREA AREA(ACRES) =    43.66       SUBAREA RUNOFF(CFS) =  123.41
  EFFECTIVE AREA(ACRES) =     48.40     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       48.4         PEAK FLOW RATE(CFS) =     136.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =   5.18
  LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =    1929.43 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       48.4  TC(MIN.) =     13.39
  EFFECTIVE AREA(ACRES) =     48.40  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     136.81
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A5                          *
 ************************************************************************

  FILE NAME: 100PRRA5.DAT
  TIME/DATE OF STUDY: 17:08 12/27/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

************************************************************************
  FLOW PROCESS FROM NODE      5.10 TO NODE      5.20 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   536.20
  ELEVATION DATA: UPSTREAM(FEET) =   2238.68  DOWNSTREAM(FEET) =   2201.18

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.039
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.728
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        2.57      0.18     1.000    93   11.04
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      8.21
  TOTAL AREA(ACRES) =      2.57   PEAK FLOW RATE(CFS) =      8.21

****************************************************************************
  FLOW PROCESS FROM NODE      5.20 TO NODE      5.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2201.18  DOWNSTREAM(FEET) =   1988.09
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4430.41   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.077
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       83.09      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      82.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.05
  AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =  18.23
  Tc(MIN.) =   29.27
  SUBAREA AREA(ACRES) =    83.09       SUBAREA RUNOFF(CFS) =  141.83
  EFFECTIVE AREA(ACRES) =     85.66     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       85.7         PEAK FLOW RATE(CFS) =     146.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   4.64
  LONGEST FLOWPATH FROM NODE      5.10 TO NODE      5.30 =    4966.61 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       85.7  TC(MIN.) =     29.27
  EFFECTIVE AREA(ACRES) =     85.66  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     146.21
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************ DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                                *
* RATIONAL METHOD                                                        *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A6                           *
 **************************************************************************

  FILE NAME: 100PRRA6.DAT
  TIME/DATE OF STUDY: 17:10 12/27/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

**************************************************************************
  FLOW PROCESS FROM NODE      6.10 TO NODE      6.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   373.53
  ELEVATION DATA: UPSTREAM(FEET) =   2247.99  DOWNSTREAM(FEET) =   2190.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.147
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.473
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        3.54      0.18     1.000    93    8.15
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.68
  TOTAL AREA(ACRES) =      3.54   PEAK FLOW RATE(CFS) =     13.68

****************************************************************************
  FLOW PROCESS FROM NODE      6.20 TO NODE      6.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2190.08  DOWNSTREAM(FEET) =   2098.18
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2640.80   CHANNEL SLOPE =  0.0348
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.640
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       86.21      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     113.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.84
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =  11.47
  Tc(MIN.) =   19.62
  SUBAREA AREA(ACRES) =    86.21       SUBAREA RUNOFF(CFS) =  190.89
  EFFECTIVE AREA(ACRES) =     89.75     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       89.8         PEAK FLOW RATE(CFS) =     198.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.62   FLOW VELOCITY(FEET/SEC.) =   4.45
  LONGEST FLOWPATH FROM NODE      6.10 TO NODE      6.30 =    3014.33 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       89.8  TC(MIN.) =     19.62
  EFFECTIVE AREA(ACRES) =     89.75  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     198.73
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A7                          *
 ************************************************************************

  FILE NAME: 100PRRA7.DAT
  TIME/DATE OF STUDY: 17:15 12/27/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

************************************************************************
  FLOW PROCESS FROM NODE      7.10 TO NODE      7.20 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.76
  ELEVATION DATA: UPSTREAM(FEET) =   2256.61  DOWNSTREAM(FEET) =   2192.89

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.295
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.780
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    B        2.75      0.18     1.000    93    7.29
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     11.38
  TOTAL AREA(ACRES) =      2.75   PEAK FLOW RATE(CFS) =     11.38

****************************************************************************
  FLOW PROCESS FROM NODE      7.20 TO NODE      7.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2192.89  DOWNSTREAM(FEET) =   2145.91
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.18   CHANNEL SLOPE =  0.0423
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.497
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "GRASS"                    B       39.27      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.71
  AVERAGE FLOW DEPTH(FEET) =   0.39   TRAVEL TIME(MIN.) =   4.99
  Tc(MIN.) =   12.28
  SUBAREA AREA(ACRES) =    39.27       SUBAREA RUNOFF(CFS) =  117.24
  EFFECTIVE AREA(ACRES) =     42.02     AREA-AVERAGED Fm(INCH/HR) =   0.18
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       42.0         PEAK FLOW RATE(CFS) =     125.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   4.24
  LONGEST FLOWPATH FROM NODE      7.10 TO NODE      7.30 =    1430.94 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       42.0  TC(MIN.) =     12.28
  EFFECTIVE AREA(ACRES) =     42.02  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     125.45
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix H.III

Rational Method Analysis
Post-Development Conditions
2-Year Storm

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

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA A1
       *
 **************************************************************************

  FILE NAME: 2PORA1.DAT
  TIME/DATE OF STUDY: 21:03 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      1.10 TO NODE      1.20 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.09
ELEVATION DATA: UPSTREAM(FEET) =   2183.45  DOWNSTREAM(FEET) =   2177.05

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.082
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.435
SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
COMMERCIAL                 B        8.99      0.94     0.100    36   11.08
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
SUBAREA RUNOFF(CFS) =     10.85
TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =     10.85

****************************************************************************
FLOW PROCESS FROM NODE      1.20 TO NODE      1.20 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   11.08
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.435
SUBAREA LOSS RATE DATA(AMC  I ):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                 B       46.01      0.94     0.100    36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
SUBAREA AREA(ACRES) =   46.01      SUBAREA RUNOFF(CFS) =   55.54
EFFECTIVE AREA(ACRES) =     55.00   AREA-AVERAGED Fm(INCH/HR) =  0.09
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.10
TOTAL AREA(ACRES) =       55.0       PEAK FLOW RATE(CFS) =      66.39
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =       55.0  TC(MIN.) =     11.08
EFFECTIVE AREA(ACRES) =     55.00  AREA-AVERAGED Fm(INCH/HR)=  0.09
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS)   =      66.39
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

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

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA A2
       *
 **************************************************************************

  FILE NAME: 2PORA2.DAT
  TIME/DATE OF STUDY: 21:02 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      2.10 TO NODE      2.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   974.96
 ELEVATION DATA: UPSTREAM(FEET) =   2215.44  DOWNSTREAM(FEET) =   2204.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.773
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.384
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        9.76      0.94     0.100    36   11.77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =     11.33
 TOTAL AREA(ACRES) =      9.76   PEAK FLOW RATE(CFS) =     11.33

****************************************************************************
 FLOW PROCESS FROM NODE      2.20 TO NODE      2.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   11.77
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.384
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        9.20      0.94     0.100    36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    9.20      SUBAREA RUNOFF(CFS) =   10.68
 EFFECTIVE AREA(ACRES) =     18.96   AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       19.0       PEAK FLOW RATE(CFS) =      22.01
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       19.0  TC(MIN.) =     11.77
 EFFECTIVE AREA(ACRES) =     18.96  AREA-AVERAGED Fm(INCH/HR)=  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =      22.01
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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            Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA A3
       *
 **************************************************************************

  FILE NAME: 2PORA3.DAT
  TIME/DATE OF STUDY: 21:04 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      3.10 TO NODE      3.20 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.28
ELEVATION DATA: UPSTREAM(FEET) =   2166.00  DOWNSTREAM(FEET) =   2161.35

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.560
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.477
SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
COMMERCIAL                B        7.66      0.94     0.100    36   10.56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
SUBAREA RUNOFF(CFS) =      9.54
TOTAL AREA(ACRES) =      7.66   PEAK FLOW RATE(CFS) =      9.54

****************************************************************************
FLOW PROCESS FROM NODE      3.20 TO NODE      3.20 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   10.56
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.477
SUBAREA LOSS RATE DATA(AMC  I ):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                B       50.31      0.94     0.100    36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
SUBAREA AREA(ACRES) =   50.31      SUBAREA RUNOFF(CFS) =   62.63
EFFECTIVE AREA(ACRES) =     57.97   AREA-AVERAGED Fm(INCH/HR) =  0.09
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.10
TOTAL AREA(ACRES) =       58.0       PEAK FLOW RATE(CFS) =      72.17
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =       58.0  TC(MIN.) =     10.56
EFFECTIVE AREA(ACRES) =     57.97  AREA-AVERAGED Fm(INCH/HR)=  0.09
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS)   =      72.17
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

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

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA A4
       *
 **************************************************************************

  FILE NAME: 2PORA4.DAT
  TIME/DATE OF STUDY: 21:09 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      4.10 TO NODE      4.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   511.33
 ELEVATION DATA: UPSTREAM(FEET) =   2250.00  DOWNSTREAM(FEET) =   2249.23

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   23.339
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.918
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        9.33      0.67     1.000    61   23.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      2.12
 TOTAL AREA(ACRES) =      9.33   PEAK FLOW RATE(CFS) =      2.12

****************************************************************************
 FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2249.23  DOWNSTREAM(FEET) =   2036.15
 CHANNEL LENGTH THRU SUBAREA(FEET) =   599.32   CHANNEL SLOPE =  0.3555
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.874
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B       85.68      0.67     1.000    61
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.19
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.97
 AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   2.01
 Tc(MIN.) =   25.35
 SUBAREA AREA(ACRES) =    85.68       SUBAREA RUNOFF(CFS) =   16.01
 EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.67
 AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =      17.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   5.66
  LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =    1110.65 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       95.0  TC(MIN.) =     25.35
  EFFECTIVE AREA(ACRES) =     95.01  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      17.76
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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            Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA B
       *
 **************************************************************************

  FILE NAME: 2PORB.DAT
  TIME/DATE OF STUDY: 21:11 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      5.10 TO NODE      5.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   477.56
 ELEVATION DATA: UPSTREAM(FEET) =   2253.81  DOWNSTREAM(FEET) =   2114.10

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.916
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.756
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        8.31      0.67     1.000    61    7.92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      8.15
 TOTAL AREA(ACRES) =      8.31   PEAK FLOW RATE(CFS) =      8.15

****************************************************************************
 FLOW PROCESS FROM NODE      5.20 TO NODE      5.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2114.10  DOWNSTREAM(FEET) =   2075.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1506.57   CHANNEL SLOPE =  0.0260
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.031
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B       60.65      0.67     1.000    61
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.22
 AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =  11.32
 Tc(MIN.) =   19.24
 SUBAREA AREA(ACRES) =    60.65       SUBAREA RUNOFF(CFS) =   19.92
 EFFECTIVE AREA(ACRES) =     68.96     AREA-AVERAGED Fm(INCH/HR) =   0.67
 AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       69.0         PEAK FLOW RATE(CFS) =      22.64

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.27   FLOW VELOCITY(FEET/SEC.) =   2.28
  LONGEST FLOWPATH FROM NODE      5.10 TO NODE      5.30 =    1984.13 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       69.0  TC(MIN.) =     19.24
  EFFECTIVE AREA(ACRES) =     68.96  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      22.64
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA C
       *
 **************************************************************************

  FILE NAME: 2PORC.DAT
  TIME/DATE OF STUDY: 21:13 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      6.10 TO NODE      6.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   410.53
 ELEVATION DATA: UPSTREAM(FEET) =   2240.52  DOWNSTREAM(FEET) =   2191.25

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.905
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.637
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        2.12      0.67     1.000    61    8.91
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      1.85
 TOTAL AREA(ACRES) =      2.12   PEAK FLOW RATE(CFS) =      1.85

****************************************************************************
 FLOW PROCESS FROM NODE      6.20 TO NODE      6.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2191.25  DOWNSTREAM(FEET) =   2146.47
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1087.24   CHANNEL SLOPE =  0.0412
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.006
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B        8.36      0.67     1.000    61
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.63
 AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =  11.13
 Tc(MIN.) =   20.04
 SUBAREA AREA(ACRES) =     8.36       SUBAREA RUNOFF(CFS) =    2.56
 EFFECTIVE AREA(ACRES) =     10.48     AREA-AVERAGED Fm(INCH/HR) =   0.67
 AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       10.5         PEAK FLOW RATE(CFS) =       3.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   1.70
  LONGEST FLOWPATH FROM NODE      6.10 TO NODE      6.30 =    1497.77 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       10.5  TC(MIN.) =     20.04
  EFFECTIVE AREA(ACRES) =     10.48  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       3.21
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 2-YEAR STORM EVENT, DA D
       *
 **************************************************************************

  FILE NAME: 2PORD.DAT
  TIME/DATE OF STUDY: 21:15 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.5210

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

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

  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      7.10 TO NODE      7.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   502.23
 ELEVATION DATA: UPSTREAM(FEET) =   2149.58  DOWNSTREAM(FEET) =   2134.93

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.810
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        3.79      0.67     1.000    61   12.81
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      2.22
 TOTAL AREA(ACRES) =      3.79   PEAK FLOW RATE(CFS) =      2.22

****************************************************************************
 FLOW PROCESS FROM NODE      7.20 TO NODE      7.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2134.93  DOWNSTREAM(FEET) =   2104.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =   523.89   CHANNEL SLOPE =  0.0586
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.116
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B       13.82      0.67     1.000    61
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.05
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
 AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   4.06
 Tc(MIN.) =   16.87
 SUBAREA AREA(ACRES) =    13.82       SUBAREA RUNOFF(CFS) =    5.59
 EFFECTIVE AREA(ACRES) =     17.61     AREA-AVERAGED Fm(INCH/HR) =   0.67
 AREA-AVERAGED Fp(INCH/HR) =   0.67  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       17.6         PEAK FLOW RATE(CFS) =       7.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   2.32
  LONGEST FLOWPATH FROM NODE      7.10 TO NODE      7.30 =    1026.12 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       17.6  TC(MIN.) =     16.87
  EFFECTIVE AREA(ACRES) =     17.61  AREA-AVERAGED Fm(INCH/HR)=  0.67
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       7.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix H.IV

Rational Method Analysis
Post-Development Conditions
100-Year Storm

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

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA A1
       *
 **************************************************************************

  FILE NAME: 100PORA1.DAT
  TIME/DATE OF STUDY: 21:18 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      1.10 TO NODE      1.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   744.09
 ELEVATION DATA: UPSTREAM(FEET) =   2183.45  DOWNSTREAM(FEET) =   2177.05

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.082
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.719
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        8.99      0.42     0.100    76   11.08
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =     29.75
 TOTAL AREA(ACRES) =      8.99   PEAK FLOW RATE(CFS) =     29.75

****************************************************************************
 FLOW PROCESS FROM NODE      1.20 TO NODE      1.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   11.08
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.719
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       46.01      0.42     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =   46.01      SUBAREA RUNOFF(CFS) =  152.26
 EFFECTIVE AREA(ACRES) =     55.00   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       55.0       PEAK FLOW RATE(CFS) =     182.01
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       55.0  TC(MIN.) =     11.08
 EFFECTIVE AREA(ACRES) =     55.00  AREA-AVERAGED Fm(INCH/HR)=  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =     182.01
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA A2
       *
 **************************************************************************

  FILE NAME: 100PORA2.DAT
  TIME/DATE OF STUDY: 21:19 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      2.10 TO NODE      2.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   974.96
 ELEVATION DATA: UPSTREAM(FEET) =   2215.44  DOWNSTREAM(FEET) =   2204.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.773
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.587
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        9.76      0.42     0.100    76   11.77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =     31.13
 TOTAL AREA(ACRES) =      9.76   PEAK FLOW RATE(CFS) =     31.13

****************************************************************************
 FLOW PROCESS FROM NODE      2.20 TO NODE      2.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   11.77
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.587
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        9.20      0.42     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    9.20      SUBAREA RUNOFF(CFS) =   29.35
 EFFECTIVE AREA(ACRES) =     18.96   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       19.0       PEAK FLOW RATE(CFS) =      60.48
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       19.0  TC(MIN.) =     11.77
 EFFECTIVE AREA(ACRES) =     18.96  AREA-AVERAGED Fm(INCH/HR)=  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =      60.48
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA A3
       *
 **************************************************************************

  FILE NAME: 100PORA3.DAT
  TIME/DATE OF STUDY: 21:20 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      3.10 TO NODE      3.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   617.28
 ELEVATION DATA: UPSTREAM(FEET) =   2166.00  DOWNSTREAM(FEET) =   2161.35

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.560
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.828
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        7.66      0.42     0.100    76   10.56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =     26.10
 TOTAL AREA(ACRES) =      7.66   PEAK FLOW RATE(CFS) =     26.10

****************************************************************************
 FLOW PROCESS FROM NODE      3.20 TO NODE      3.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   10.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.828
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       50.31      0.42     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =   50.31      SUBAREA RUNOFF(CFS) =  171.43
 EFFECTIVE AREA(ACRES) =     57.97   AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       58.0       PEAK FLOW RATE(CFS) =     197.53
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       58.0  TC(MIN.) =     10.56
 EFFECTIVE AREA(ACRES) =     57.97  AREA-AVERAGED Fm(INCH/HR)=  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.42  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =     197.53
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA A4
       *
 **************************************************************************

  FILE NAME: 100PORA4.DAT
  TIME/DATE OF STUDY: 21:21 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      4.10 TO NODE      4.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   511.33
 ELEVATION DATA: UPSTREAM(FEET) =   2250.00  DOWNSTREAM(FEET) =   2249.23

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   23.339
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.379
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        9.33      0.18     1.000    93   23.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     18.46
 TOTAL AREA(ACRES) =      9.33   PEAK FLOW RATE(CFS) =     18.46

****************************************************************************
 FLOW PROCESS FROM NODE      4.20 TO NODE      4.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2249.23  DOWNSTREAM(FEET) =   2036.15
 CHANNEL LENGTH THRU SUBAREA(FEET) =   599.32   CHANNEL SLOPE =  0.3555
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.312
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B       85.68      0.18     1.000    93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.83
 AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   1.13
 Tc(MIN.) =   24.47
 SUBAREA AREA(ACRES) =    85.68       SUBAREA RUNOFF(CFS) =  164.42
 EFFECTIVE AREA(ACRES) =     95.01     AREA-AVERAGED Fm(INCH/HR) =   0.18
 AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       95.0         PEAK FLOW RATE(CFS) =     182.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =  10.52
  LONGEST FLOWPATH FROM NODE      4.10 TO NODE      4.30 =    1110.65 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       95.0  TC(MIN.) =     24.47
  EFFECTIVE AREA(ACRES) =     95.01  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     182.33
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA B
       *
 **************************************************************************

  FILE NAME: 100PORB.DAT
  TIME/DATE OF STUDY: 21:22 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      5.10 TO NODE      5.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   477.56
 ELEVATION DATA: UPSTREAM(FEET) =   2253.81  DOWNSTREAM(FEET) =   2114.10

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.916
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.551
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        8.31      0.18     1.000    93    7.92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     32.69
 TOTAL AREA(ACRES) =      8.31   PEAK FLOW RATE(CFS) =     32.69

****************************************************************************
 FLOW PROCESS FROM NODE      5.20 TO NODE      5.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2114.10  DOWNSTREAM(FEET) =   2075.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1506.57   CHANNEL SLOPE =  0.0260
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.076
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B       60.65      0.18     1.000    93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     113.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.44
 AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   7.29
 Tc(MIN.) =   15.21
 SUBAREA AREA(ACRES) =    60.65       SUBAREA RUNOFF(CFS) =  158.06
 EFFECTIVE AREA(ACRES) =     68.96     AREA-AVERAGED Fm(INCH/HR) =   0.18
 AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       69.0         PEAK FLOW RATE(CFS) =     179.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.64   FLOW VELOCITY(FEET/SEC.) =   3.87
  LONGEST FLOWPATH FROM NODE      5.10 TO NODE      5.30 =    1984.13 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       69.0  TC(MIN.) =     15.21
  EFFECTIVE AREA(ACRES) =     68.96  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =     179.72
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA C
       *
 **************************************************************************

  FILE NAME: 100PORC.DAT
  TIME/DATE OF STUDY: 21:23 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      6.10 TO NODE      6.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   410.53
 ELEVATION DATA: UPSTREAM(FEET) =   2240.52  DOWNSTREAM(FEET) =   2191.25

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.905
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.241
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        2.12      0.18     1.000    93    8.91
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      7.75
 TOTAL AREA(ACRES) =      2.12   PEAK FLOW RATE(CFS) =      7.75

****************************************************************************
 FLOW PROCESS FROM NODE      6.20 TO NODE      6.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2191.25  DOWNSTREAM(FEET) =   2146.47
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1087.24   CHANNEL SLOPE =  0.0412
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.985
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B        8.36      0.18     1.000    93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.47
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.56
 AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   7.08
 Tc(MIN.) =   15.98
 SUBAREA AREA(ACRES) =     8.36       SUBAREA RUNOFF(CFS) =   21.11
 EFFECTIVE AREA(ACRES) =     10.48     AREA-AVERAGED Fm(INCH/HR) =   0.18
 AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       10.5         PEAK FLOW RATE(CFS) =      26.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOW VELOCITY(FEET/SEC.) =   2.81
  LONGEST FLOWPATH FROM NODE      6.10 TO NODE      6.30 =    1497.77 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       10.5  TC(MIN.) =     15.98
  EFFECTIVE AREA(ACRES) =     10.48  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      26.46
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2011 Advanced Engineering Software (aes)
            Ver. 18.0  Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************* DESCRIPTION OF STUDY *************************
* PACIFIC COMMERCE CENTER                                               *
* RATIONAL METHOD                                                       *
* POST DEVELOPMENT, 100-YEAR STORM EVENT, DA D
       *
 **************************************************************************

  FILE NAME: 100PORD.DAT
  TIME/DATE OF STUDY: 21:24 12/22/2022
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.3500

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

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

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

```
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
 FLOW PROCESS FROM NODE      7.10 TO NODE      7.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   502.23
 ELEVATION DATA: UPSTREAM(FEET) =   2149.58  DOWNSTREAM(FEET) =   2134.93

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.810
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.410
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 NATURAL POOR COVER
 "GRASS"                    B        3.79      0.18     1.000    93   12.81
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =     11.02
 TOTAL AREA(ACRES) =      3.79   PEAK FLOW RATE(CFS) =     11.02

****************************************************************************
 FLOW PROCESS FROM NODE      7.20 TO NODE      7.30 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2134.93  DOWNSTREAM(FEET) =   2104.25
 CHANNEL LENGTH THRU SUBAREA(FEET) =   523.89   CHANNEL SLOPE =  0.0586
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.051
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "GRASS"                    B       13.82      0.18     1.000    93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.91
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.35
 AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   2.60
 Tc(MIN.) =   15.41
 SUBAREA AREA(ACRES) =    13.82       SUBAREA RUNOFF(CFS) =   35.71
 EFFECTIVE AREA(ACRES) =     17.61     AREA-AVERAGED Fm(INCH/HR) =   0.18
 AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   1.00
```

```
  TOTAL AREA(ACRES) =       17.6         PEAK FLOW RATE(CFS) =      45.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOW VELOCITY(FEET/SEC.) =   3.77
  LONGEST FLOWPATH FROM NODE      7.10 TO NODE      7.30 =    1026.12 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       17.6  TC(MIN.) =     15.41
  EFFECTIVE AREA(ACRES) =     17.61  AREA-AVERAGED Fm(INCH/HR)=  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      45.51
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix I

Synthetic Unit Hydrograph Method Analysis

Appendix I.I

Synthetic Unit Hydrograph Method Analysis
Pre-Development Conditions
2-Year Storm

```
******************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A1
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   10.89
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) =  9.83
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.21
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.01

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.11      0.0001      0.03  Q         .         .         .         .
  0.27      0.0006      0.03  Q         .         .         .         .
  0.44      0.0010      0.03  Q         .         .         .         .
  0.60      0.0014      0.03  Q         .         .         .         .
  0.76      0.0019      0.03  Q         .         .         .         .
  0.93      0.0023      0.03  Q         .         .         .         .
  1.09      0.0028      0.03  Q         .         .         .         .
  1.25      0.0032      0.03  Q         .         .         .         .
  1.42      0.0037      0.03  Q         .         .         .         .
  1.58      0.0041      0.03  Q         .         .         .         .
  1.75      0.0046      0.03  Q         .         .         .         .
  1.91      0.0050      0.03  Q         .         .         .         .
  2.07      0.0055      0.03  Q         .         .         .         .
  2.24      0.0060      0.03  Q         .         .         .         .
  2.40      0.0064      0.03  Q         .         .         .         .
  2.57      0.0069      0.03  Q         .         .         .         .
  2.73      0.0074      0.04  Q         .         .         .         .
  2.89      0.0079      0.04  Q         .         .         .         .
  3.06      0.0083      0.04  Q         .         .         .         .
  3.22      0.0088      0.04  Q         .         .         .         .
  3.38      0.0093      0.04  Q         .         .         .         .
```

3.55	0.0098	0.04	Q	.	.	.	.
3.71	0.0103	0.04	Q	.	.	.	.
3.88	0.0108	0.04	Q	.	.	.	.
4.04	0.0113	0.04	Q	.	.	.	.
4.20	0.0118	0.04	Q	.	.	.	.
4.37	0.0123	0.04	Q	.	.	.	.
4.53	0.0128	0.04	Q	.	.	.	.
4.70	0.0134	0.04	Q	.	.	.	.
4.86	0.0139	0.04	Q	.	.	.	.
5.02	0.0144	0.04	Q	.	.	.	.
5.19	0.0149	0.04	Q	.	.	.	.
5.35	0.0155	0.04	Q	.	.	.	.
5.51	0.0160	0.04	Q	.	.	.	.
5.68	0.0166	0.04	Q	.	.	.	.
5.84	0.0171	0.04	Q	.	.	.	.
6.01	0.0177	0.04	Q	.	.	.	.
6.17	0.0182	0.04	Q	.	.	.	.
6.33	0.0188	0.04	Q	.	.	.	.
6.50	0.0194	0.04	Q	.	.	.	.
6.66	0.0199	0.04	Q	.	.	.	.
6.83	0.0205	0.04	Q	.	.	.	.
6.99	0.0211	0.04	Q	.	.	.	.
7.15	0.0217	0.04	Q	.	.	.	.
7.32	0.0223	0.04	Q	.	.	.	.
7.48	0.0229	0.04	Q	.	.	.	.
7.64	0.0235	0.05	Q	.	.	.	.
7.81	0.0241	0.05	Q	.	.	.	.
7.97	0.0248	0.05	Q	.	.	.	.
8.14	0.0254	0.05	Q	.	.	.	.
8.30	0.0260	0.05	Q	.	.	.	.
8.46	0.0267	0.05	Q	.	.	.	.
8.63	0.0273	0.05	Q	.	.	.	.
8.79	0.0280	0.05	Q	.	.	.	.
8.96	0.0287	0.05	Q	.	.	.	.
9.12	0.0293	0.05	Q	.	.	.	.
9.28	0.0300	0.05	Q	.	.	.	.
9.45	0.0307	0.05	Q	.	.	.	.
9.61	0.0314	0.05	Q	.	.	.	.
9.77	0.0322	0.05	Q	.	.	.	.
9.94	0.0329	0.05	Q	.	.	.	.
10.10	0.0336	0.05	Q	.	.	.	.
10.27	0.0344	0.06	Q	.	.	.	.
10.43	0.0352	0.06	Q	.	.	.	.
10.59	0.0359	0.06	Q	.	.	.	.
10.76	0.0367	0.06	Q	.	.	.	.
10.92	0.0375	0.06	Q	.	.	.	.
11.09	0.0383	0.06	Q	.	.	.	.
11.25	0.0392	0.06	Q	.	.	.	.
11.41	0.0400	0.06	Q	.	.	.	.
11.58	0.0409	0.06	Q	.	.	.	.
11.74	0.0418	0.07	Q	.	.	.	.
11.90	0.0427	0.07	Q	.	.	.	.
12.07	0.0436	0.07	Q	.	.	.	.
12.23	0.0446	0.08	Q	.	.	.	.
12.40	0.0458	0.09	Q	.	.	.	.
12.56	0.0470	0.09	Q	.	.	.	.
12.72	0.0482	0.09	Q	.	.	.	.
12.89	0.0494	0.09	Q	.	.	.	.
13.05	0.0506	0.09	Q	.	.	.	.
13.21	0.0519	0.10	Q	.	.	.	.
13.38	0.0533	0.10	Q	.	.	.	.
13.54	0.0546	0.10	Q	.	.	.	.
13.71	0.0560	0.11	Q	.	.	.	.
13.87	0.0575	0.11	Q	.	.	.	.
14.03	0.0590	0.11	Q	.	.	.	.
14.20	0.0606	0.12	Q	.	.	.	.
14.36	0.0622	0.12	Q	.	.	.	.
14.53	0.0639	0.13	Q	.	.	.	.
14.69	0.0656	0.13	Q	.	.	.	.

```
  14.85      0.0675      0.14  Q         .         .         .         .
  15.02      0.0695      0.15  Q         .         .         .         .
  15.18      0.0716      0.17  Q         .         .         .         .
  15.34      0.0739      0.18  Q         .         .         .         .
  15.51      0.0766      0.21  Q         .         .         .         .
  15.67      0.0795      0.23  Q         .         .         .         .
  15.84      0.0831      0.30  .Q        .         .         .         .
  16.00      0.0878      0.39  .Q        .         .         .         .
  16.16      0.1267      5.37  .         .         .Q        .         .
  16.33      0.1648      0.26  .Q        .         .         .         .
  16.49      0.1679      0.19  Q         .         .         .         .
  16.66      0.1702      0.16  Q         .         .         .         .
  16.82      0.1722      0.14  Q         .         .         .         .
  16.98      0.1740      0.12  Q         .         .         .         .
  17.15      0.1756      0.11  Q         .         .         .         .
  17.31      0.1771      0.11  Q         .         .         .         .
  17.47      0.1785      0.10  Q         .         .         .         .
  17.64      0.1798      0.10  Q         .         .         .         .
  17.80      0.1811      0.09  Q         .         .         .         .
  17.97      0.1823      0.09  Q         .         .         .         .
  18.13      0.1834      0.08  Q         .         .         .         .
  18.29      0.1844      0.07  Q         .         .         .         .
  18.46      0.1853      0.06  Q         .         .         .         .
  18.62      0.1861      0.06  Q         .         .         .         .
  18.79      0.1870      0.06  Q         .         .         .         .
  18.95      0.1877      0.06  Q         .         .         .         .
  19.11      0.1885      0.06  Q         .         .         .         .
  19.28      0.1893      0.05  Q         .         .         .         .
  19.44      0.1900      0.05  Q         .         .         .         .
  19.60      0.1907      0.05  Q         .         .         .         .
  19.77      0.1914      0.05  Q         .         .         .         .
  19.93      0.1920      0.05  Q         .         .         .         .
  20.10      0.1927      0.05  Q         .         .         .         .
  20.26      0.1933      0.05  Q         .         .         .         .
  20.42      0.1939      0.05  Q         .         .         .         .
  20.59      0.1945      0.04  Q         .         .         .         .
  20.75      0.1951      0.04  Q         .         .         .         .
  20.92      0.1957      0.04  Q         .         .         .         .
  21.08      0.1963      0.04  Q         .         .         .         .
  21.24      0.1968      0.04  Q         .         .         .         .
  21.41      0.1974      0.04  Q         .         .         .         .
  21.57      0.1979      0.04  Q         .         .         .         .
  21.73      0.1984      0.04  Q         .         .         .         .
  21.90      0.1990      0.04  Q         .         .         .         .
  22.06      0.1995      0.04  Q         .         .         .         .
  22.23      0.2000      0.04  Q         .         .         .         .
  22.39      0.2005      0.04  Q         .         .         .         .
  22.55      0.2010      0.04  Q         .         .         .         .
  22.72      0.2015      0.04  Q         .         .         .         .
  22.88      0.2019      0.04  Q         .         .         .         .
  23.04      0.2024      0.03  Q         .         .         .         .
  23.21      0.2029      0.03  Q         .         .         .         .
  23.37      0.2033      0.03  Q         .         .         .         .
  23.54      0.2038      0.03  Q         .         .         .         .
  23.70      0.2042      0.03  Q         .         .         .         .
  23.86      0.2047      0.03  Q         .         .         .         .
  24.03      0.2051      0.03  Q         .         .         .         .
  24.19      0.2053      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               Duration
        Peak Flow Rate                    (minutes)
    ======================                =========
              0%                           1445.0
             10%                              9.8
```

20%	9.8
30%	9.8
40%	9.8
50%	9.8
60%	9.8
70%	9.8
80%	9.8
90%	9.8

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A2
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   20.62
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 21.98
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.33
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     3.86

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.25      0.0006      0.06  Q         .         .         .         .
  0.61      0.0025      0.06  Q         .         .         .         .
  0.98      0.0043      0.06  Q         .         .         .         .
  1.35      0.0062      0.06  Q         .         .         .         .
  1.71      0.0081      0.06  Q         .         .         .         .
  2.08      0.0100      0.06  Q         .         .         .         .
  2.45      0.0120      0.07  Q         .         .         .         .
  2.81      0.0140      0.07  Q         .         .         .         .
  3.18      0.0160      0.07  Q         .         .         .         .
  3.54      0.0181      0.07  Q         .         .         .         .
  3.91      0.0202      0.07  Q         .         .         .         .
  4.28      0.0223      0.07  Q         .         .         .         .
  4.64      0.0245      0.07  Q         .         .         .         .
  5.01      0.0267      0.07  Q         .         .         .         .
  5.38      0.0289      0.07  Q         .         .         .         .
  5.74      0.0312      0.08  Q         .         .         .         .
  6.11      0.0335      0.08  Q         .         .         .         .
  6.48      0.0359      0.08  Q         .         .         .         .
  6.84      0.0383      0.08  Q         .         .         .         .
  7.21      0.0408      0.08  Q         .         .         .         .
  7.57      0.0433      0.09  Q         .         .         .         .
```

7.94	0.0459	0.09	Q	.	.	.	.
8.31	0.0486	0.09	Q	.	.	.	.
8.67	0.0513	0.09	Q	.	.	.	.
9.04	0.0541	0.09	Q	.	.	.	.
9.41	0.0570	0.10	Q	.	.	.	.
9.77	0.0600	0.10	Q	.	.	.	.
10.14	0.0631	0.10	Q	.	.	.	.
10.51	0.0662	0.11	Q	.	.	.	.
10.87	0.0695	0.11	Q	.	.	.	.
11.24	0.0729	0.12	Q	.	.	.	.
11.60	0.0765	0.12	Q	.	.	.	.
11.97	0.0802	0.13	Q	.	.	.	.
12.34	0.0843	0.14	Q	.	.	.	.
12.70	0.0889	0.17	Q	.	.	.	.
13.07	0.0941	0.17	Q	.	.	.	.
13.44	0.0995	0.19	Q	.	.	.	.
13.80	0.1053	0.19	Q	.	.	.	.
14.17	0.1115	0.22	Q	.	.	.	.
14.53	0.1182	0.23	Q	.	.	.	.
14.90	0.1256	0.26	.Q	.	.	.	.
15.27	0.1340	0.29	.Q	.	.	.	.
15.63	0.1444	0.39	.Q	.	.	.	.
16.00	0.1580	0.50	. Q	.	.	.	.
16.37	0.2120	3.06	.	. Q	.	.	.
16.73	0.2633	0.33	.Q	.	.	.	.
17.10	0.2720	0.24	Q	.	.	.	.
17.47	0.2788	0.20	Q	.	.	.	.
17.83	0.2846	0.18	Q	.	.	.	.
18.20	0.2897	0.16	Q	.	.	.	.
18.56	0.2941	0.12	Q	.	.	.	.
18.93	0.2976	0.11	Q	.	.	.	.
19.30	0.3009	0.10	Q	.	.	.	.
19.66	0.3040	0.10	Q	.	.	.	.
20.03	0.3069	0.09	Q	.	.	.	.
20.40	0.3096	0.09	Q	.	.	.	.
20.76	0.3122	0.08	Q	.	.	.	.
21.13	0.3147	0.08	Q	.	.	.	.
21.49	0.3171	0.08	Q	.	.	.	.
21.86	0.3194	0.07	Q	.	.	.	.
22.23	0.3216	0.07	Q	.	.	.	.
22.59	0.3237	0.07	Q	.	.	.	.
22.96	0.3257	0.07	Q	.	.	.	.
23.33	0.3277	0.06	Q	.	.	.	.
23.69	0.3297	0.06	Q	.	.	.	.
24.06	0.3315	0.06	Q	.	.	.	.
24.43	0.3325	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%	1450.7
10%	87.9
20%	22.0
30%	22.0
40%	22.0
50%	22.0
60%	22.0
70%	22.0
80%	22.0
90%	22.0

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A3
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   26.66
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 11.65
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.50
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     4.92

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.08      0.0000      0.00  Q         .         .         .         .
  0.27      0.0006      0.08  Q         .         .         .         .
  0.47      0.0019      0.08  Q         .         .         .         .
  0.66      0.0032      0.08  Q         .         .         .         .
  0.86      0.0044      0.08  Q         .         .         .         .
  1.05      0.0057      0.08  Q         .         .         .         .
  1.24      0.0070      0.08  Q         .         .         .         .
  1.44      0.0083      0.08  Q         .         .         .         .
  1.63      0.0096      0.08  Q         .         .         .         .
  1.83      0.0110      0.08  Q         .         .         .         .
  2.02      0.0123      0.08  Q         .         .         .         .
  2.21      0.0136      0.08  Q         .         .         .         .
  2.41      0.0150      0.08  Q         .         .         .         .
  2.60      0.0164      0.09  Q         .         .         .         .
  2.80      0.0177      0.09  Q         .         .         .         .
  2.99      0.0191      0.09  Q         .         .         .         .
  3.19      0.0205      0.09  Q         .         .         .         .
  3.38      0.0220      0.09  Q         .         .         .         .
  3.57      0.0234      0.09  Q         .         .         .         .
  3.77      0.0248      0.09  Q         .         .         .         .
  3.96      0.0263      0.09  Q         .         .         .         .
```

4.16	0.0277	0.09	Q	.	.	.	.
4.35	0.0292	0.09	Q	.	.	.	.
4.54	0.0307	0.09	Q	.	.	.	.
4.74	0.0322	0.09	Q	.	.	.	.
4.93	0.0337	0.10	Q	.	.	.	.
5.13	0.0353	0.10	Q	.	.	.	.
5.32	0.0368	0.10	Q	.	.	.	.
5.52	0.0384	0.10	Q	.	.	.	.
5.71	0.0400	0.10	Q	.	.	.	.
5.90	0.0415	0.10	Q	.	.	.	.
6.10	0.0432	0.10	Q	.	.	.	.
6.29	0.0448	0.10	Q	.	.	.	.
6.49	0.0464	0.10	Q	.	.	.	.
6.68	0.0481	0.10	Q	.	.	.	.
6.87	0.0498	0.11	Q	.	.	.	.
7.07	0.0515	0.11	Q	.	.	.	.
7.26	0.0532	0.11	Q	.	.	.	.
7.46	0.0550	0.11	Q	.	.	.	.
7.65	0.0568	0.11	Q	.	.	.	.
7.85	0.0586	0.11	Q	.	.	.	.
8.04	0.0604	0.11	Q	.	.	.	.
8.23	0.0622	0.12	Q	.	.	.	.
8.43	0.0641	0.12	Q	.	.	.	.
8.62	0.0660	0.12	Q	.	.	.	.
8.82	0.0679	0.12	Q	.	.	.	.
9.01	0.0699	0.12	Q	.	.	.	.
9.20	0.0718	0.12	Q	.	.	.	.
9.40	0.0739	0.13	Q	.	.	.	.
9.59	0.0759	0.13	Q	.	.	.	.
9.79	0.0780	0.13	Q	.	.	.	.
9.98	0.0801	0.13	Q	.	.	.	.
10.18	0.0823	0.14	Q	.	.	.	.
10.37	0.0845	0.14	Q	.	.	.	.
10.56	0.0867	0.14	Q	.	.	.	.
10.76	0.0890	0.14	Q	.	.	.	.
10.95	0.0913	0.15	Q	.	.	.	.
11.15	0.0937	0.15	Q	.	.	.	.
11.34	0.0961	0.15	Q	.	.	.	.
11.53	0.0986	0.16	Q	.	.	.	.
11.73	0.1011	0.16	Q	.	.	.	.
11.92	0.1037	0.17	Q	.	.	.	.
12.12	0.1064	0.17	Q	.	.	.	.
12.31	0.1094	0.21	Q	.	.	.	.
12.51	0.1128	0.21	Q	.	.	.	.
12.70	0.1163	0.22	Q	.	.	.	.
12.89	0.1198	0.22	Q	.	.	.	.
13.09	0.1235	0.23	Q	.	.	.	.
13.28	0.1272	0.24	Q	.	.	.	.
13.48	0.1311	0.25	Q	.	.	.	.
13.67	0.1352	0.25	Q	.	.	.	.
13.86	0.1393	0.27	Q	.	.	.	.
14.06	0.1437	0.27	Q	.	.	.	.
14.25	0.1482	0.29	Q	.	.	.	.
14.45	0.1530	0.30	Q	.	.	.	.
14.64	0.1580	0.32	Q	.	.	.	.
14.84	0.1633	0.34	Q	.	.	.	.
15.03	0.1690	0.37	Q	.	.	.	.
15.22	0.1752	0.40	Q	.	.	.	.
15.42	0.1821	0.46	Q	.	.	.	.
15.61	0.1900	0.52	.Q	.	.	.	.
15.81	0.1997	0.68	.Q	.	.	.	.
16.00	0.2122	0.87	.Q	.	.	.	.
16.19	0.3066	10.90	.	.	.Q	.	.
16.39	0.3988	0.59	.Q	.	.	.	.
16.58	0.4070	0.43	Q	.	.	.	.
16.78	0.4132	0.36	Q	.	.	.	.
16.97	0.4186	0.31	Q	.	.	.	.
17.17	0.4233	0.28	Q	.	.	.	.
17.36	0.4277	0.26	Q	.	.	.	.

17.55	0.4317	0.24	Q	.	.	.	.
17.75	0.4355	0.23	Q	.	.	.	.
17.94	0.4391	0.22	Q	.	.	.	.
18.14	0.4424	0.20	Q	.	.	.	.
18.33	0.4453	0.16	Q	.	.	.	.
18.52	0.4479	0.15	Q	.	.	.	.
18.72	0.4503	0.15	Q	.	.	.	.
18.91	0.4526	0.14	Q	.	.	.	.
19.11	0.4549	0.14	Q	.	.	.	.
19.30	0.4570	0.13	Q	.	.	.	.
19.49	0.4591	0.13	Q	.	.	.	.
19.69	0.4611	0.12	Q	.	.	.	.
19.88	0.4631	0.12	Q	.	.	.	.
20.08	0.4650	0.12	Q	.	.	.	.
20.27	0.4668	0.11	Q	.	.	.	.
20.47	0.4686	0.11	Q	.	.	.	.
20.66	0.4704	0.11	Q	.	.	.	.
20.85	0.4721	0.11	Q	.	.	.	.
21.05	0.4737	0.10	Q	.	.	.	.
21.24	0.4754	0.10	Q	.	.	.	.
21.44	0.4770	0.10	Q	.	.	.	.
21.63	0.4785	0.10	Q	.	.	.	.
21.83	0.4801	0.09	Q	.	.	.	.
22.02	0.4816	0.09	Q	.	.	.	.
22.21	0.4830	0.09	Q	.	.	.	.
22.41	0.4845	0.09	Q	.	.	.	.
22.60	0.4859	0.09	Q	.	.	.	.
22.80	0.4873	0.09	Q	.	.	.	.
22.99	0.4887	0.09	Q	.	.	.	.
23.18	0.4901	0.08	Q	.	.	.	.
23.38	0.4914	0.08	Q	.	.	.	.
23.57	0.4927	0.08	Q	.	.	.	.
23.77	0.4940	0.08	Q	.	.	.	.
23.96	0.4953	0.08	Q	.	.	.	.
24.15	0.4965	0.08	Q	.	.	.	.
24.35	0.4972	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%	1444.6
10%	11.6
20%	11.6
30%	11.6
40%	11.6
50%	11.6
60%	11.6
70%	11.6
80%	11.6
90%	11.6

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*****************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
=============================================================================
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                              Analysis prepared by:

                         Kimley-Horn and Associates, Inc.
                                765 The City Drive
                                    Suite 200
                                 Orange, CA 92868

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

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A4
-----------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   48.40
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 20.28
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.81
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     9.03

*****************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
-----------------------------------------------------------------------------
  0.11      0.0007      0.14  Q         .         .         .         .
  0.45      0.0046      0.14  Q         .         .         .         .
  0.79      0.0086      0.14  Q         .         .         .         .
  1.13      0.0127      0.15  Q         .         .         .         .
  1.47      0.0168      0.15  Q         .         .         .         .
  1.80      0.0209      0.15  Q         .         .         .         .
  2.14      0.0252      0.15  Q         .         .         .         .
  2.48      0.0294      0.15  Q         .         .         .         .
  2.82      0.0337      0.16  Q         .         .         .         .
  3.16      0.0381      0.16  Q         .         .         .         .
  3.49      0.0426      0.16  Q         .         .         .         .
  3.83      0.0471      0.16  Q         .         .         .         .
  4.17      0.0517      0.17  Q         .         .         .         .
  4.51      0.0563      0.17  Q         .         .         .         .
  4.85      0.0611      0.17  Q         .         .         .         .
  5.18      0.0659      0.17  Q         .         .         .         .
  5.52      0.0708      0.18  Q         .         .         .         .
  5.86      0.0758      0.18  Q         .         .         .         .
  6.20      0.0809      0.18  Q         .         .         .         .
  6.54      0.0860      0.19  Q         .         .         .         .
  6.87      0.0913      0.19  Q         .         .         .         .
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  7.21      0.0967      0.19  Q         .         .         .         .
  7.55      0.1022      0.20  Q         .         .         .         .
  7.89      0.1078      0.20  Q         .         .         .         .
  8.23      0.1136      0.21  Q         .         .         .         .
  8.56      0.1194      0.21  Q         .         .         .         .
  8.90      0.1255      0.22  Q         .         .         .         .
  9.24      0.1317      0.22  Q         .         .         .         .
  9.58      0.1380      0.23  Q         .         .         .         .
  9.92      0.1446      0.24  Q         .         .         .         .
 10.25      0.1513      0.25  Q         .         .         .         .
 10.59      0.1583      0.25  .Q        .         .         .         .
 10.93      0.1655      0.26  .Q        .         .         .         .
 11.27      0.1729      0.27  .Q        .         .         .         .
 11.61      0.1807      0.28  .Q        .         .         .         .
 11.94      0.1887      0.29  .Q        .         .         .         .
 12.28      0.1978      0.36  .Q        .         .         .         .
 12.62      0.2082      0.38  .Q        .         .         .         .
 12.96      0.2192      0.41  .Q        .         .         .         .
 13.30      0.2308      0.42  .Q        .         .         .         .
 13.63      0.2430      0.46  .Q        .         .         .         .
 13.97      0.2560      0.48  .Q        .         .         .         .
 14.31      0.2700      0.52  . Q       .         .         .         .
 14.65      0.2850      0.55  . Q       .         .         .         .
 14.99      0.3017      0.64  . Q       .         .         .         .
 15.32      0.3206      0.71  . Q       .         .         .         .
 15.66      0.3440      0.97  .  Q      .         .         .         .
 16.00      0.3746      1.23  .   Q     .         .         .         .
 16.34      0.5117      8.59  .         .         .         .   Q     .
 16.68      0.6429      0.80  .  Q      .         .         .         .
 17.01      0.6623      0.59  . Q       .         .         .         .
 17.35      0.6776      0.50  .Q        .         .         .         .
 17.69      0.6906      0.44  .Q        .         .         .         .
 18.03      0.7023      0.40  .Q        .         .         .         .
 18.37      0.7120      0.30  .Q        .         .         .         .
 18.70      0.7201      0.28  .Q        .         .         .         .
 19.04      0.7275      0.26  .Q        .         .         .         .
 19.38      0.7345      0.24  Q         .         .         .         .
 19.72      0.7410      0.23  Q         .         .         .         .
 20.06      0.7472      0.22  Q         .         .         .         .
 20.39      0.7531      0.21  Q         .         .         .         .
 20.73      0.7588      0.20  Q         .         .         .         .
 21.07      0.7641      0.19  Q         .         .         .         .
 21.41      0.7693      0.18  Q         .         .         .         .
 21.75      0.7743      0.18  Q         .         .         .         .
 22.08      0.7791      0.17  Q         .         .         .         .
 22.42      0.7838      0.16  Q         .         .         .         .
 22.76      0.7883      0.16  Q         .         .         .         .
 23.10      0.7927      0.15  Q         .         .         .         .
 23.44      0.7970      0.15  Q         .         .         .         .
 23.77      0.8011      0.15  Q         .         .         .         .
 24.11      0.8052      0.14  Q         .         .         .         .
 24.45      0.8072      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               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
               0%                         1460.2
              10%                           60.8
              20%                           20.3
              30%                           20.3
              40%                           20.3
              50%                           20.3
              60%                           20.3
              70%                           20.3
```

80%	20.3
90%	20.3

```
******************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A5
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   85.66
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 51.46
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.14
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    16.28

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.56      0.0000      0.00  Q         .         .         .         .
  1.42      0.0092      0.26  .Q        .         .         .         .
  2.28      0.0277      0.26  .Q        .         .         .         .
  3.13      0.0468      0.28  .Q        .         .         .         .
  3.99      0.0666      0.28  .Q        .         .         .         .
  4.85      0.0872      0.30  .Q        .         .         .         .
  5.71      0.1087      0.31  .Q        .         .         .         .
  6.57      0.1311      0.33  .Q        .         .         .         .
  7.42      0.1546      0.34  .Q        .         .         .         .
  8.28      0.1794      0.36  .Q        .         .         .         .
  9.14      0.2057      0.38  .Q        .         .         .         .
 10.00      0.2337      0.41  .Q        .         .         .         .
 10.85      0.2637      0.43  .Q        .         .         .         .
 11.71      0.2965      0.49  .Q        .         .         .         .
 12.57      0.3324      0.53  . Q       .         .         .         .
 13.43      0.3771      0.74  . Q       .         .         .         .
 14.28      0.4319      0.81  .  Q      .         .         .         .
 15.14      0.4984      1.07  .   Q     .         .         .         .
 16.00      0.5852      1.38  .    Q    .         .         .         .
 16.86      0.7457      3.15  .         . Q       .         .         .
 17.72      0.8895      0.91  .  Q      .         .         .         .
```

```
  18.57      0.9458      0.68  . Q       .         .         .         .
  19.43      0.9861      0.46  .Q        .         .         .         .
  20.29      1.0164      0.39  .Q        .         .         .         .
  21.15      1.0427      0.35  .Q        .         .         .         .
  22.00      1.0663      0.32  .Q        .         .         .         .
  22.86      1.0878      0.29  .Q        .         .         .         .
  23.72      1.1077      0.27  .Q        .         .         .         .
  24.58      1.1262      0.25  .Q        .         .         .         .
  25.43      1.1352      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1440.9
              10%                            977.7
              20%                            360.2
              30%                            154.4
              40%                            102.9
              50%                             51.5
              60%                             51.5
              70%                             51.5
              80%                             51.5
              90%                             51.5
```

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A6
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   89.75
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 27.74
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.27
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    16.98

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.28      0.0000      0.00  Q         .         .         .         .
  0.74      0.0051      0.27  .Q        .         .         .         .
  1.21      0.0153      0.27  .Q        .         .         .         .
  1.67      0.0258      0.28  .Q        .         .         .         .
  2.13      0.0364      0.28  .Q        .         .         .         .
  2.59      0.0472      0.29  .Q        .         .         .         .
  3.05      0.0582      0.29  .Q        .         .         .         .
  3.52      0.0694      0.30  .Q        .         .         .         .
  3.98      0.0808      0.30  .Q        .         .         .         .
  4.44      0.0925      0.31  .Q        .         .         .         .
  4.90      0.1045      0.32  .Q        .         .         .         .
  5.37      0.1167      0.32  .Q        .         .         .         .
  5.83      0.1292      0.33  .Q        .         .         .         .
  6.29      0.1421      0.34  .Q        .         .         .         .
  6.75      0.1552      0.35  .Q        .         .         .         .
  7.22      0.1687      0.36  .Q        .         .         .         .
  7.68      0.1827      0.37  .Q        .         .         .         .
  8.14      0.1970      0.38  .Q        .         .         .         .
  8.60      0.2118      0.39  .Q        .         .         .         .
  9.07      0.2271      0.41  .Q        .         .         .         .
  9.53      0.2429      0.42  .Q        .         .         .         .
```

```
 9.99      0.2594      0.44  .Q       .        .        .        .
10.45      0.2766      0.46  .Q       .        .        .        .
10.91      0.2945      0.48  .Q       .        .        .        .
11.38      0.3133      0.50  .Q       .        .        .        .
11.84      0.3331      0.54  . Q      .        .        .        .
12.30      0.3541      0.56  . Q      .        .        .        .
12.76      0.3787      0.73  . Q      .        .        .        .
13.23      0.4071      0.76  .  Q     .        .        .        .
13.69      0.4376      0.84  .  Q     .        .        .        .
14.15      0.4707      0.89  .  Q     .        .        .        .
14.61      0.5074      1.03  .   Q    .        .        .        .
15.08      0.5486      1.13  .   Q    .        .        .        .
15.54      0.5990      1.51  .     Q  .        .        .        .
16.00      0.6656      1.98  .      Q .        .        .        .
16.46      0.8253      6.38  .        .        .    Q   .        .
16.92      0.9715      1.28  .    Q   .        .        .        .
17.39      1.0140      0.95  .  Q     .        .        .        .
17.85      1.0474      0.80  .  Q     .        .        .        .
18.31      1.0759      0.70  . Q      .        .        .        .
18.77      1.0991      0.52  . Q      .        .        .        .
19.24      1.1180      0.47  .Q       .        .        .        .
19.70      1.1352      0.43  .Q       .        .        .        .
20.16      1.1510      0.40  .Q       .        .        .        .
20.62      1.1658      0.38  .Q       .        .        .        .
21.09      1.1798      0.35  .Q       .        .        .        .
21.55      1.1929      0.34  .Q       .        .        .        .
22.01      1.2055      0.32  .Q       .        .        .        .
22.47      1.2174      0.31  .Q       .        .        .        .
22.93      1.2289      0.29  .Q       .        .        .        .
23.40      1.2399      0.28  .Q       .        .        .        .
23.86      1.2505      0.27  .Q       .        .        .        .
24.32      1.2607      0.26  .Q       .        .        .        .
24.78      1.2658      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1442.5
              10%                            360.6
              20%                            111.0
              30%                             55.5
              40%                             27.7
              50%                             27.7
              60%                             27.7
              70%                             27.7
              80%                             27.7
              90%                             27.7
```

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 2-YEAR STORM EVENT, DA A7
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   42.02
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 14.79
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.76
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     7.78

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.22      0.0013      0.12  Q         .         .         .         .
  0.47      0.0038      0.12  Q         .         .         .         .
  0.72      0.0063      0.12  Q         .         .         .         .
  0.96      0.0089      0.13  Q         .         .         .         .
  1.21      0.0115      0.13  Q         .         .         .         .
  1.46      0.0141      0.13  Q         .         .         .         .
  1.70      0.0167      0.13  Q         .         .         .         .
  1.95      0.0194      0.13  Q         .         .         .         .
  2.20      0.0220      0.13  Q         .         .         .         .
  2.44      0.0247      0.13  Q         .         .         .         .
  2.69      0.0275      0.13  Q         .         .         .         .
  2.94      0.0303      0.14  Q         .         .         .         .
  3.18      0.0330      0.14  Q         .         .         .         .
  3.43      0.0359      0.14  Q         .         .         .         .
  3.67      0.0387      0.14  Q         .         .         .         .
  3.92      0.0416      0.14  Q         .         .         .         .
  4.17      0.0445      0.14  Q         .         .         .         .
  4.41      0.0475      0.15  Q         .         .         .         .
  4.66      0.0505      0.15  Q         .         .         .         .
  4.91      0.0535      0.15  Q         .         .         .         .
  5.15      0.0566      0.15  Q         .         .         .         .
```

5.40	0.0597	0.15	Q	.	.	.	.
5.65	0.0628	0.15	Q	.	.	.	.
5.89	0.0660	0.16	Q	.	.	.	.
6.14	0.0692	0.16	Q	.	.	.	.
6.39	0.0725	0.16	Q	.	.	.	.
6.63	0.0758	0.16	Q	.	.	.	.
6.88	0.0792	0.17	Q	.	.	.	.
7.13	0.0826	0.17	Q	.	.	.	.
7.37	0.0861	0.17	Q	.	.	.	.
7.62	0.0896	0.17	Q	.	.	.	.
7.87	0.0932	0.18	Q	.	.	.	.
8.11	0.0968	0.18	Q	.	.	.	.
8.36	0.1005	0.18	Q	.	.	.	.
8.60	0.1043	0.19	Q	.	.	.	.
8.85	0.1081	0.19	Q	.	.	.	.
9.10	0.1120	0.19	Q	.	.	.	.
9.34	0.1160	0.20	Q	.	.	.	.
9.59	0.1201	0.20	Q	.	.	.	.
9.84	0.1242	0.21	Q	.	.	.	.
10.08	0.1285	0.21	Q	.	.	.	.
10.33	0.1328	0.22	Q	.	.	.	.
10.58	0.1373	0.22	Q	.	.	.	.
10.82	0.1419	0.23	Q	.	.	.	.
11.07	0.1465	0.23	Q	.	.	.	.
11.32	0.1513	0.24	Q	.	.	.	.
11.56	0.1563	0.25	Q	.	.	.	.
11.81	0.1614	0.26	Q	.	.	.	.
12.06	0.1666	0.26	Q	.	.	.	.
12.30	0.1726	0.33	Q	.	.	.	.
12.55	0.1794	0.33	Q	.	.	.	.
12.80	0.1863	0.35	Q	.	.	.	.
13.04	0.1935	0.36	Q	.	.	.	.
13.29	0.2010	0.38	Q	.	.	.	.
13.53	0.2088	0.39	Q	.	.	.	.
13.78	0.2169	0.41	Q	.	.	.	.
14.03	0.2254	0.43	Q	.	.	.	.
14.27	0.2344	0.46	Q	.	.	.	.
14.52	0.2439	0.48	Q	.	.	.	.
14.77	0.2541	0.53	.Q	.	.	.	.
15.01	0.2651	0.56	.Q	.	.	.	.
15.26	0.2775	0.65	.Q	.	.	.	.
15.51	0.2914	0.72	.Q	.	.	.	.
15.75	0.3085	0.97	.Q	.	.	.	.
16.00	0.3309	1.23	. Q	.	.	.	.
16.25	0.4726	12.69	.	.	.	Q	.
16.49	0.6103	0.83	.Q	.	.	.	.
16.74	0.6248	0.60	.Q	.	.	.	.
16.99	0.6360	0.50	Q	.	.	.	.
17.23	0.6456	0.44	Q	.	.	.	.
17.48	0.6541	0.40	Q	.	.	.	.
17.73	0.6619	0.37	Q	.	.	.	.
17.97	0.6691	0.34	Q	.	.	.	.
18.22	0.6755	0.29	Q	.	.	.	.
18.47	0.6810	0.25	Q	.	.	.	.
18.71	0.6859	0.24	Q	.	.	.	.
18.96	0.6906	0.22	Q	.	.	.	.
19.20	0.6951	0.21	Q	.	.	.	.
19.45	0.6993	0.20	Q	.	.	.	.
19.70	0.7034	0.20	Q	.	.	.	.
19.94	0.7073	0.19	Q	.	.	.	.
20.19	0.7111	0.18	Q	.	.	.	.
20.44	0.7147	0.18	Q	.	.	.	.
20.68	0.7182	0.17	Q	.	.	.	.
20.93	0.7217	0.17	Q	.	.	.	.
21.18	0.7250	0.16	Q	.	.	.	.
21.42	0.7282	0.16	Q	.	.	.	.
21.67	0.7313	0.15	Q	.	.	.	.
21.92	0.7344	0.15	Q	.	.	.	.
22.16	0.7374	0.15	Q	.	.	.	.

```
  22.41      0.7403      0.14  Q         .         .         .         .
  22.66      0.7432      0.14  Q         .         .         .         .
  22.90      0.7460      0.14  Q         .         .         .         .
  23.15      0.7487      0.13  Q         .         .         .         .
  23.39      0.7514      0.13  Q         .         .         .         .
  23.64      0.7540      0.13  Q         .         .         .         .
  23.89      0.7566      0.13  Q         .         .         .         .
  24.13      0.7591      0.12  Q         .         .         .         .
  24.38      0.7604      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               Duration
        Peak Flow Rate                    (minutes)
    ======================                =========
               0%                          1449.4
              10%                            14.8
              20%                            14.8
              30%                            14.8
              40%                            14.8
              50%                            14.8
              60%                            14.8
              70%                            14.8
              80%                            14.8
              90%                            14.8
```

Appendix I.II

Synthetic Unit Hydrograph Method Analysis
Pre-Development Conditions
100-Year Storm

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******************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A1
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   10.89
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) =  9.83
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     4.10
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.19

******************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.11      0.0041      0.91  .Q        .         .         .         .
  0.27      0.0164      0.91  .Q        .         .         .         .
  0.44      0.0288      0.92  .Q        .         .         .         .
  0.60      0.0413      0.92  .Q        .         .         .         .
  0.76      0.0538      0.93  .Q        .         .         .         .
  0.93      0.0665      0.93  .Q        .         .         .         .
  1.09      0.0792      0.94  .Q        .         .         .         .
  1.25      0.0919      0.95  .Q        .         .         .         .
  1.42      0.1048      0.95  .Q        .         .         .         .
  1.58      0.1177      0.96  .Q        .         .         .         .
  1.75      0.1308      0.97  .Q        .         .         .         .
  1.91      0.1439      0.97  .Q        .         .         .         .
  2.07      0.1570      0.98  .Q        .         .         .         .
  2.24      0.1703      0.98  .Q        .         .         .         .
  2.40      0.1837      0.99  .Q        .         .         .         .
  2.57      0.1971      1.00  .Q        .         .         .         .
  2.73      0.2107      1.00  .Q        .         .         .         .
  2.89      0.2243      1.01  .Q        .         .         .         .
  3.06      0.2380      1.02  .Q        .         .         .         .
  3.22      0.2518      1.02  .Q        .         .         .         .
  3.38      0.2657      1.03  .Q        .         .         .         .
```

3.55	0.2798	1.04	.Q	.	.	.	.
3.71	0.2939	1.05	.Q	.	.	.	.
3.88	0.3081	1.05	.Q	.	.	.	.
4.04	0.3224	1.06	.Q	.	.	.	.
4.20	0.3369	1.07	.Q	.	.	.	.
4.37	0.3514	1.08	.Q	.	.	.	.
4.53	0.3661	1.09	.Q	.	.	.	.
4.70	0.3808	1.10	.Q	.	.	.	.
4.86	0.3957	1.10	.Q	.	.	.	.
5.02	0.4108	1.11	.Q	.	.	.	.
5.19	0.4259	1.12	.Q	.	.	.	.
5.35	0.4412	1.13	.Q	.	.	.	.
5.51	0.4566	1.14	.Q	.	.	.	.
5.68	0.4721	1.15	.Q	.	.	.	.
5.84	0.4877	1.16	.Q	.	.	.	.
6.01	0.5035	1.17	.Q	.	.	.	.
6.17	0.5195	1.18	.Q	.	.	.	.
6.33	0.5356	1.20	.Q	.	.	.	.
6.50	0.5518	1.20	.Q	.	.	.	.
6.66	0.5682	1.22	.Q	.	.	.	.
6.83	0.5848	1.23	.Q	.	.	.	.
6.99	0.6015	1.24	.Q	.	.	.	.
7.15	0.6184	1.25	.Q	.	.	.	.
7.32	0.6354	1.27	.Q	.	.	.	.
7.48	0.6527	1.28	.Q	.	.	.	.
7.64	0.6701	1.30	.Q	.	.	.	.
7.81	0.6877	1.30	.Q	.	.	.	.
7.97	0.7055	1.32	.Q	.	.	.	.
8.14	0.7235	1.33	.Q	.	.	.	.
8.30	0.7417	1.35	.Q	.	.	.	.
8.46	0.7601	1.37	.Q	.	.	.	.
8.63	0.7787	1.39	.Q	.	.	.	.
8.79	0.7976	1.40	.Q	.	.	.	.
8.96	0.8167	1.42	.Q	.	.	.	.
9.12	0.8360	1.43	.Q	.	.	.	.
9.28	0.8556	1.46	.Q	.	.	.	.
9.45	0.8755	1.47	.Q	.	.	.	.
9.61	0.8956	1.50	. Q	.	.	.	.
9.77	0.9160	1.51	. Q	.	.	.	.
9.94	0.9367	1.54	. Q	.	.	.	.
10.10	0.9578	1.56	. Q	.	.	.	.
10.27	0.9791	1.59	. Q	.	.	.	.
10.43	1.0008	1.61	. Q	.	.	.	.
10.59	1.0228	1.64	. Q	.	.	.	.
10.76	1.0452	1.66	. Q	.	.	.	.
10.92	1.0679	1.70	. Q	.	.	.	.
11.09	1.0911	1.72	. Q	.	.	.	.
11.25	1.1147	1.76	. Q	.	.	.	.
11.41	1.1387	1.79	. Q	.	.	.	.
11.58	1.1632	1.83	. Q	.	.	.	.
11.74	1.1882	1.86	. Q	.	.	.	.
11.90	1.2137	1.91	. Q	.	.	.	.
12.07	1.2398	1.94	. Q	.	.	.	.
12.23	1.2679	2.21	. Q	.	.	.	.
12.40	1.2980	2.24	. Q	.	.	.	.
12.56	1.3289	2.31	. Q	.	.	.	.
12.72	1.3604	2.35	. Q	.	.	.	.
12.89	1.3928	2.43	. Q	.	.	.	.
13.05	1.4260	2.47	. Q	.	.	.	.
13.21	1.4601	2.57	. Q	.	.	.	.
13.38	1.4952	2.62	. Q	.	.	.	.
13.54	1.5314	2.73	. Q	.	.	.	.
13.71	1.5687	2.79	. Q	.	.	.	.
13.87	1.6074	2.92	. Q	.	.	.	.
14.03	1.6474	3.00	. Q	.	.	.	.
14.20	1.6879	2.97	. Q	.	.	.	.
14.36	1.7288	3.07	. Q	.	.	.	.
14.53	1.7718	3.29	. Q	.	.	.	.
14.69	1.8172	3.42	. Q	.	.	.	.

```
  14.85      1.8656      3.73  .   Q     .         .         .         .
  15.02      1.9174      3.92  .    Q    .         .         .         .
  15.18      1.9736      4.39  .    Q    .         .         .         .
  15.34      2.0351      4.70  .     Q   .         .         .         .
  15.51      2.1103      6.41  .       Q .         .         .         .
  15.67      2.2013      7.04  .        Q.         .         .         .
  15.84      2.3111      9.18  .         . Q       .         .         .
  16.00      2.4541     11.93  .         .    Q    .         .         .
  16.16      2.7315     29.06  .         .         .         .       Q .
  16.33      2.9818      7.91  .         Q         .         .         .
  16.49      3.0703      5.16  .     Q   .         .         .         .
  16.66      3.1332      4.13  .    Q    .         .         .         .
  16.82      3.1853      3.56  .   Q     .         .         .         .
  16.98      3.2310      3.17  .   Q     .         .         .         .
  17.15      3.2729      3.02  .   Q     .         .         .         .
  17.31      3.3126      2.85  .  Q      .         .         .         .
  17.47      3.3500      2.67  .  Q      .         .         .         .
  17.64      3.3852      2.52  .  Q      .         .         .         .
  17.80      3.4184      2.39  .  Q      .         .         .         .
  17.97      3.4500      2.28  .  Q      .         .         .         .
  18.13      3.4796      2.10  . Q       .         .         .         .
  18.29      3.5066      1.88  . Q       .         .         .         .
  18.46      3.5316      1.81  . Q       .         .         .         .
  18.62      3.5556      1.74  . Q       .         .         .         .
  18.79      3.5788      1.68  . Q       .         .         .         .
  18.95      3.6012      1.63  . Q       .         .         .         .
  19.11      3.6228      1.58  . Q       .         .         .         .
  19.28      3.6439      1.53  . Q       .         .         .         .
  19.44      3.6643      1.49  .Q        .         .         .         .
  19.60      3.6841      1.45  .Q        .         .         .         .
  19.77      3.7035      1.41  .Q        .         .         .         .
  19.93      3.7224      1.38  .Q        .         .         .         .
  20.10      3.7408      1.34  .Q        .         .         .         .
  20.26      3.7588      1.31  .Q        .         .         .         .
  20.42      3.7764      1.29  .Q        .         .         .         .
  20.59      3.7936      1.26  .Q        .         .         .         .
  20.75      3.8105      1.23  .Q        .         .         .         .
  20.92      3.8271      1.21  .Q        .         .         .         .
  21.08      3.8433      1.19  .Q        .         .         .         .
  21.24      3.8592      1.17  .Q        .         .         .         .
  21.41      3.8749      1.15  .Q        .         .         .         .
  21.57      3.8903      1.13  .Q        .         .         .         .
  21.73      3.9054      1.11  .Q        .         .         .         .
  21.90      3.9203      1.09  .Q        .         .         .         .
  22.06      3.9350      1.07  .Q        .         .         .         .
  22.23      3.9494      1.06  .Q        .         .         .         .
  22.39      3.9637      1.04  .Q        .         .         .         .
  22.55      3.9777      1.03  .Q        .         .         .         .
  22.72      3.9915      1.01  .Q        .         .         .         .
  22.88      4.0051      1.00  .Q        .         .         .         .
  23.04      4.0186      0.99  .Q        .         .         .         .
  23.21      4.0318      0.97  .Q        .         .         .         .
  23.37      4.0449      0.96  .Q        .         .         .         .
  23.54      4.0579      0.95  .Q        .         .         .         .
  23.70      4.0707      0.94  .Q        .         .         .         .
  23.86      4.0833      0.93  .Q        .         .         .         .
  24.03      4.0958      0.92  .Q        .         .         .         .
  24.19      4.1020      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
              0%                            1445.0
             10%                             206.4
```

20%	59.0
30%	29.5
40%	19.7
50%	9.8
60%	9.8
70%	9.8
80%	9.8
90%	9.8

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A2
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   20.62
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 17.54
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.80
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.22

******************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.21      0.0208      1.72  .Q        .         .         .         .
  0.51      0.0626      1.74  .Q        .         .         .         .
  0.80      0.1048      1.75  .Q        .         .         .         .
  1.09      0.1475      1.78  .Q        .         .         .         .
  1.38      0.1906      1.79  .Q        .         .         .         .
  1.68      0.2342      1.82  .Q        .         .         .         .
  1.97      0.2782      1.83  .Q        .         .         .         .
  2.26      0.3228      1.86  .Q        .         .         .         .
  2.55      0.3679      1.87  .Q        .         .         .         .
  2.84      0.4135      1.90  .Q        .         .         .         .
  3.14      0.4597      1.92  .Q        .         .         .         .
  3.43      0.5065      1.95  .Q        .         .         .         .
  3.72      0.5539      1.97  .Q        .         .         .         .
  4.01      0.6018      2.00  .Q        .         .         .         .
  4.31      0.6505      2.02  .Q        .         .         .         .
  4.60      0.6998      2.06  .Q        .         .         .         .
  4.89      0.7497      2.08  .Q        .         .         .         .
  5.18      0.8004      2.12  .Q        .         .         .         .
  5.48      0.8519      2.14  .Q        .         .         .         .
  5.77      0.9041      2.18  .Q        .         .         .         .
  6.06      0.9572      2.21  .Q        .         .         .         .
```

```
  6.35      1.0111      2.26  .Q        .         .         .         .
  6.65      1.0659      2.28  .Q        .         .         .         .
  6.94      1.1217      2.33  .Q        .         .         .         .
  7.23      1.1784      2.36  .Q        .         .         .         .
  7.52      1.2361      2.42  .Q        .         .         .         .
  7.81      1.2950      2.45  .Q        .         .         .         .
  8.11      1.3550      2.52  . Q       .         .         .         .
  8.40      1.4162      2.55  . Q       .         .         .         .
  8.69      1.4786      2.62  . Q       .         .         .         .
  8.98      1.5425      2.66  . Q       .         .         .         .
  9.28      1.6078      2.74  . Q       .         .         .         .
  9.57      1.6746      2.79  . Q       .         .         .         .
  9.86      1.7431      2.88  . Q       .         .         .         .
 10.15      1.8133      2.93  . Q       .         .         .         .
 10.45      1.8855      3.04  . Q       .         .         .         .
 10.74      1.9597      3.10  . Q       .         .         .         .
 11.03      2.0361      3.23  . Q       .         .         .         .
 11.32      2.1150      3.30  . Q       .         .         .         .
 11.61      2.1965      3.45  . Q       .         .         .         .
 11.91      2.2809      3.54  . Q       .         .         .         .
 12.20      2.3711      3.93  .  Q      .         .         .         .
 12.49      2.4698      4.23  .  Q      .         .         .         .
 12.78      2.5749      4.47  .  Q      .         .         .         .
 13.08      2.6845      4.61  .  Q      .         .         .         .
 13.37      2.7995      4.92  .  Q      .         .         .         .
 13.66      2.9205      5.10  .   Q     .         .         .         .
 13.95      3.0490      5.53  .   Q     .         .         .         .
 14.25      3.1846      5.70  .   Q     .         .         .         .
 14.54      3.3270      6.08  .   Q     .         .         .         .
 14.83      3.4790      6.51  .    Q    .         .         .         .
 15.12      3.6506      7.70  .     Q   .         .         .         .
 15.42      3.8473      8.58  .     Q   .         .         .         .
 15.71      4.1131     13.42  .         Q         .         .         .
 16.00      4.4810     17.04  .         .  Q      .         .         .
 16.29      5.1835     41.12  .         .         .         . Q       .
 16.58      5.8073     10.52  .       Q .         .         .         .
 16.88      6.0193      7.03  .    Q    .         .         .         .
 17.17      6.1735      5.73  .   Q     .         .         .         .
 17.46      6.3067      5.30  .   Q     .         .         .         .
 17.75      6.4282      4.75  .  Q      .         .         .         .
 18.05      6.5381      4.34  .  Q      .         .         .         .
 18.34      6.6344      3.63  . Q       .         .         .         .
 18.63      6.7190      3.37  . Q       .         .         .         .
 18.92      6.7979      3.16  . Q       .         .         .         .
 19.22      6.8722      2.99  . Q       .         .         .         .
 19.51      6.9425      2.83  . Q       .         .         .         .
 19.80      7.0093      2.70  . Q       .         .         .         .
 20.09      7.0732      2.59  . Q       .         .         .         .
 20.39      7.1344      2.48  .Q        .         .         .         .
 20.68      7.1933      2.39  .Q        .         .         .         .
 20.97      7.2500      2.31  .Q        .         .         .         .
 21.26      7.3049      2.23  .Q        .         .         .         .
 21.55      7.3579      2.16  .Q        .         .         .         .
 21.85      7.4094      2.10  .Q        .         .         .         .
 22.14      7.4594      2.04  .Q        .         .         .         .
 22.43      7.5080      1.99  .Q        .         .         .         .
 22.72      7.5554      1.94  .Q        .         .         .         .
 23.02      7.6016      1.89  .Q        .         .         .         .
 23.31      7.6467      1.84  .Q        .         .         .         .
 23.60      7.6908      1.80  .Q        .         .         .         .
 23.89      7.7339      1.77  .Q        .         .         .         .
 24.19      7.7761      1.73  .Q        .         .         .         .
 24.48      7.7970      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%	1455.8
10%	350.8
20%	87.7
30%	52.6
40%	35.1
50%	17.5
60%	17.5
70%	17.5
80%	17.5
90%	17.5

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A3
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   26.66
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) =  9.67
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    10.03
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.92

******************************************************************************
  TIME     VOLUME       Q    0.       20.0      40.0      60.0      80.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.04      0.0000      0.00  Q         .         .         .         .
  0.21      0.0148      2.23  .Q        .         .         .         .
  0.37      0.0447      2.25  .Q        .         .         .         .
  0.53      0.0746      2.25  .Q        .         .         .         .
  0.69      0.1048      2.27  .Q        .         .         .         .
  0.85      0.1351      2.28  .Q        .         .         .         .
  1.01      0.1656      2.30  .Q        .         .         .         .
  1.17      0.1963      2.31  .Q        .         .         .         .
  1.33      0.2272      2.33  .Q        .         .         .         .
  1.50      0.2582      2.34  .Q        .         .         .         .
  1.66      0.2895      2.36  .Q        .         .         .         .
  1.82      0.3209      2.37  .Q        .         .         .         .
  1.98      0.3525      2.39  .Q        .         .         .         .
  2.14      0.3844      2.40  .Q        .         .         .         .
  2.30      0.4164      2.42  .Q        .         .         .         .
  2.46      0.4487      2.43  .Q        .         .         .         .
  2.62      0.4811      2.45  .Q        .         .         .         .
  2.78      0.5138      2.46  .Q        .         .         .         .
  2.95      0.5467      2.48  .Q        .         .         .         .
  3.11      0.5798      2.49  .Q        .         .         .         .
  3.27      0.6132      2.52  .Q        .         .         .         .
```

3.43	0.6468	2.53	.Q	.	.	.	.
3.59	0.6806	2.55	.Q	.	.	.	.
3.75	0.7147	2.56	.Q	.	.	.	.
3.91	0.7490	2.59	.Q	.	.	.	.
4.07	0.7836	2.60	.Q	.	.	.	.
4.23	0.8184	2.63	.Q	.	.	.	.
4.40	0.8535	2.64	.Q	.	.	.	.
4.56	0.8888	2.67	.Q	.	.	.	.
4.72	0.9244	2.68	.Q	.	.	.	.
4.88	0.9604	2.71	.Q	.	.	.	.
5.04	0.9966	2.72	.Q	.	.	.	.
5.20	1.0330	2.75	.Q	.	.	.	.
5.36	1.0698	2.77	.Q	.	.	.	.
5.52	1.1069	2.80	.Q	.	.	.	.
5.69	1.1444	2.82	.Q	.	.	.	.
5.85	1.1821	2.85	.Q	.	.	.	.
6.01	1.2202	2.87	.Q	.	.	.	.
6.17	1.2586	2.90	.Q	.	.	.	.
6.33	1.2973	2.92	.Q	.	.	.	.
6.49	1.3364	2.95	.Q	.	.	.	.
6.65	1.3759	2.97	.Q	.	.	.	.
6.81	1.4157	3.01	.Q	.	.	.	.
6.97	1.4560	3.03	.Q	.	.	.	.
7.14	1.4966	3.07	.Q	.	.	.	.
7.30	1.5376	3.09	.Q	.	.	.	.
7.46	1.5791	3.13	.Q	.	.	.	.
7.62	1.6210	3.16	.Q	.	.	.	.
7.78	1.6633	3.20	.Q	.	.	.	.
7.94	1.7061	3.22	.Q	.	.	.	.
8.10	1.7493	3.27	.Q	.	.	.	.
8.26	1.7931	3.30	.Q	.	.	.	.
8.43	1.8373	3.35	.Q	.	.	.	.
8.59	1.8821	3.37	.Q	.	.	.	.
8.75	1.9274	3.43	.Q	.	.	.	.
8.91	1.9732	3.46	.Q	.	.	.	.
9.07	2.0196	3.51	.Q	.	.	.	.
9.23	2.0666	3.54	.Q	.	.	.	.
9.39	2.1142	3.61	.Q	.	.	.	.
9.55	2.1625	3.64	.Q	.	.	.	.
9.71	2.2114	3.71	.Q	.	.	.	.
9.88	2.2610	3.74	.Q	.	.	.	.
10.04	2.3114	3.81	.Q	.	.	.	.
10.20	2.3624	3.85	.Q	.	.	.	.
10.36	2.4143	3.93	.Q	.	.	.	.
10.52	2.4669	3.97	.Q	.	.	.	.
10.68	2.5205	4.06	. Q	.	.	.	.
10.84	2.5748	4.11	. Q	.	.	.	.
11.00	2.6302	4.20	. Q	.	.	.	.
11.16	2.6865	4.25	. Q	.	.	.	.
11.33	2.7438	4.36	. Q	.	.	.	.
11.49	2.8022	4.41	. Q	.	.	.	.
11.65	2.8617	4.53	. Q	.	.	.	.
11.81	2.9225	4.59	. Q	.	.	.	.
11.97	2.9845	4.72	. Q	.	.	.	.
12.13	3.0486	4.91	. Q	.	.	.	.
12.29	3.1177	5.46	. Q	.	.	.	.
12.45	3.1909	5.54	. Q	.	.	.	.
12.62	3.2658	5.71	. Q	.	.	.	.
12.78	3.3425	5.80	. Q	.	.	.	.
12.94	3.4211	6.00	. Q	.	.	.	.
13.10	3.5016	6.10	. Q	.	.	.	.
13.26	3.5845	6.33	. Q	.	.	.	.
13.42	3.6697	6.46	. Q	.	.	.	.
13.58	3.7575	6.73	. Q	.	.	.	.
13.74	3.8482	6.88	. Q	.	.	.	.
13.90	3.9421	7.22	. Q	.	.	.	.
14.07	4.0394	7.40	. Q	.	.	.	.
14.23	4.1376	7.34	. Q	.	.	.	.
14.39	4.2370	7.58	. Q	.	.	.	.

```
  14.55      4.3416      8.13  .   Q     .         .         .         .
  14.71      4.4520      8.45  .   Q     .         .         .         .
  14.87      4.5695      9.21  .   Q     .         .         .         .
  15.03      4.6953      9.67  .   Q     .         .         .         .
  15.19      4.8319     10.84  .    Q    .         .         .         .
  15.36      4.9814     11.60  .    Q    .         .         .         .
  15.52      5.1639     15.81  .      Q  .         .         .         .
  15.68      5.3848     17.36  .       Q .         .         .         .
  15.84      5.6513     22.65  .         .Q        .         .         .
  16.00      5.9983     29.46  .         .   Q     .         .         .
  16.16      6.6721     71.72  .         .         .         .    Q    .
  16.32      7.2797     19.50  .        Q.         .         .         .
  16.48      7.4958     12.96  .     Q   .         .         .         .
  16.64      7.6502     10.21  .    Q    .         .         .         .
  16.81      7.7768      8.80  .   Q     .         .         .         .
  16.97      7.8876      7.84  .  Q      .         .         .         .
  17.13      7.9885      7.31  .  Q      .         .         .         .
  17.29      8.0841      7.04  .  Q      .         .         .         .
  17.45      8.1749      6.59  .  Q      .         .         .         .
  17.61      8.2602      6.22  .  Q      .         .         .         .
  17.77      8.3408      5.90  . Q       .         .         .         .
  17.93      8.4176      5.62  . Q       .         .         .         .
  18.10      8.4908      5.38  . Q       .         .         .         .
  18.26      8.5577      4.66  . Q       .         .         .         .
  18.42      8.6185      4.47  . Q       .         .         .         .
  18.58      8.6769      4.30  . Q       .         .         .         .
  18.74      8.7332      4.15  . Q       .         .         .         .
  18.90      8.7876      4.02  . Q       .         .         .         .
  19.06      8.8403      3.89  .Q        .         .         .         .
  19.22      8.8914      3.78  .Q        .         .         .         .
  19.38      8.9410      3.67  .Q        .         .         .         .
  19.55      8.9893      3.58  .Q        .         .         .         .
  19.71      9.0363      3.48  .Q        .         .         .         .
  19.87      9.0821      3.40  .Q        .         .         .         .
  20.03      9.1269      3.32  .Q        .         .         .         .
  20.19      9.1706      3.25  .Q        .         .         .         .
  20.35      9.2134      3.18  .Q        .         .         .         .
  20.51      9.2553      3.11  .Q        .         .         .         .
  20.67      9.2963      3.05  .Q        .         .         .         .
  20.83      9.3366      2.99  .Q        .         .         .         .
  21.00      9.3761      2.94  .Q        .         .         .         .
  21.16      9.4148      2.88  .Q        .         .         .         .
  21.32      9.4529      2.83  .Q        .         .         .         .
  21.48      9.4903      2.79  .Q        .         .         .         .
  21.64      9.5271      2.74  .Q        .         .         .         .
  21.80      9.5633      2.70  .Q        .         .         .         .
  21.96      9.5989      2.65  .Q        .         .         .         .
  22.12      9.6340      2.61  .Q        .         .         .         .
  22.29      9.6686      2.58  .Q        .         .         .         .
  22.45      9.7026      2.54  .Q        .         .         .         .
  22.61      9.7362      2.50  .Q        .         .         .         .
  22.77      9.7694      2.47  .Q        .         .         .         .
  22.93      9.8020      2.44  .Q        .         .         .         .
  23.09      9.8343      2.41  .Q        .         .         .         .
  23.25      9.8661      2.38  .Q        .         .         .         .
  23.41      9.8976      2.35  .Q        .         .         .         .
  23.57      9.9286      2.32  .Q        .         .         .         .
  23.74      9.9593      2.29  .Q        .         .         .         .
  23.90      9.9896      2.26  .Q        .         .         .         .
  24.06     10.0196      2.24  .Q        .         .         .         .
  24.22     10.0345      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                Duration
        Peak Flow Rate                     (minutes)
```

0%	1440.8
10%	203.1
20%	58.0
30%	29.0
40%	19.3
50%	9.7
60%	9.7
70%	9.7
80%	9.7
90%	9.7

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A4
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   48.40
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 13.39
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    18.23
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     5.28

******************************************************************************
  TIME     VOLUME       Q    0.       30.0      60.0      90.0     120.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.16      0.0259      4.05  .Q        .         .         .         .
  0.38      0.1007      4.06  .Q        .         .         .         .
  0.60      0.1761      4.11  .Q        .         .         .         .
  0.82      0.2520      4.13  .Q        .         .         .         .
  1.05      0.3286      4.17  .Q        .         .         .         .
  1.27      0.4057      4.20  .Q        .         .         .         .
  1.49      0.4836      4.24  .Q        .         .         .         .
  1.72      0.5620      4.27  .Q        .         .         .         .
  1.94      0.6412      4.32  .Q        .         .         .         .
  2.16      0.7211      4.34  .Q        .         .         .         .
  2.39      0.8016      4.39  .Q        .         .         .         .
  2.61      0.8829      4.42  .Q        .         .         .         .
  2.83      0.9650      4.48  .Q        .         .         .         .
  3.06      1.0478      4.50  .Q        .         .         .         .
  3.28      1.1314      4.56  .Q        .         .         .         .
  3.50      1.2157      4.59  .Q        .         .         .         .
  3.73      1.3010      4.65  .Q        .         .         .         .
  3.95      1.3871      4.68  .Q        .         .         .         .
  4.17      1.4740      4.75  .Q        .         .         .         .
  4.40      1.5619      4.78  .Q        .         .         .         .
  4.62      1.6507      4.85  .Q        .         .         .         .
```

4.84	1.7404	4.88	.Q	.	.	.	.	
5.06	1.8311	4.96	.Q	.	.	.	.	
5.29	1.9229	4.99	.Q	.	.	.	.	
5.51	2.0157	5.07	.Q	.	.	.	.	
5.73	2.1096	5.11	.Q	.	.	.	.	
5.96	2.2046	5.19	.Q	.	.	.	.	
6.18	2.3008	5.24	.Q	.	.	.	.	
6.40	2.3981	5.32	.Q	.	.	.	.	
6.63	2.4968	5.37	.Q	.	.	.	.	
6.85	2.5967	5.46	.Q	.	.	.	.	
7.07	2.6979	5.51	.Q	.	.	.	.	
7.30	2.8005	5.62	.Q	.	.	.	.	
7.52	2.9046	5.67	.Q	.	.	.	.	
7.74	3.0102	5.78	.Q	.	.	.	.	
7.97	3.1173	5.84	.Q	.	.	.	.	
8.19	3.2261	5.96	.Q	.	.	.	.	
8.41	3.3365	6.02	. Q	.	.	.	.	
8.64	3.4488	6.15	. Q	.	.	.	.	
8.86	3.5629	6.22	. Q	.	.	.	.	
9.08	3.6789	6.36	. Q	.	.	.	.	
9.30	3.7970	6.44	. Q	.	.	.	.	
9.53	3.9173	6.60	. Q	.	.	.	.	
9.75	4.0398	6.68	. Q	.	.	.	.	
9.97	4.1647	6.86	. Q	.	.	.	.	
10.20	4.2921	6.95	. Q	.	.	.	.	
10.42	4.4222	7.15	. Q	.	.	.	.	
10.64	4.5551	7.26	. Q	.	.	.	.	
10.87	4.6911	7.48	. Q	.	.	.	.	
11.09	4.8302	7.60	. Q	.	.	.	.	
11.31	4.9728	7.86	. Q	.	.	.	.	
11.54	5.1190	8.00	. Q	.	.	.	.	
11.76	5.2693	8.29	. Q	.	.	.	.	
11.98	5.4238	8.46	. Q	.	.	.	.	
12.21	5.5906	9.64	. Q	.	.	.	.	
12.43	5.7711	9.94	. Q	.	.	.	.	
12.65	5.9583	10.36	. Q	.	.	.	.	
12.88	6.1515	10.59	. Q	.	.	.	.	
13.10	6.3515	11.10	. Q	.	.	.	.	
13.32	6.5590	11.39	. Q	.	.	.	.	
13.55	6.7750	12.03	. Q	.	.	.	.	
13.77	7.0003	12.40	. Q	.	.	.	.	
13.99	7.2367	13.24	. Q	.	.	.	.	
14.21	7.4819	13.35	. Q	.	.	.	.	
14.44	7.7343	14.03	. Q	.	.	.	.	
14.66	7.9996	14.73	. Q	.	.	.	.	
14.88	8.2877	16.51	. Q	.	.	.	.	
15.11	8.6030	17.67	. Q	.	.	.	.	
15.33	8.9586	20.90	. Q	.	.	.	.	
15.55	9.3830	25.12	. Q .		.	.	.	
15.78	9.9431	35.61	. .Q		.	.	.	
16.00	10.6888	45.26	. . Q		.	.	.	
16.22	12.1265	110.63	. .		.	. Q	.	
16.45	13.4278	30.48	. Q		.	.	.	
16.67	13.8848	19.09	. Q	.	.	.	.	
16.89	14.2043	15.55	. Q	.	.	.	.	
17.12	14.4714	13.41	. Q	.	.	.	.	
17.34	14.7131	12.80	. Q	.	.	.	.	
17.56	14.9390	11.70	. Q	.	.	.	.	
17.79	15.1468	10.84	. Q	.	.	.	.	
18.01	15.3403	10.14	. Q	.	.	.	.	
18.23	15.5134	8.63	. Q	.	.	.	.	
18.45	15.6680	8.14	. Q	.	.	.	.	
18.68	15.8143	7.73	. Q	.	.	.	.	
18.90	15.9536	7.37	. Q	.	.	.	.	
19.12	16.0866	7.05	. Q	.	.	.	.	
19.35	16.2140	6.77	. Q	.	.	.	.	
19.57	16.3366	6.52	. Q	.	.	.	.	
19.79	16.4547	6.29	. Q	.	.	.	.	
20.02	16.5689	6.09	. Q	.	.	.	.	

20.24	16.6794	5.90	.Q	.	.	.	.
20.46	16.7865	5.72	.Q	.	.	.	.
20.69	16.8906	5.56	.Q	.	.	.	.
20.91	16.9919	5.42	.Q	.	.	.	.
21.13	17.0905	5.28	.Q	.	.	.	.
21.36	17.1867	5.15	.Q	.	.	.	.
21.58	17.2806	5.03	.Q	.	.	.	.
21.80	17.3724	4.92	.Q	.	.	.	.
22.03	17.4621	4.81	.Q	.	.	.	.
22.25	17.5500	4.71	.Q	.	.	.	.
22.47	17.6361	4.62	.Q	.	.	.	.
22.69	17.7205	4.53	.Q	.	.	.	.
22.92	17.8033	4.45	.Q	.	.	.	.
23.14	17.8846	4.37	.Q	.	.	.	.
23.36	17.9644	4.29	.Q	.	.	.	.
23.59	18.0429	4.22	.Q	.	.	.	.
23.81	18.1201	4.15	.Q	.	.	.	.
24.03	18.1961	4.08	.Q	.	.	.	.
24.26	18.2337	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%	1446.1
10%	281.2
20%	67.0
30%	40.2
40%	26.8
50%	13.4
60%	13.4
70%	13.4
80%	13.4
90%	13.4

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A5
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   85.66
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 29.27
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    32.44
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     9.18

******************************************************************************
  TIME     VOLUME       Q    0.       35.0      70.0     105.0     140.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.39      0.1443      7.16  . Q       .         .         .         .
  0.88      0.4357      7.29  . Q       .         .         .         .
  1.36      0.7315      7.38  . Q       .         .         .         .
  1.85      1.0327      7.56  . Q       .         .         .         .
  2.34      1.3395      7.66  . Q       .         .         .         .
  2.83      1.6524      7.86  . Q       .         .         .         .
  3.32      1.9715      7.97  . Q       .         .         .         .
  3.80      2.2974      8.20  . Q       .         .         .         .
  4.29      2.6303      8.32  . Q       .         .         .         .
  4.78      2.9708      8.57  . Q       .         .         .         .
  5.27      3.3193      8.71  . Q       .         .         .         .
  5.76      3.6765      9.01  . Q       .         .         .         .
  6.24      4.0427      9.16  . Q       .         .         .         .
  6.73      4.4191      9.50  . Q       .         .         .         .
  7.22      4.8060      9.69  . Q       .         .         .         .
  7.71      5.2046     10.09  . Q       .         .         .         .
  8.19      5.6158     10.31  . Q       .         .         .         .
  8.68      6.0410     10.79  .  Q      .         .         .         .
  9.17      6.4811     11.05  .  Q      .         .         .         .
  9.66      6.9384     11.64  .  Q      .         .         .         .
 10.15      7.4142     11.96  .  Q      .         .         .         .
```

```
 10.63     7.9115    12.71  .  Q      .         .         .         .
 11.12     8.4323    13.13  .  Q      .         .         .         .
 11.61     8.9814    14.11  .   Q     .         .         .         .
 12.10     9.5617    14.68  .   Q     .         .         .         .
 12.59    10.2148    17.72  .    Q    .         .         .         .
 13.07    10.9462    18.56  .    Q    .         .         .         .
 13.56    11.7368    20.67  .    Q    .         .         .         .
 14.05    12.5974    22.03  .     Q   .         .         .         .
 14.54    13.5305    24.26  .     Q   .         .         .         .
 15.02    14.5648    27.05  .      Q  .         .         .         .
 15.51    15.8682    37.61  .         Q         .         .         .
 16.00    17.7590    56.18  .         .     Q   .         .         .
 16.49    21.5391   131.34  .         .         .         .      Q  .
 16.98    24.8119    31.01  .       Q .         .         .         .
 17.46    25.9099    23.46  .     Q   .         .         .         .
 17.95    26.7765    19.53  .    Q    .         .         .         .
 18.44    27.4890    15.82  .   Q     .         .         .         .
 18.93    28.0820    13.59  .  Q      .         .         .         .
 19.41    28.6044    12.32  .  Q      .         .         .         .
 19.90    29.0812    11.33  .  Q      .         .         .         .
 20.39    29.5221    10.54  .  Q      .         .         .         .
 20.88    29.9337     9.88  . Q       .         .         .         .
 21.37    30.3210     9.33  . Q       .         .         .         .
 21.85    30.6876     8.86  . Q       .         .         .         .
 22.34    31.0363     8.44  . Q       .         .         .         .
 22.83    31.3694     8.08  . Q       .         .         .         .
 23.32    31.6887     7.76  . Q       .         .         .         .
 23.81    31.9957     7.47  . Q       .         .         .         .
 24.29    32.2916     7.21  . Q       .         .         .         .
 24.78    32.4369     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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
              0%                            1463.5
             10%                             468.3
             20%                             146.4
             30%                              58.5
             40%                              58.5
             50%                              29.3
             60%                              29.3
             70%                              29.3
             80%                              29.3
             90%                              29.3
```

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

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A6
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   89.75
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 19.62
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    33.89
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     9.71

******************************************************************************
  TIME     VOLUME       Q    0.       42.5      85.0     127.5     170.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.30      0.1014      7.50  .Q        .         .         .         .
  0.63      0.3055      7.60  .Q        .         .         .         .
  0.96      0.5118      7.66  .Q        .         .         .         .
  1.28      0.7206      7.79  .Q        .         .         .         .
  1.61      0.9319      7.85  .Q        .         .         .         .
  1.94      1.1458      7.98  .Q        .         .         .         .
  2.27      1.3625      8.05  .Q        .         .         .         .
  2.59      1.5820      8.19  .Q        .         .         .         .
  2.92      1.8045      8.27  .Q        .         .         .         .
  3.25      2.0300      8.42  .Q        .         .         .         .
  3.57      2.2586      8.50  . Q       .         .         .         .
  3.90      2.4906      8.67  . Q       .         .         .         .
  4.23      2.7260      8.75  . Q       .         .         .         .
  4.55      2.9649      8.93  . Q       .         .         .         .
  4.88      3.2076      9.03  . Q       .         .         .         .
  5.21      3.4543      9.22  . Q       .         .         .         .
  5.54      3.7050      9.33  . Q       .         .         .         .
  5.86      3.9600      9.54  . Q       .         .         .         .
  6.19      4.2195      9.66  . Q       .         .         .         .
  6.52      4.4837      9.90  . Q       .         .         .         .
  6.84      4.7528     10.02  . Q       .         .         .         .
```

```
  7.17      5.0273     10.29  . Q       .         .         .         .
  7.50      5.3072     10.43  . Q       .         .         .         .
  7.82      5.5931     10.73  . Q       .         .         .         .
  8.15      5.8851     10.88  . Q       .         .         .         .
  8.48      6.1838     11.22  . Q       .         .         .         .
  8.81      6.4895     11.40  . Q       .         .         .         .
  9.13      6.8029     11.79  . Q       .         .         .         .
  9.46      7.1242     11.99  . Q       .         .         .         .
  9.79      7.4543     12.44  . Q       .         .         .         .
 10.11      7.7937     12.68  . Q       .         .         .         .
 10.44      8.1434     13.20  .  Q      .         .         .         .
 10.77      8.5041     13.49  .  Q      .         .         .         .
 11.10      8.8771     14.11  .  Q      .         .         .         .
 11.42      9.2632     14.46  .  Q      .         .         .         .
 11.75      9.6643     15.23  .  Q      .         .         .         .
 12.08     10.0817     15.66  .  Q      .         .         .         .
 12.40     10.5416     18.38  .   Q     .         .         .         .
 12.73     11.0457     18.93  .   Q     .         .         .         .
 13.06     11.5748     20.22  .   Q     .         .         .         .
 13.38     12.1314     20.97  .   Q     .         .         .         .
 13.71     12.7221     22.75  .    Q    .         .         .         .
 14.04     13.3515     23.83  .    Q    .         .         .         .
 14.37     14.0102     24.92  .    Q    .         .         .         .
 14.69     14.7073     26.67  .     Q   .         .         .         .
 15.02     15.4938     31.54  .      Q  .         .         .         .
 15.35     16.3950     35.16  .       Q .         .         .         .
 15.67     17.6195     55.46  .         .  Q      .         .         .
 16.00     19.3214     70.50  .         .     Q   .         .         .
 16.33     22.5585    169.06  .         .         .         .        Q.
 16.65     25.3931     40.72  .        Q.         .         .         .
 16.98     26.3326     28.81  .     Q   .         .         .         .
 17.31     27.0569     24.79  .    Q    .         .         .         .
 17.64     27.6865     21.81  .    Q    .         .         .         .
 17.96     28.2453     19.55  .   Q     .         .         .         .
 18.29     28.7355     16.73  .  Q      .         .         .         .
 18.62     29.1620     14.83  .  Q      .         .         .         .
 18.94     29.5487     13.79  .  Q      .         .         .         .
 19.27     29.9098     12.93  .  Q      .         .         .         .
 19.60     30.2496     12.21  . Q       .         .         .         .
 19.92     30.5712     11.59  . Q       .         .         .         .
 20.25     30.8771     11.05  . Q       .         .         .         .
 20.58     31.1693     10.57  . Q       .         .         .         .
 20.91     31.4494     10.15  . Q       .         .         .         .
 21.23     31.7187      9.78  . Q       .         .         .         .
 21.56     31.9782      9.43  . Q       .         .         .         .
 21.89     32.2290      9.12  . Q       .         .         .         .
 22.21     32.4718      8.84  . Q       .         .         .         .
 22.54     32.7072      8.58  . Q       .         .         .         .
 22.87     32.9360      8.34  .Q        .         .         .         .
 23.19     33.1584      8.12  .Q        .         .         .         .
 23.52     33.3751      7.92  .Q        .         .         .         .
 23.85     33.5865      7.72  .Q        .         .         .         .
 24.17     33.7928      7.54  .Q        .         .         .         .
 24.50     33.8947      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               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
               0%                         1451.9
              10%                          353.2
              20%                           98.1
              30%                           58.9
              40%                           39.2
              50%                           19.6
```

60%	19.6
70%	19.6
80%	19.6
90%	19.6

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  PRE-DEVELOPMENT, 100-YEAR STORM EVENT, DA A7
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   42.02
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 12.28
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    15.85
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     4.56

******************************************************************************
  TIME     VOLUME       Q    0.       27.5      55.0      82.5     110.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.04      0.0000      0.00  Q         .         .         .         .
  0.24      0.0298      3.52  .Q        .         .         .         .
  0.45      0.0895      3.54  .Q        .         .         .         .
  0.65      0.1496      3.57  .Q        .         .         .         .
  0.85      0.2102      3.59  .Q        .         .         .         .
  1.06      0.2712      3.63  .Q        .         .         .         .
  1.26      0.3327      3.64  .Q        .         .         .         .
  1.47      0.3947      3.68  .Q        .         .         .         .
  1.67      0.4571      3.70  .Q        .         .         .         .
  1.88      0.5201      3.74  .Q        .         .         .         .
  2.08      0.5835      3.76  .Q        .         .         .         .
  2.29      0.6475      3.80  .Q        .         .         .         .
  2.49      0.7119      3.82  .Q        .         .         .         .
  2.70      0.7770      3.87  .Q        .         .         .         .
  2.90      0.8425      3.89  .Q        .         .         .         .
  3.11      0.9087      3.93  .Q        .         .         .         .
  3.31      0.9754      3.96  .Q        .         .         .         .
  3.52      1.0427      4.00  .Q        .         .         .         .
  3.72      1.1106      4.03  .Q        .         .         .         .
  3.92      1.1791      4.08  .Q        .         .         .         .
  4.13      1.2483      4.10  .Q        .         .         .         .
```

4.33	1.3182	4.16	.Q . . . .
4.54	1.3887	4.18	.Q . . . .
4.74	1.4599	4.24	.Q . . . .
4.95	1.5318	4.27	.Q . . . .
5.15	1.6044	4.32	.Q . . . .
5.36	1.6778	4.35	.Q . . . .
5.56	1.7520	4.42	.Q . . . .
5.77	1.8270	4.45	.Q . . . .
5.97	1.9028	4.51	.Q . . . .
6.18	1.9795	4.55	.Q . . . .
6.38	2.0570	4.62	.Q . . . .
6.59	2.1354	4.66	.Q . . . .
6.79	2.2148	4.73	.Q . . . .
6.99	2.2952	4.77	.Q . . . .
7.20	2.3765	4.85	.Q . . . .
7.40	2.4589	4.89	.Q . . . .
7.61	2.5424	4.98	.Q . . . .
7.81	2.6269	5.02	.Q . . . .
8.02	2.7127	5.12	.Q . . . .
8.22	2.7996	5.16	.Q . . . .
8.43	2.8878	5.27	.Q . . . .
8.63	2.9773	5.32	.Q . . . .
8.84	3.0682	5.43	.Q . . . .
9.04	3.1605	5.48	.Q . . . .
9.25	3.2543	5.60	. Q . . . .
9.45	3.3496	5.67	. Q . . . .
9.66	3.4465	5.80	. Q . . . .
9.86	3.5452	5.87	. Q . . . .
10.06	3.6457	6.01	. Q . . . .
10.27	3.7480	6.09	. Q . . . .
10.47	3.8524	6.25	. Q . . . .
10.68	3.9588	6.34	. Q . . . .
10.88	4.0675	6.52	. Q . . . .
11.09	4.1786	6.61	. Q . . . .
11.29	4.2921	6.82	. Q . . . .
11.50	4.4084	6.93	. Q . . . .
11.70	4.5275	7.16	. Q . . . .
11.91	4.6497	7.29	. Q . . . .
12.11	4.7774	7.81	. Q . . . .
12.32	4.9155	8.52	. Q . . . .
12.52	5.0624	8.84	. Q . . . .
12.73	5.2134	9.02	. Q . . . .
12.93	5.3691	9.40	. Q . . . .
13.13	5.5298	9.61	. Q . . . .
13.34	5.6963	10.07	. Q . . . .
13.54	5.8689	10.33	. Q . . . .
13.75	6.0486	10.92	. Q . . . .
13.95	6.2360	11.25	. Q . . . .
14.16	6.4286	11.52	. Q . . . .
14.36	6.6249	11.70	. Q . . . .
14.57	6.8318	12.76	. Q . . . .
14.77	7.0531	13.40	. Q . . . .
14.98	7.2935	15.02	. Q . . . .
15.18	7.5565	16.07	. Q . . . .
15.39	7.8532	19.01	. Q . . . .
15.59	8.2179	24.11	. Q . . . .
15.80	8.6934	32.11	. .Q . . . .
16.00	9.3111	40.92	. . Q . . . .
16.20	10.5056	100.32	. . . . Q .
16.41	11.5870	27.54	. Q . . . .
16.61	11.9668	17.37	. Q . . . .
16.82	12.2333	14.15	. Q . . . .
17.02	12.4561	12.20	. Q . . . .
17.23	12.6575	11.61	. Q . . . .
17.43	12.8454	10.61	. Q . . . .
17.64	13.0183	9.83	. Q . . . .
17.84	13.1793	9.20	. Q . . . .
18.05	13.3305	8.68	. Q . . . .
18.25	13.4666	7.42	. Q . . . .

```
  18.46     13.5889      7.04  . Q       .         .         .         .
  18.66     13.7052      6.71  . Q       .         .         .         .
  18.87     13.8163      6.42  . Q       .         .         .         .
  19.07     13.9228      6.17  . Q       .         .         .         .
  19.27     14.0252      5.94  . Q       .         .         .         .
  19.48     14.1239      5.73  . Q       .         .         .         .
  19.68     14.2192      5.54  . Q       .         .         .         .
  19.89     14.3115      5.37  .Q        .         .         .         .
  20.09     14.4011      5.21  .Q        .         .         .         .
  20.30     14.4880      5.07  .Q        .         .         .         .
  20.50     14.5726      4.93  .Q        .         .         .         .
  20.71     14.6550      4.81  .Q        .         .         .         .
  20.91     14.7354      4.69  .Q        .         .         .         .
  21.12     14.8138      4.58  .Q        .         .         .         .
  21.32     14.8905      4.48  .Q        .         .         .         .
  21.53     14.9655      4.39  .Q        .         .         .         .
  21.73     15.0389      4.29  .Q        .         .         .         .
  21.94     15.1108      4.21  .Q        .         .         .         .
  22.14     15.1814      4.13  .Q        .         .         .         .
  22.34     15.2505      4.05  .Q        .         .         .         .
  22.55     15.3185      3.98  .Q        .         .         .         .
  22.75     15.3852      3.91  .Q        .         .         .         .
  22.96     15.4508      3.84  .Q        .         .         .         .
  23.16     15.5152      3.78  .Q        .         .         .         .
  23.37     15.5787      3.72  .Q        .         .         .         .
  23.57     15.6411      3.66  .Q        .         .         .         .
  23.78     15.7026      3.61  .Q        .         .         .         .
  23.98     15.7632      3.56  .Q        .         .         .         .
  24.19     15.8230      3.51  .Q        .         .         .         .
  24.39     15.8527      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               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
              0%                          1449.0
             10%                           257.9
             20%                            61.4
             30%                            36.8
             40%                            24.6
             50%                            12.3
             60%                            12.3
             70%                            12.3
             80%                            12.3
             90%                            12.3
```

Appendix I.III

Synthetic Unit Hydrograph Method Analysis
Post-Development Conditions
2-Year Storm

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

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                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------
 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A1
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   55.00
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.201
    LOW LOSS FRACTION = 0.287
    TIME OF CONCENTRATION(MIN.) = 11.08
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.21
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     3.97

******************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.12      0.0000      0.00  Q         .         .         .         .
  0.30      0.0121      1.58  .Q        .         .         .         .
  0.49      0.0362      1.59  .Q        .         .         .         .
  0.67      0.0606      1.60  .Q        .         .         .         .
  0.86      0.0851      1.61  .Q        .         .         .         .
  1.04      0.1097      1.62  .Q        .         .         .         .
  1.23      0.1346      1.63  .Q        .         .         .         .
  1.41      0.1596      1.65  .Q        .         .         .         .
  1.60      0.1848      1.65  .Q        .         .         .         .
  1.78      0.2102      1.67  .Q        .         .         .         .
  1.97      0.2357      1.68  .Q        .         .         .         .
  2.15      0.2614      1.69  .Q        .         .         .         .
  2.33      0.2874      1.70  .Q        .         .         .         .
  2.52      0.3135      1.72  .Q        .         .         .         .
  2.70      0.3398      1.73  .Q        .         .         .         .
  2.89      0.3664      1.75  .Q        .         .         .         .
  3.07      0.3931      1.76  .Q        .         .         .         .
  3.26      0.4201      1.78  .Q        .         .         .         .
  3.44      0.4472      1.79  .Q        .         .         .         .
  3.63      0.4746      1.80  .Q        .         .         .         .
  3.81      0.5023      1.81  .Q        .         .         .         .
  4.00      0.5301      1.84  .Q        .         .         .         .
```

4.18	0.5582	1.85	.Q . . . .
4.37	0.5865	1.87	.Q . . . .
4.55	0.6151	1.88	.Q . . . .
4.74	0.6440	1.90	.Q . . . .
4.92	0.6731	1.91	.Q . . . .
5.10	0.7025	1.94	.Q . . . .
5.29	0.7321	1.95	.Q . . . .
5.47	0.7621	1.97	.Q . . . .
5.66	0.7923	1.99	.Q . . . .
5.84	0.8228	2.01	.Q . . . .
6.03	0.8537	2.03	.Q . . . .
6.21	0.8849	2.06	.Q . . . .
6.40	0.9163	2.07	.Q . . . .
6.58	0.9482	2.10	.Q . . . .
6.77	0.9804	2.12	.Q . . . .
6.95	1.0129	2.15	.Q . . . .
7.14	1.0458	2.16	.Q . . . .
7.32	1.0791	2.20	.Q . . . .
7.51	1.1127	2.22	.Q . . . .
7.69	1.1468	2.25	.Q . . . .
7.87	1.1813	2.27	.Q . . . .
8.06	1.2163	2.31	.Q . . . .
8.24	1.2517	2.33	.Q . . . .
8.43	1.2875	2.37	.Q . . . .
8.61	1.3239	2.39	.Q . . . .
8.80	1.3607	2.44	.Q . . . .
8.98	1.3981	2.46	.Q . . . .
9.17	1.4360	2.51	. Q . . . .
9.35	1.4745	2.53	. Q . . . .
9.54	1.5136	2.59	. Q . . . .
9.72	1.5533	2.61	. Q . . . .
9.91	1.5936	2.67	. Q . . . .
10.09	1.6346	2.70	. Q . . . .
10.28	1.6764	2.77	. Q . . . .
10.46	1.7188	2.80	. Q . . . .
10.64	1.7621	2.87	. Q . . . .
10.83	1.8062	2.91	. Q . . . .
11.01	1.8511	2.98	. Q . . . .
11.20	1.8970	3.03	. Q . . . .
11.38	1.9438	3.11	. Q . . . .
11.57	1.9917	3.16	. Q . . . .
11.75	2.0407	3.26	. Q . . . .
11.94	2.0908	3.31	. Q . . . .
12.12	2.1448	3.76	. Q . . . .
12.31	2.2053	4.17	. Q . . . .
12.49	2.2700	4.30	. Q . . . .
12.68	2.3362	4.37	. Q . . . .
12.86	2.4041	4.53	. Q . . . .
13.05	2.4739	4.61	. Q . . . .
13.23	2.5457	4.79	. Q . . . .
13.41	2.6196	4.89	. Q . . . .
13.60	2.6960	5.12	. Q . . . .
13.78	2.7750	5.24	. Q . . . .
13.97	2.8570	5.51	. Q . . . .
14.15	2.9423	5.66	. Q . . . .
14.34	3.0312	5.99	. Q . . . .
14.52	3.1242	6.20	. Q . . . .
14.71	3.2225	6.69	. Q . . . .
14.89	3.3268	6.99	. Q . . . .
15.08	3.4392	7.73	. Q . . . .
15.26	3.5608	8.21	. Q . . . .
15.45	3.6971	9.65	. Q . . . .
15.63	3.8530	10.78	. Q . . . .
15.82	4.0425	14.06	. .Q . . . .
16.00	4.2868	17.96	. . Q . . . .
16.18	4.7812	46.84	. . . . Q .
16.37	5.2310	12.12	. Q. . . . .
16.55	5.3906	8.79	. Q . . . .
16.74	5.5137	7.33	. Q . . . .

```
 16.92      5.6187      6.43  .    Q    .         .         .         .
 17.11      5.7120      5.80  .   Q     .         .         .         .
 17.29      5.7972      5.37  .   Q     .         .         .         .
 17.48      5.8763      5.00  .   Q     .         .         .         .
 17.66      5.9504      4.70  .  Q      .         .         .         .
 17.85      6.0202      4.45  .  Q      .         .         .         .
 18.03      6.0865      4.24  .  Q      .         .         .         .
 18.22      6.1445      3.37  . Q       .         .         .         .
 18.40      6.1946      3.21  . Q       .         .         .         .
 18.59      6.2425      3.07  . Q       .         .         .         .
 18.77      6.2884      2.94  . Q       .         .         .         .
 18.95      6.3325      2.83  . Q       .         .         .         .
 19.14      6.3750      2.73  . Q       .         .         .         .
 19.32      6.4160      2.64  . Q       .         .         .         .
 19.51      6.4557      2.56  . Q       .         .         .         .
 19.69      6.4942      2.48  .Q        .         .         .         .
 19.88      6.5316      2.41  .Q        .         .         .         .
 20.06      6.5680      2.35  .Q        .         .         .         .
 20.25      6.6034      2.29  .Q        .         .         .         .
 20.43      6.6379      2.23  .Q        .         .         .         .
 20.62      6.6716      2.18  .Q        .         .         .         .
 20.80      6.7045      2.13  .Q        .         .         .         .
 20.99      6.7366      2.09  .Q        .         .         .         .
 21.17      6.7681      2.04  .Q        .         .         .         .
 21.36      6.7990      2.00  .Q        .         .         .         .
 21.54      6.8292      1.96  .Q        .         .         .         .
 21.72      6.8589      1.93  .Q        .         .         .         .
 21.91      6.8880      1.89  .Q        .         .         .         .
 22.09      6.9166      1.86  .Q        .         .         .         .
 22.28      6.9447      1.83  .Q        .         .         .         .
 22.46      6.9723      1.79  .Q        .         .         .         .
 22.65      6.9995      1.77  .Q        .         .         .         .
 22.83      7.0262      1.74  .Q        .         .         .         .
 23.02      7.0526      1.71  .Q        .         .         .         .
 23.20      7.0785      1.69  .Q        .         .         .         .
 23.39      7.1041      1.66  .Q        .         .         .         .
 23.57      7.1292      1.64  .Q        .         .         .         .
 23.76      7.1541      1.62  .Q        .         .         .         .
 23.94      7.1786      1.59  .Q        .         .         .         .
 24.13      7.2028      1.57  .Q        .         .         .         .
 24.31      7.2148      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
              0%                            1440.4
             10%                             277.0
             20%                              66.5
             30%                              33.2
             40%                              11.1
             50%                              11.1
             60%                              11.1
             70%                              11.1
             80%                              11.1
             90%                              11.1
```

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A2
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   18.95
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.319
    LOW LOSS FRACTION = 0.401
    TIME OF CONCENTRATION(MIN.) = 11.77
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     2.10
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.75

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.11      0.0021      0.45  Q         .         .         .         .
  0.31      0.0095      0.46  Q         .         .         .         .
  0.50      0.0169      0.46  Q         .         .         .         .
  0.70      0.0244      0.46  Q         .         .         .         .
  0.90      0.0319      0.47  Q         .         .         .         .
  1.09      0.0395      0.47  Q         .         .         .         .
  1.29      0.0472      0.47  Q         .         .         .         .
  1.48      0.0549      0.48  Q         .         .         .         .
  1.68      0.0626      0.48  Q         .         .         .         .
  1.88      0.0705      0.48  Q         .         .         .         .
  2.07      0.0784      0.49  Q         .         .         .         .
  2.27      0.0863      0.49  Q         .         .         .         .
  2.46      0.0943      0.50  Q         .         .         .         .
  2.66      0.1024      0.50  Q         .         .         .         .
  2.86      0.1105      0.50  .Q        .         .         .         .
  3.05      0.1187      0.51  .Q        .         .         .         .
  3.25      0.1270      0.51  .Q        .         .         .         .
  3.45      0.1354      0.52  .Q        .         .         .         .
  3.64      0.1438      0.52  .Q        .         .         .         .
  3.84      0.1523      0.53  .Q        .         .         .         .
  4.03      0.1609      0.53  .Q        .         .         .         .
```

```
 4.23     0.1695     0.54  .Q       .        .        .        .
 4.43     0.1783     0.54  .Q       .        .        .        .
 4.62     0.1871     0.55  .Q       .        .        .        .
 4.82     0.1960     0.55  .Q       .        .        .        .
 5.01     0.2050     0.56  .Q       .        .        .        .
 5.21     0.2140     0.56  .Q       .        .        .        .
 5.41     0.2232     0.57  .Q       .        .        .        .
 5.60     0.2325     0.58  .Q       .        .        .        .
 5.80     0.2418     0.58  .Q       .        .        .        .
 6.00     0.2513     0.59  .Q       .        .        .        .
 6.19     0.2608     0.59  .Q       .        .        .        .
 6.39     0.2705     0.60  .Q       .        .        .        .
 6.58     0.2803     0.61  .Q       .        .        .        .
 6.78     0.2902     0.61  .Q       .        .        .        .
 6.98     0.3002     0.62  .Q       .        .        .        .
 7.17     0.3103     0.63  .Q       .        .        .        .
 7.37     0.3206     0.64  .Q       .        .        .        .
 7.56     0.3310     0.65  .Q       .        .        .        .
 7.76     0.3415     0.65  .Q       .        .        .        .
 7.96     0.3521     0.66  .Q       .        .        .        .
 8.15     0.3629     0.67  .Q       .        .        .        .
 8.35     0.3739     0.68  .Q       .        .        .        .
 8.55     0.3850     0.69  .Q       .        .        .        .
 8.74     0.3963     0.70  .Q       .        .        .        .
 8.94     0.4077     0.71  .Q       .        .        .        .
 9.13     0.4193     0.72  .Q       .        .        .        .
 9.33     0.4311     0.73  .Q       .        .        .        .
 9.53     0.4431     0.75  .Q       .        .        .        .
 9.72     0.4553     0.76  .Q       .        .        .        .
 9.92     0.4677     0.77  .Q       .        .        .        .
10.11     0.4803     0.78  .Q       .        .        .        .
10.31     0.4932     0.80  .Q       .        .        .        .
10.51     0.5063     0.81  .Q       .        .        .        .
10.70     0.5196     0.83  .Q       .        .        .        .
10.90     0.5333     0.85  .Q       .        .        .        .
11.10     0.5472     0.87  .Q       .        .        .        .
11.29     0.5614     0.88  .Q       .        .        .        .
11.49     0.5760     0.91  .Q       .        .        .        .
11.68     0.5909     0.93  .Q       .        .        .        .
11.88     0.6062     0.96  .Q       .        .        .        .
12.08     0.6218     0.98  .Q       .        .        .        .
12.27     0.6395     1.21  . Q      .        .        .        .
12.47     0.6593     1.23  . Q      .        .        .        .
12.67     0.6796     1.27  . Q      .        .        .        .
12.86     0.7005     1.30  . Q      .        .        .        .
13.06     0.7219     1.35  . Q      .        .        .        .
13.25     0.7440     1.38  . Q      .        .        .        .
13.45     0.7668     1.44  . Q      .        .        .        .
13.65     0.7904     1.47  . Q      .        .        .        .
13.84     0.8150     1.55  .  Q     .        .        .        .
14.04     0.8405     1.60  .  Q     .        .        .        .
14.23     0.8670     1.68  .  Q     .        .        .        .
14.43     0.8948     1.74  .  Q     .        .        .        .
14.63     0.9242     1.88  .  Q     .        .        .        .
14.82     0.9553     1.97  .  Q     .        .        .        .
15.02     0.9889     2.17  .   Q    .        .        .        .
15.22     1.0252     2.31  .   Q    .        .        .        .
15.41     1.0657     2.69  .    Q   .        .        .        .
15.61     1.1121     3.03  .     Q  .        .        .        .
15.80     1.1688     3.96  .      Q .        .        .        .
16.00     1.2419     5.05  .         Q       .        .        .
16.20     1.3929    13.58  .         .       .     Q  .        .
16.39     1.5306     3.41  .     Q   .        .        .        .
16.59     1.5783     2.47  .   Q     .        .        .        .
16.78     1.6151     2.06  .   Q     .        .        .        .
16.98     1.6464     1.81  .  Q      .        .        .        .
17.18     1.6744     1.64  .  Q      .        .        .        .
17.37     1.6999     1.51  .  Q      .        .        .        .
17.57     1.7236     1.41  . Q       .        .        .        .
```

```
  17.77      1.7457      1.32  . Q       .         .         .         .
  17.96      1.7666      1.25  . Q       .         .         .         .
  18.16      1.7857      1.11  . Q       .         .         .         .
  18.35      1.8023      0.94  .Q        .         .         .         .
  18.55      1.8172      0.90  .Q        .         .         .         .
  18.75      1.8315      0.86  .Q        .         .         .         .
  18.94      1.8451      0.82  .Q        .         .         .         .
  19.14      1.8582      0.79  .Q        .         .         .         .
  19.33      1.8708      0.76  .Q        .         .         .         .
  19.53      1.8830      0.74  .Q        .         .         .         .
  19.73      1.8948      0.72  .Q        .         .         .         .
  19.92      1.9063      0.70  .Q        .         .         .         .
  20.12      1.9174      0.68  .Q        .         .         .         .
  20.32      1.9282      0.66  .Q        .         .         .         .
  20.51      1.9387      0.64  .Q        .         .         .         .
  20.71      1.9490      0.62  .Q        .         .         .         .
  20.90      1.9590      0.61  .Q        .         .         .         .
  21.10      1.9688      0.60  .Q        .         .         .         .
  21.30      1.9783      0.58  .Q        .         .         .         .
  21.49      1.9877      0.57  .Q        .         .         .         .
  21.69      1.9969      0.56  .Q        .         .         .         .
  21.89      2.0058      0.55  .Q        .         .         .         .
  22.08      2.0147      0.54  .Q        .         .         .         .
  22.28      2.0233      0.53  .Q        .         .         .         .
  22.47      2.0318      0.52  .Q        .         .         .         .
  22.67      2.0402      0.51  .Q        .         .         .         .
  22.87      2.0484      0.50  .Q        .         .         .         .
  23.06      2.0564      0.49  Q         .         .         .         .
  23.26      2.0644      0.49  Q         .         .         .         .
  23.45      2.0722      0.48  Q         .         .         .         .
  23.65      2.0799      0.47  Q         .         .         .         .
  23.85      2.0875      0.47  Q         .         .         .         .
  24.04      2.0950      0.46  Q         .         .         .         .
  24.24      2.0987      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1447.7
              10%                            270.7
              20%                             58.9
              30%                             23.5
              40%                             11.8
              50%                             11.8
              60%                             11.8
              70%                             11.8
              80%                             11.8
              90%                             11.8
```

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A3
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   57.97
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.190
    LOW LOSS FRACTION = 0.277
    TIME OF CONCENTRATION(MIN.) = 10.56
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.72
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     4.06

******************************************************************************
  TIME     VOLUME       Q    0.       15.0      30.0      45.0      60.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.16      0.0122      1.68  .Q        .         .         .         .
  0.34      0.0367      1.69  .Q        .         .         .         .
  0.51      0.0614      1.70  .Q        .         .         .         .
  0.69      0.0862      1.71  .Q        .         .         .         .
  0.86      0.1112      1.72  .Q        .         .         .         .
  1.04      0.1363      1.74  .Q        .         .         .         .
  1.22      0.1616      1.74  .Q        .         .         .         .
  1.39      0.1871      1.76  .Q        .         .         .         .
  1.57      0.2127      1.77  .Q        .         .         .         .
  1.74      0.2386      1.78  .Q        .         .         .         .
  1.92      0.2646      1.79  .Q        .         .         .         .
  2.10      0.2907      1.81  .Q        .         .         .         .
  2.27      0.3171      1.82  .Q        .         .         .         .
  2.45      0.3436      1.83  .Q        .         .         .         .
  2.62      0.3704      1.84  .Q        .         .         .         .
  2.80      0.3973      1.86  .Q        .         .         .         .
  2.98      0.4245      1.87  .Q        .         .         .         .
  3.15      0.4518      1.89  .Q        .         .         .         .
  3.33      0.4794      1.90  .Q        .         .         .         .
  3.50      0.5071      1.92  .Q        .         .         .         .
  3.68      0.5351      1.93  .Q        .         .         .         .
```

```
 3.86     0.5633     1.95  .Q       .        .        .        .
 4.03     0.5918     1.96  .Q       .        .        .        .
 4.21     0.6204     1.98  .Q       .        .        .        .
 4.38     0.6493     1.99  .Q       .        .        .        .
 4.56     0.6785     2.02  .Q       .        .        .        .
 4.74     0.7079     2.03  .Q       .        .        .        .
 4.91     0.7375     2.05  .Q       .        .        .        .
 5.09     0.7675     2.06  .Q       .        .        .        .
 5.26     0.7977     2.09  .Q       .        .        .        .
 5.44     0.8281     2.10  .Q       .        .        .        .
 5.62     0.8589     2.13  .Q       .        .        .        .
 5.79     0.8899     2.14  .Q       .        .        .        .
 5.97     0.9212     2.17  .Q       .        .        .        .
 6.14     0.9529     2.18  .Q       .        .        .        .
 6.32     0.9848     2.21  .Q       .        .        .        .
 6.50     1.0171     2.23  .Q       .        .        .        .
 6.67     1.0497     2.26  .Q       .        .        .        .
 6.85     1.0827     2.27  .Q       .        .        .        .
 7.02     1.1160     2.31  .Q       .        .        .        .
 7.20     1.1497     2.32  .Q       .        .        .        .
 7.38     1.1837     2.36  .Q       .        .        .        .
 7.55     1.2182     2.38  .Q       .        .        .        .
 7.73     1.2530     2.41  .Q       .        .        .        .
 7.90     1.2882     2.43  .Q       .        .        .        .
 8.08     1.3239     2.47  .Q       .        .        .        .
 8.26     1.3600     2.49  .Q       .        .        .        .
 8.43     1.3966     2.54  .Q       .        .        .        .
 8.61     1.4336     2.56  .Q       .        .        .        .
 8.78     1.4712     2.60  .Q       .        .        .        .
 8.96     1.5092     2.63  .Q       .        .        .        .
 9.14     1.5478     2.68  .Q       .        .        .        .
 9.31     1.5869     2.70  .Q       .        .        .        .
 9.49     1.6265     2.76  .Q       .        .        .        .
 9.66     1.6668     2.78  .Q       .        .        .        .
 9.84     1.7077     2.84  .Q       .        .        .        .
10.02     1.7493     2.87  .Q       .        .        .        .
10.19     1.7915     2.93  .Q       .        .        .        .
10.37     1.8344     2.97  .Q       .        .        .        .
10.54     1.8781     3.04  . Q      .        .        .        .
10.72     1.9225     3.07  . Q      .        .        .        .
10.90     1.9678     3.15  . Q      .        .        .        .
11.07     2.0139     3.19  . Q      .        .        .        .
11.25     2.0610     3.28  . Q      .        .        .        .
11.42     2.1090     3.32  . Q      .        .        .        .
11.60     2.1580     3.42  . Q      .        .        .        .
11.78     2.2081     3.47  . Q      .        .        .        .
11.95     2.2593     3.58  . Q      .        .        .        .
12.13     2.3123     3.70  . Q      .        .        .        .
12.30     2.3719     4.49  . Q      .        .        .        .
12.48     2.4378     4.56  .  Q     .        .        .        .
12.66     2.5052     4.71  .  Q     .        .        .        .
12.83     2.5742     4.78  .  Q     .        .        .        .
13.01     2.6450     4.95  .  Q     .        .        .        .
13.18     2.7177     5.04  .  Q     .        .        .        .
13.36     2.7925     5.24  .  Q     .        .        .        .
13.54     2.8695     5.35  .  Q     .        .        .        .
13.71     2.9491     5.59  .  Q     .        .        .        .
13.89     3.0314     5.73  .  Q     .        .        .        .
14.06     3.1169     6.03  .   Q    .        .        .        .
14.24     3.2055     6.15  .   Q    .        .        .        .
14.42     3.2979     6.55  .   Q    .        .        .        .
14.59     3.3948     6.78  .   Q    .        .        .        .
14.77     3.4973     7.32  .   Q    .        .        .        .
14.94     3.6061     7.64  .    Q   .        .        .        .
15.12     3.7232     8.46  .    Q   .        .        .        .
15.30     3.8500     8.98  .    Q   .        .        .        .
15.47     3.9926    10.63  .      Q .        .        .        .
15.65     4.1556    11.78  .      Q .        .        .        .
15.82     4.3528    15.34  .        Q        .        .        .
```

```
 16.00     4.6071    19.63  .         .  Q      .         .         .
 16.18     5.1230    51.31  .         .         .         .   Q     .
 16.35     5.5924    13.24  .       Q .         .         .         .
 16.53     5.7587     9.62  .     Q   .         .         .         .
 16.70     5.8870     8.02  .    Q    .         .         .         .
 16.88     5.9964     7.03  .   Q     .         .         .         .
 17.06     6.0936     6.34  .   Q     .         .         .         .
 17.23     6.1825     5.87  .  Q      .         .         .         .
 17.41     6.2650     5.47  .  Q      .         .         .         .
 17.58     6.3421     5.14  .  Q      .         .         .         .
 17.76     6.4149     4.87  .  Q      .         .         .         .
 17.94     6.4839     4.63  .  Q      .         .         .         .
 18.11     6.5498     4.43  . Q       .         .         .         .
 18.29     6.6077     3.52  . Q       .         .         .         .
 18.46     6.6578     3.37  . Q       .         .         .         .
 18.64     6.7058     3.23  . Q       .         .         .         .
 18.82     6.7520     3.11  . Q       .         .         .         .
 18.99     6.7964     3.00  . Q       .         .         .         .
 19.17     6.8394     2.90  .Q        .         .         .         .
 19.34     6.8809     2.81  .Q        .         .         .         .
 19.52     6.9212     2.73  .Q        .         .         .         .
 19.70     6.9603     2.65  .Q        .         .         .         .
 19.87     6.9984     2.58  .Q        .         .         .         .
 20.05     7.0354     2.51  .Q        .         .         .         .
 20.22     7.0715     2.45  .Q        .         .         .         .
 20.40     7.1068     2.39  .Q        .         .         .         .
 20.58     7.1412     2.34  .Q        .         .         .         .
 20.75     7.1749     2.29  .Q        .         .         .         .
 20.93     7.2079     2.24  .Q        .         .         .         .
 21.10     7.2401     2.20  .Q        .         .         .         .
 21.28     7.2718     2.15  .Q        .         .         .         .
 21.46     7.3028     2.11  .Q        .         .         .         .
 21.63     7.3333     2.08  .Q        .         .         .         .
 21.81     7.3632     2.04  .Q        .         .         .         .
 21.98     7.3926     2.00  .Q        .         .         .         .
 22.16     7.4215     1.97  .Q        .         .         .         .
 22.34     7.4500     1.94  .Q        .         .         .         .
 22.51     7.4780     1.91  .Q        .         .         .         .
 22.69     7.5055     1.88  .Q        .         .         .         .
 22.86     7.5327     1.85  .Q        .         .         .         .
 23.04     7.5594     1.83  .Q        .         .         .         .
 23.22     7.5858     1.80  .Q        .         .         .         .
 23.39     7.6118     1.77  .Q        .         .         .         .
 23.57     7.6374     1.75  .Q        .         .         .         .
 23.74     7.6627     1.73  .Q        .         .         .         .
 23.92     7.6877     1.71  .Q        .         .         .         .
 24.10     7.7123     1.68  .Q        .         .         .         .
 24.27     7.7246     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               Duration
       Peak Flow Rate                    (minutes)
   ======================              =========
             0%                          1446.7
            10%                           264.0
            20%                            63.4
            30%                            21.1
            40%                            10.6
            50%                            10.6
            60%                            10.6
            70%                            10.6
            80%                            10.6
            90%                            10.6
```

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A4
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   95.01
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 25.35
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.42
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    17.90

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.37      0.0042      0.28  .Q        .         .         .         .
  0.79      0.0140      0.28  .Q        .         .         .         .
  1.21      0.0239      0.29  .Q        .         .         .         .
  1.63      0.0340      0.29  .Q        .         .         .         .
  2.06      0.0443      0.30  .Q        .         .         .         .
  2.48      0.0547      0.30  .Q        .         .         .         .
  2.90      0.0653      0.31  .Q        .         .         .         .
  3.32      0.0761      0.31  .Q        .         .         .         .
  3.75      0.0871      0.32  .Q        .         .         .         .
  4.17      0.0983      0.32  .Q        .         .         .         .
  4.59      0.1097      0.33  .Q        .         .         .         .
  5.01      0.1214      0.34  .Q        .         .         .         .
  5.44      0.1333      0.35  .Q        .         .         .         .
  5.86      0.1454      0.35  .Q        .         .         .         .
  6.28      0.1579      0.36  .Q        .         .         .         .
  6.70      0.1706      0.37  .Q        .         .         .         .
  7.13      0.1837      0.38  .Q        .         .         .         .
  7.55      0.1971      0.39  .Q        .         .         .         .
  7.97      0.2108      0.40  .Q        .         .         .         .
  8.39      0.2250      0.41  .Q        .         .         .         .
  8.82      0.2396      0.43  .Q        .         .         .         .
```

```
 9.24      0.2546      0.44  .Q        .         .         .         .
 9.66      0.2702      0.46  .Q        .         .         .         .
10.09      0.2863      0.47  .Q        .         .         .         .
10.51      0.3031      0.49  .Q        .         .         .         .
10.93      0.3206      0.51  . Q       .         .         .         .
11.35      0.3388      0.54  . Q       .         .         .         .
11.77      0.3579      0.56  . Q       .         .         .         .
12.20      0.3785      0.62  . Q       .         .         .         .
12.62      0.4024      0.74  . Q       .         .         .         .
13.04      0.4295      0.80  .  Q      .         .         .         .
13.47      0.4581      0.84  .  Q      .         .         .         .
13.89      0.4890      0.93  .  Q      .         .         .         .
14.31      0.5224      0.98  .  Q      .         .         .         .
14.73      0.5594      1.13  .   Q     .         .         .         .
15.15      0.6010      1.25  .   Q     .         .         .         .
15.58      0.6521      1.68  .     Q   .         .         .         .
16.00      0.7195      2.18  .       Q .         .         .         .
16.42      0.9235      9.51  .         .         .         .       Q .
16.84      1.1142      1.41  .    Q    .         .         .         .
17.27      1.1570      1.05  .   Q     .         .         .         .
17.69      1.1907      0.88  .  Q      .         .         .         .
18.11      1.2195      0.77  .  Q      .         .         .         .
18.53      1.2431      0.58  . Q       .         .         .         .
18.96      1.2623      0.52  . Q       .         .         .         .
19.38      1.2798      0.48  .Q        .         .         .         .
19.80      1.2959      0.45  .Q        .         .         .         .
20.23      1.3110      0.42  .Q        .         .         .         .
20.65      1.3252      0.39  .Q        .         .         .         .
21.07      1.3386      0.37  .Q        .         .         .         .
21.49      1.3513      0.36  .Q        .         .         .         .
21.92      1.3635      0.34  .Q        .         .         .         .
22.34      1.3752      0.33  .Q        .         .         .         .
22.76      1.3864      0.31  .Q        .         .         .         .
23.18      1.3972      0.30  .Q        .         .         .         .
23.61      1.4076      0.29  .Q        .         .         .         .
24.03      1.4177      0.28  .Q        .         .         .         .
24.45      1.4226      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                Duration
       Peak Flow Rate                     (minutes)
   ======================                 =========
              0%                           1445.0
             10%                            202.8
             20%                             50.7
             30%                             25.4
             40%                             25.4
             50%                             25.4
             60%                             25.4
             70%                             25.4
             80%                             25.4
             90%                             25.4
```

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA B
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   68.96
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 19.24
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.17
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    12.85

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.29      0.0024      0.20  Q         .         .         .         .
  0.61      0.0078      0.20  Q         .         .         .         .
  0.93      0.0132      0.21  Q         .         .         .         .
  1.25      0.0187      0.21  Q         .         .         .         .
  1.57      0.0243      0.21  Q         .         .         .         .
  1.89      0.0299      0.21  Q         .         .         .         .
  2.21      0.0356      0.22  Q         .         .         .         .
  2.53      0.0414      0.22  Q         .         .         .         .
  2.85      0.0473      0.22  Q         .         .         .         .
  3.17      0.0532      0.23  Q         .         .         .         .
  3.49      0.0593      0.23  Q         .         .         .         .
  3.81      0.0654      0.23  Q         .         .         .         .
  4.14      0.0716      0.24  Q         .         .         .         .
  4.46      0.0779      0.24  Q         .         .         .         .
  4.78      0.0842      0.24  Q         .         .         .         .
  5.10      0.0907      0.25  Q         .         .         .         .
  5.42      0.0973      0.25  Q         .         .         .         .
  5.74      0.1040      0.25  Q         .         .         .         .
  6.06      0.1108      0.26  Q         .         .         .         .
  6.38      0.1178      0.26  Q         .         .         .         .
  6.70      0.1249      0.27  Q         .         .         .         .
```

```
  7.02      0.1321      0.27  Q         .         .         .         .
  7.34      0.1394      0.28  Q         .         .         .         .
  7.66      0.1469      0.28  Q         .         .         .         .
  7.98      0.1546      0.29  Q         .         .         .         .
  8.30      0.1624      0.30  Q         .         .         .         .
  8.62      0.1704      0.31  Q         .         .         .         .
  8.95      0.1786      0.31  Q         .         .         .         .
  9.27      0.1870      0.32  Q         .         .         .         .
  9.59      0.1956      0.33  Q         .         .         .         .
  9.91      0.2045      0.34  Q         .         .         .         .
 10.23      0.2136      0.35  Q         .         .         .         .
 10.55      0.2230      0.36  Q         .         .         .         .
 10.87      0.2326      0.37  Q         .         .         .         .
 11.19      0.2427      0.39  Q         .         .         .         .
 11.51      0.2530      0.40  Q         .         .         .         .
 11.83      0.2638      0.42  Q         .         .         .         .
 12.15      0.2750      0.43  Q         .         .         .         .
 12.47      0.2880      0.54  .Q        .         .         .         .
 12.79      0.3026      0.56  .Q        .         .         .         .
 13.11      0.3179      0.60  .Q        .         .         .         .
 13.43      0.3340      0.62  .Q        .         .         .         .
 13.76      0.3510      0.66  .Q        .         .         .         .
 14.08      0.3690      0.69  .Q        .         .         .         .
 14.40      0.3883      0.76  .Q        .         .         .         .
 14.72      0.4091      0.81  .Q        .         .         .         .
 15.04      0.4323      0.94  .Q        .         .         .         .
 15.36      0.4584      1.03  . Q       .         .         .         .
 15.68      0.4908      1.41  . Q       .         .         .         .
 16.00      0.5332      1.79  .  Q      .         .         .         .
 16.32      0.7369     13.58  .         .         .      Q  .         .
 16.64      0.9325      1.17  . Q       .         .         .         .
 16.96      0.9595      0.87  .Q        .         .         .         .
 17.28      0.9806      0.73  .Q        .         .         .         .
 17.60      0.9987      0.64  .Q        .         .         .         .
 17.92      1.0148      0.58  .Q        .         .         .         .
 18.24      1.0291      0.51  .Q        .         .         .         .
 18.57      1.0412      0.41  Q         .         .         .         .
 18.89      1.0516      0.38  Q         .         .         .         .
 19.21      1.0613      0.35  Q         .         .         .         .
 19.53      1.0704      0.33  Q         .         .         .         .
 19.85      1.0791      0.32  Q         .         .         .         .
 20.17      1.0873      0.30  Q         .         .         .         .
 20.49      1.0951      0.29  Q         .         .         .         .
 20.81      1.1026      0.28  Q         .         .         .         .
 21.13      1.1098      0.27  Q         .         .         .         .
 21.45      1.1167      0.26  Q         .         .         .         .
 21.77      1.1234      0.25  Q         .         .         .         .
 22.09      1.1299      0.24  Q         .         .         .         .
 22.41      1.1362      0.23  Q         .         .         .         .
 22.73      1.1423      0.23  Q         .         .         .         .
 23.05      1.1483      0.22  Q         .         .         .         .
 23.38      1.1541      0.22  Q         .         .         .         .
 23.70      1.1597      0.21  Q         .         .         .         .
 24.02      1.1652      0.21  Q         .         .         .         .
 24.34      1.1679      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              Duration
        Peak Flow Rate                   (minutes)
    ======================               =========
               0%                         1443.0
              10%                           57.7
              20%                           19.2
              30%                           19.2
              40%                           19.2
```

50%	19.2
60%	19.2
70%	19.2
80%	19.2
90%	19.2

```
******************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA C
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   10.48
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 20.04
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.18
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.96

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.30      0.0004      0.03  Q         .         .         .         .
  0.64      0.0012      0.03  Q         .         .         .         .
  0.97      0.0021      0.03  Q         .         .         .         .
  1.30      0.0030      0.03  Q         .         .         .         .
  1.64      0.0039      0.03  Q         .         .         .         .
  1.97      0.0047      0.03  Q         .         .         .         .
  2.31      0.0057      0.03  Q         .         .         .         .
  2.64      0.0066      0.03  Q         .         .         .         .
  2.97      0.0075      0.03  Q         .         .         .         .
  3.31      0.0085      0.03  Q         .         .         .         .
  3.64      0.0094      0.04  Q         .         .         .         .
  3.98      0.0104      0.04  Q         .         .         .         .
  4.31      0.0114      0.04  Q         .         .         .         .
  4.64      0.0124      0.04  Q         .         .         .         .
  4.98      0.0134      0.04  Q         .         .         .         .
  5.31      0.0144      0.04  Q         .         .         .         .
  5.65      0.0155      0.04  Q         .         .         .         .
  5.98      0.0166      0.04  Q         .         .         .         .
  6.31      0.0177      0.04  Q         .         .         .         .
  6.65      0.0188      0.04  Q         .         .         .         .
  6.98      0.0199      0.04  Q         .         .         .         .
```

```
  7.32      0.0211      0.04  Q          .          .          .          .
  7.65      0.0223      0.04  Q          .          .          .          .
  7.98      0.0235      0.04  Q          .          .          .          .
  8.32      0.0247      0.05  Q          .          .          .          .
  8.65      0.0260      0.05  Q          .          .          .          .
  8.99      0.0273      0.05  Q          .          .          .          .
  9.32      0.0286      0.05  Q          .          .          .          .
  9.65      0.0300      0.05  Q          .          .          .          .
  9.99      0.0314      0.05  Q          .          .          .          .
 10.32      0.0328      0.05  Q          .          .          .          .
 10.66      0.0343      0.05  Q          .          .          .          .
 10.99      0.0359      0.06  Q          .          .          .          .
 11.32      0.0375      0.06  Q          .          .          .          .
 11.66      0.0392      0.06  Q          .          .          .          .
 11.99      0.0409      0.06  Q          .          .          .          .
 12.33      0.0429      0.08  Q          .          .          .          .
 12.66      0.0452      0.08  Q          .          .          .          .
 12.99      0.0475      0.09  Q          .          .          .          .
 13.33      0.0500      0.09  Q          .          .          .          .
 13.66      0.0527      0.10  Q          .          .          .          .
 14.00      0.0555      0.10  Q          .          .          .          .
 14.33      0.0585      0.11  Q          .          .          .          .
 14.66      0.0617      0.12  Q          .          .          .          .
 15.00      0.0653      0.14  Q          .          .          .          .
 15.33      0.0693      0.15  Q          .          .          .          .
 15.67      0.0744      0.21  Q          .          .          .          .
 16.00      0.0810      0.27  .Q         .          .          .          .
 16.33      0.1110      1.91  .      Q   .          .          .          .
 16.67      0.1397      0.17  Q          .          .          .          .
 17.00      0.1438      0.13  Q          .          .          .          .
 17.34      0.1471      0.11  Q          .          .          .          .
 17.67      0.1499      0.10  Q          .          .          .          .
 18.00      0.1524      0.09  Q          .          .          .          .
 18.34      0.1545      0.07  Q          .          .          .          .
 18.67      0.1563      0.06  Q          .          .          .          .
 19.01      0.1579      0.06  Q          .          .          .          .
 19.34      0.1594      0.05  Q          .          .          .          .
 19.67      0.1608      0.05  Q          .          .          .          .
 20.01      0.1621      0.05  Q          .          .          .          .
 20.34      0.1634      0.04  Q          .          .          .          .
 20.68      0.1646      0.04  Q          .          .          .          .
 21.01      0.1658      0.04  Q          .          .          .          .
 21.34      0.1669      0.04  Q          .          .          .          .
 21.68      0.1680      0.04  Q          .          .          .          .
 22.01      0.1690      0.04  Q          .          .          .          .
 22.35      0.1700      0.04  Q          .          .          .          .
 22.68      0.1710      0.03  Q          .          .          .          .
 23.01      0.1719      0.03  Q          .          .          .          .
 23.35      0.1728      0.03  Q          .          .          .          .
 23.68      0.1737      0.03  Q          .          .          .          .
 24.02      0.1746      0.03  Q          .          .          .          .
 24.35      0.1750      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               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
               0%                         1442.9
              10%                           60.1
              20%                           20.0
              30%                           20.0
              40%                           20.0
              50%                           20.0
              60%                           20.0
              70%                           20.0
```

80%	20.0
90%	20.0

```
**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA D
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   17.61
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 16.87
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.31
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     3.27

**************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.25      0.0006      0.05  Q         .         .         .         .
  0.54      0.0018      0.05  Q         .         .         .         .
  0.82      0.0030      0.05  Q         .         .         .         .
  1.10      0.0042      0.05  Q         .         .         .         .
  1.38      0.0055      0.05  Q         .         .         .         .
  1.66      0.0067      0.05  Q         .         .         .         .
  1.94      0.0080      0.05  Q         .         .         .         .
  2.22      0.0093      0.06  Q         .         .         .         .
  2.50      0.0106      0.06  Q         .         .         .         .
  2.79      0.0119      0.06  Q         .         .         .         .
  3.07      0.0132      0.06  Q         .         .         .         .
  3.35      0.0146      0.06  Q         .         .         .         .
  3.63      0.0159      0.06  Q         .         .         .         .
  3.91      0.0173      0.06  Q         .         .         .         .
  4.19      0.0187      0.06  Q         .         .         .         .
  4.47      0.0201      0.06  Q         .         .         .         .
  4.75      0.0215      0.06  Q         .         .         .         .
  5.03      0.0230      0.06  Q         .         .         .         .
  5.32      0.0245      0.06  Q         .         .         .         .
  5.60      0.0260      0.06  Q         .         .         .         .
  5.88      0.0275      0.07  Q         .         .         .         .
```

6.16	0.0290	0.07	Q	.	.	.	.
6.44	0.0306	0.07	Q	.	.	.	.
6.72	0.0322	0.07	Q	.	.	.	.
7.00	0.0338	0.07	Q	.	.	.	.
7.28	0.0354	0.07	Q	.	.	.	.
7.56	0.0371	0.07	Q	.	.	.	.
7.85	0.0388	0.07	Q	.	.	.	.
8.13	0.0406	0.08	Q	.	.	.	.
8.41	0.0423	0.08	Q	.	.	.	.
8.69	0.0441	0.08	Q	.	.	.	.
8.97	0.0460	0.08	Q	.	.	.	.
9.25	0.0479	0.08	Q	.	.	.	.
9.53	0.0498	0.08	Q	.	.	.	.
9.81	0.0518	0.09	Q	.	.	.	.
10.10	0.0538	0.09	Q	.	.	.	.
10.38	0.0559	0.09	Q	.	.	.	.
10.66	0.0580	0.09	Q	.	.	.	.
10.94	0.0602	0.10	Q	.	.	.	.
11.22	0.0625	0.10	Q	.	.	.	.
11.50	0.0648	0.10	Q	.	.	.	.
11.78	0.0672	0.11	Q	.	.	.	.
12.06	0.0697	0.11	Q	.	.	.	.
12.34	0.0726	0.14	Q	.	.	.	.
12.63	0.0758	0.14	Q	.	.	.	.
12.91	0.0792	0.15	Q	.	.	.	.
13.19	0.0827	0.15	Q	.	.	.	.
13.47	0.0863	0.16	Q	.	.	.	.
13.75	0.0901	0.17	Q	.	.	.	.
14.03	0.0942	0.18	Q	.	.	.	.
14.31	0.0985	0.19	Q	.	.	.	.
14.59	0.1030	0.21	Q	.	.	.	.
14.88	0.1080	0.22	Q	.	.	.	.
15.16	0.1135	0.26	.Q	.	.	.	.
15.44	0.1198	0.28	.Q	.	.	.	.
15.72	0.1275	0.38	.Q	.	.	.	.
16.00	0.1376	0.48	.Q	.	.	.	.
16.28	0.1939	4.36	.	.	Q	.	.
16.56	0.2483	0.32	.Q	.	.	.	.
16.84	0.2548	0.24	Q	.	.	.	.
17.12	0.2599	0.20	Q	.	.	.	.
17.41	0.2642	0.17	Q	.	.	.	.
17.69	0.2680	0.16	Q	.	.	.	.
17.97	0.2715	0.14	Q	.	.	.	.
18.25	0.2746	0.12	Q	.	.	.	.
18.53	0.2772	0.10	Q	.	.	.	.
18.81	0.2795	0.10	Q	.	.	.	.
19.09	0.2817	0.09	Q	.	.	.	.
19.37	0.2838	0.09	Q	.	.	.	.
19.66	0.2857	0.08	Q	.	.	.	.
19.94	0.2876	0.08	Q	.	.	.	.
20.22	0.2894	0.08	Q	.	.	.	.
20.50	0.2912	0.07	Q	.	.	.	.
20.78	0.2929	0.07	Q	.	.	.	.
21.06	0.2945	0.07	Q	.	.	.	.
21.34	0.2960	0.07	Q	.	.	.	.
21.62	0.2976	0.06	Q	.	.	.	.
21.90	0.2990	0.06	Q	.	.	.	.
22.19	0.3005	0.06	Q	.	.	.	.
22.47	0.3019	0.06	Q	.	.	.	.
22.75	0.3032	0.06	Q	.	.	.	.
23.03	0.3045	0.06	Q	.	.	.	.
23.31	0.3058	0.06	Q	.	.	.	.
23.59	0.3071	0.05	Q	.	.	.	.
23.87	0.3083	0.05	Q	.	.	.	.
24.15	0.3096	0.05	Q	.	.	.	.
24.43	0.3102	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%	1450.8
10%	33.7
20%	16.9
30%	16.9
40%	16.9
50%	16.9
60%	16.9
70%	16.9
80%	16.9
90%	16.9

Appendix I.IV

Synthetic Unit Hydrograph Method Analysis
Post-Development Conditions
100-Year Storm

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

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

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A1
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   55.00
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.090
    LOW LOSS FRACTION = 0.127
    TIME OF CONCENTRATION(MIN.) = 11.08
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    21.16
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     5.57

******************************************************************************
  TIME     VOLUME       Q    0.       37.5      75.0     112.5     150.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.12      0.0000      0.00  Q         .         .         .         .
  0.30      0.0358      4.69  .Q        .         .         .         .
  0.49      0.1075      4.71  .Q        .         .         .         .
  0.67      0.1798      4.75  .Q        .         .         .         .
  0.86      0.2525      4.77  .Q        .         .         .         .
  1.04      0.3257      4.82  .Q        .         .         .         .
  1.23      0.3993      4.84  .Q        .         .         .         .
  1.41      0.4735      4.88  .Q        .         .         .         .
  1.60      0.5483      4.91  .Q        .         .         .         .
  1.78      0.6235      4.95  .Q        .         .         .         .
  1.97      0.6993      4.98  .Q        .         .         .         .
  2.15      0.7756      5.03  .Q        .         .         .         .
  2.33      0.8525      5.05  .Q        .         .         .         .
  2.52      0.9300      5.10  .Q        .         .         .         .
  2.70      1.0080      5.13  .Q        .         .         .         .
  2.89      1.0867      5.18  .Q        .         .         .         .
  3.07      1.1660      5.21  .Q        .         .         .         .
  3.26      1.2459      5.26  .Q        .         .         .         .
  3.44      1.3264      5.29  .Q        .         .         .         .
  3.63      1.4076      5.35  .Q        .         .         .         .
  3.81      1.4894      5.38  .Q        .         .         .         .
```

```
 4.00     1.5720     5.44  .Q       .        .        .        .
 4.18     1.6552     5.47  .Q       .        .        .        .
 4.37     1.7391     5.53  .Q       .        .        .        .
 4.55     1.8238     5.56  .Q       .        .        .        .
 4.74     1.9093     5.63  .Q       .        .        .        .
 4.92     1.9955     5.67  .Q       .        .        .        .
 5.10     2.0825     5.74  .Q       .        .        .        .
 5.29     2.1703     5.77  .Q       .        .        .        .
 5.47     2.2589     5.85  .Q       .        .        .        .
 5.66     2.3484     5.88  .Q       .        .        .        .
 5.84     2.4388     5.96  .Q       .        .        .        .
 6.03     2.5301     6.00  .Q       .        .        .        .
 6.21     2.6223     6.08  .Q       .        .        .        .
 6.40     2.7155     6.13  .Q       .        .        .        .
 6.58     2.8097     6.21  .Q       .        .        .        .
 6.77     2.9049     6.26  .Q       .        .        .        .
 6.95     3.0011     6.35  .Q       .        .        .        .
 7.14     3.0984     6.40  .Q       .        .        .        .
 7.32     3.1968     6.50  .Q       .        .        .        .
 7.51     3.2964     6.55  .Q       .        .        .        .
 7.69     3.3971     6.66  .Q       .        .        .        .
 7.87     3.4991     6.71  .Q       .        .        .        .
 8.06     3.6024     6.82  .Q       .        .        .        .
 8.24     3.7070     6.88  .Q       .        .        .        .
 8.43     3.8129     7.00  .Q       .        .        .        .
 8.61     3.9203     7.07  .Q       .        .        .        .
 8.80     4.0291     7.20  .Q       .        .        .        .
 8.98     4.1395     7.27  .Q       .        .        .        .
 9.17     4.2514     7.41  .Q       .        .        .        .
 9.35     4.3650     7.48  .Q       .        .        .        .
 9.54     4.4804     7.64  . Q      .        .        .        .
 9.72     4.5975     7.72  . Q      .        .        .        .
 9.91     4.7166     7.88  . Q      .        .        .        .
10.09     4.8376     7.97  . Q      .        .        .        .
10.28     4.9607     8.16  . Q      .        .        .        .
10.46     5.0859     8.25  . Q      .        .        .        .
10.64     5.2134     8.46  . Q      .        .        .        .
10.83     5.3433     8.57  . Q      .        .        .        .
11.01     5.4758     8.79  . Q      .        .        .        .
11.20     5.6109     8.91  . Q      .        .        .        .
11.38     5.7489     9.17  . Q      .        .        .        .
11.57     5.8899     9.30  . Q      .        .        .        .
11.75     6.0340     9.59  . Q      .        .        .        .
11.94     6.1816     9.74  . Q      .        .        .        .
12.12     6.3369    10.61  . Q      .        .        .        .
12.31     6.5043    11.34  .  Q     .        .        .        .
12.49     6.6803    11.72  .  Q     .        .        .        .
12.68     6.8607    11.93  .  Q     .        .        .        .
12.86     7.0462    12.38  .  Q     .        .        .        .
13.05     7.2369    12.62  .  Q     .        .        .        .
13.23     7.4336    13.16  .  Q     .        .        .        .
13.41     7.6367    13.45  .  Q     .        .        .        .
13.60     7.8469    14.10  .  Q     .        .        .        .
13.78     8.0649    14.47  .  Q     .        .        .        .
13.97     8.2919    15.28  .   Q    .        .        .        .
14.15     8.5268    15.50  .   Q    .        .        .        .
14.34     8.7658    15.81  .   Q    .        .        .        .
14.52     9.0119    16.44  .   Q    .        .        .        .
14.71     9.2741    17.92  .   Q    .        .        .        .
14.89     9.5545    18.82  .    Q   .        .        .        .
15.08     9.8591    21.10  .    Q   .        .        .        .
15.26    10.1923    22.57  .     Q  .        .        .        .
15.45    10.5822    28.52  .      Q .        .        .        .
15.63    11.0641    34.64  .       Q.        .        .        .
15.82    11.6846    46.68  .        . Q      .        .        .
16.00    12.5057    60.91  .        .    Q   .        .        .
16.18    14.0594   142.70  .        .        .        .      Q .
16.37    15.4499    39.51  .       Q        .        .        .
16.55    15.9375    24.39  .    Q   .        .        .        .
```

```
 16.74     16.2752     19.87  .    Q    .         .         .         .
 16.92     16.5575     17.13  .   Q     .         .         .         .
 17.11     16.8047     15.26  .   Q     .         .         .         .
 17.29     17.0345     14.86  .  Q      .         .         .         .
 17.48     17.2529     13.76  .  Q      .         .         .         .
 17.66     17.4562     12.88  .  Q      .         .         .         .
 17.85     17.6472     12.15  .  Q      .         .         .         .
 18.03     17.8278     11.52  .  Q      .         .         .         .
 18.22     17.9913      9.91  . Q       .         .         .         .
 18.40     18.1390      9.44  . Q       .         .         .         .
 18.59     18.2800      9.04  . Q       .         .         .         .
 18.77     18.4152      8.68  . Q       .         .         .         .
 18.95     18.5452      8.35  . Q       .         .         .         .
 19.14     18.6704      8.06  . Q       .         .         .         .
 19.32     18.7915      7.80  . Q       .         .         .         .
 19.51     18.9087      7.56  . Q       .         .         .         .
 19.69     19.0223      7.34  .Q        .         .         .         .
 19.88     19.1327      7.13  .Q        .         .         .         .
 20.06     19.2401      6.94  .Q        .         .         .         .
 20.25     19.3447      6.77  .Q        .         .         .         .
 20.43     19.4467      6.60  .Q        .         .         .         .
 20.62     19.5463      6.45  .Q        .         .         .         .
 20.80     19.6436      6.30  .Q        .         .         .         .
 20.99     19.7388      6.17  .Q        .         .         .         .
 21.17     19.8320      6.04  .Q        .         .         .         .
 21.36     19.9233      5.92  .Q        .         .         .         .
 21.54     20.0128      5.81  .Q        .         .         .         .
 21.72     20.1006      5.70  .Q        .         .         .         .
 21.91     20.1868      5.60  .Q        .         .         .         .
 22.09     20.2715      5.50  .Q        .         .         .         .
 22.28     20.3547      5.41  .Q        .         .         .         .
 22.46     20.4366      5.32  .Q        .         .         .         .
 22.65     20.5171      5.23  .Q        .         .         .         .
 22.83     20.5964      5.15  .Q        .         .         .         .
 23.02     20.6745      5.08  .Q        .         .         .         .
 23.20     20.7514      5.00  .Q        .         .         .         .
 23.39     20.8272      4.93  .Q        .         .         .         .
 23.57     20.9019      4.86  .Q        .         .         .         .
 23.76     20.9756      4.80  .Q        .         .         .         .
 23.94     21.0483      4.73  .Q        .         .         .         .
 24.13     21.1200      4.67  .Q        .         .         .         .
 24.31     21.1557      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1440.4
              10%                            221.6
              20%                             55.4
              30%                             33.2
              40%                             22.2
              50%                             11.1
              60%                             11.1
              70%                             11.1
              80%                             11.1
              90%                             11.1
```

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

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A2
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   18.95
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.143
    LOW LOSS FRACTION = 0.178
    TIME OF CONCENTRATION(MIN.) = 11.77
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     6.90
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.30

******************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.11      0.0069      1.51  .Q        .         .         .         .
  0.31      0.0315      1.52  .Q        .         .         .         .
  0.50      0.0562      1.53  .Q        .         .         .         .
  0.70      0.0811      1.54  .Q        .         .         .         .
  0.90      0.1062      1.55  .Q        .         .         .         .
  1.09      0.1314      1.56  .Q        .         .         .         .
  1.29      0.1569      1.58  .Q        .         .         .         .
  1.48      0.1825      1.58  .Q        .         .         .         .
  1.68      0.2083      1.60  .Q        .         .         .         .
  1.88      0.2343      1.61  .Q        .         .         .         .
  2.07      0.2605      1.63  .Q        .         .         .         .
  2.27      0.2870      1.63  .Q        .         .         .         .
  2.46      0.3136      1.65  .Q        .         .         .         .
  2.66      0.3404      1.66  .Q        .         .         .         .
  2.86      0.3675      1.68  .Q        .         .         .         .
  3.05      0.3947      1.69  .Q        .         .         .         .
  3.25      0.4222      1.71  .Q        .         .         .         .
  3.45      0.4500      1.72  .Q        .         .         .         .
  3.64      0.4780      1.74  .Q        .         .         .         .
  3.84      0.5062      1.75  .Q        .         .         .         .
  4.03      0.5347      1.77  .Q        .         .         .         .
```

```
 4.23     0.5634     1.78  .Q       .        .        .        .
 4.43     0.5924     1.80  .Q       .        .        .        .
 4.62     0.6216     1.81  .Q       .        .        .        .
 4.82     0.6512     1.83  .Q       .        .        .        .
 5.01     0.6810     1.85  .Q       .        .        .        .
 5.21     0.7111     1.87  .Q       .        .        .        .
 5.41     0.7415     1.88  .Q       .        .        .        .
 5.60     0.7723     1.91  .Q       .        .        .        .
 5.80     0.8033     1.92  .Q       .        .        .        .
 6.00     0.8347     1.95  .Q       .        .        .        .
 6.19     0.8664     1.96  .Q       .        .        .        .
 6.39     0.8985     1.99  .Q       .        .        .        .
 6.58     0.9309     2.01  .Q       .        .        .        .
 6.78     0.9637     2.04  .Q       .        .        .        .
 6.98     0.9969     2.05  .Q       .        .        .        .
 7.17     1.0305     2.09  .Q       .        .        .        .
 7.37     1.0644     2.10  .Q       .        .        .        .
 7.56     1.0989     2.14  .Q       .        .        .        .
 7.76     1.1337     2.16  .Q       .        .        .        .
 7.96     1.1690     2.20  .Q       .        .        .        .
 8.15     1.2048     2.22  .Q       .        .        .        .
 8.35     1.2411     2.26  .Q       .        .        .        .
 8.55     1.2778     2.28  .Q       .        .        .        .
 8.74     1.3152     2.32  .Q       .        .        .        .
 8.94     1.3530     2.35  .Q       .        .        .        .
 9.13     1.3915     2.40  .Q       .        .        .        .
 9.33     1.4305     2.42  .Q       .        .        .        .
 9.53     1.4702     2.47  .Q       .        .        .        .
 9.72     1.5105     2.50  . Q      .        .        .        .
 9.92     1.5515     2.56  . Q      .        .        .        .
10.11     1.5932     2.59  . Q      .        .        .        .
10.31     1.6357     2.65  . Q      .        .        .        .
10.51     1.6790     2.69  . Q      .        .        .        .
10.70     1.7232     2.76  . Q      .        .        .        .
10.90     1.7682     2.80  . Q      .        .        .        .
11.10     1.8142     2.88  . Q      .        .        .        .
11.29     1.8611     2.92  . Q      .        .        .        .
11.49     1.9092     3.01  . Q      .        .        .        .
11.68     1.9584     3.06  . Q      .        .        .        .
11.88     2.0087     3.16  . Q      .        .        .        .
12.08     2.0604     3.22  . Q      .        .        .        .
12.27     2.1164     3.69  . Q      .        .        .        .
12.47     2.1767     3.75  .  Q     .        .        .        .
12.67     2.2387     3.89  .  Q     .        .        .        .
12.86     2.3024     3.97  .  Q     .        .        .        .
13.06     2.3682     4.14  .  Q     .        .        .        .
13.25     2.4360     4.23  .  Q     .        .        .        .
13.45     2.5063     4.44  .  Q     .        .        .        .
13.65     2.5791     4.55  .  Q     .        .        .        .
13.84     2.6550     4.81  .  Q     .        .        .        .
14.04     2.7341     4.95  .  Q     .        .        .        .
14.23     2.8145     4.97  .  Q     .        .        .        .
14.43     2.8966     5.16  .   Q    .        .        .        .
14.63     2.9841     5.63  .   Q    .        .        .        .
14.82     3.0776     5.91  .   Q    .        .        .        .
15.02     3.1792     6.63  .    Q   .        .        .        .
15.22     3.2904     7.09  .    Q   .        .        .        .
15.41     3.4169     8.52  .     Q  .        .        .        .
15.61     3.5733    10.77  .       Q.        .        .        .
15.80     3.7799    14.72  .         .Q      .        .        .
16.00     4.0569    19.45  .         .    Q  .        .        .
16.20     4.5943    46.84  .         .       .        .     Q  .
16.39     5.0736    12.29  .        Q.       .        .        .
16.59     5.2353     7.66  .     Q   .       .        .        .
16.78     5.3480     6.24  .   Q     .       .        .        .
16.98     5.4422     5.38  .   Q     .       .        .        .
17.18     5.5265     5.02  .   Q     .       .        .        .
17.37     5.6051     4.67  .  Q      .       .        .        .
17.57     5.6781     4.33  .  Q      .       .        .        .
```

17.77	5.7460	4.05	. Q	.	.	.	.
17.96	5.8098	3.82	. Q	.	.	.	.
18.16	5.8690	3.48	. Q	.	.	.	.
18.35	5.9224	3.11	. Q	.	.	.	.
18.55	5.9716	2.96	. Q	.	.	.	.
18.75	6.0186	2.84	. Q	.	.	.	.
18.94	6.0637	2.72	. Q	.	.	.	.
19.14	6.1070	2.62	. Q	.	.	.	.
19.33	6.1487	2.53	. Q	.	.	.	.
19.53	6.1891	2.45	.Q	.	.	.	.
19.73	6.2281	2.37	.Q	.	.	.	.
19.92	6.2660	2.30	.Q	.	.	.	.
20.12	6.3028	2.24	.Q	.	.	.	.
20.32	6.3385	2.18	.Q	.	.	.	.
20.51	6.3734	2.12	.Q	.	.	.	.
20.71	6.4074	2.07	.Q	.	.	.	.
20.90	6.4406	2.02	.Q	.	.	.	.
21.10	6.4730	1.98	.Q	.	.	.	.
21.30	6.5047	1.94	.Q	.	.	.	.
21.49	6.5358	1.90	.Q	.	.	.	.
21.69	6.5662	1.86	.Q	.	.	.	.
21.89	6.5960	1.82	.Q	.	.	.	.
22.08	6.6253	1.79	.Q	.	.	.	.
22.28	6.6540	1.76	.Q	.	.	.	.
22.47	6.6823	1.73	.Q	.	.	.	.
22.67	6.7100	1.70	.Q	.	.	.	.
22.87	6.7373	1.67	.Q	.	.	.	.
23.06	6.7641	1.64	.Q	.	.	.	.
23.26	6.7905	1.62	.Q	.	.	.	.
23.45	6.8165	1.59	.Q	.	.	.	.
23.65	6.8422	1.57	.Q	.	.	.	.
23.85	6.8674	1.55	.Q	.	.	.	.
24.04	6.8923	1.53	.Q	.	.	.	.
24.24	6.9047	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%	1447.7
10%	211.9
20%	58.9
30%	35.3
40%	23.5
50%	11.8
60%	11.8
70%	11.8
80%	11.8
90%	11.8

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A3
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   57.97
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.085
    LOW LOSS FRACTION = 0.123
    TIME OF CONCENTRATION(MIN.) = 10.56
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    22.44
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     5.72

******************************************************************************
  TIME     VOLUME       Q    0.       40.0      80.0     120.0     160.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.16      0.0359      4.94  .Q        .         .         .         .
  0.34      0.1080      4.97  .Q        .         .         .         .
  0.51      0.1805      4.99  .Q        .         .         .         .
  0.69      0.2535      5.04  .Q        .         .         .         .
  0.86      0.3269      5.06  .Q        .         .         .         .
  1.04      0.4008      5.10  .Q        .         .         .         .
  1.22      0.4751      5.12  .Q        .         .         .         .
  1.39      0.5500      5.17  .Q        .         .         .         .
  1.57      0.6253      5.19  .Q        .         .         .         .
  1.74      0.7012      5.24  .Q        .         .         .         .
  1.92      0.7776      5.26  .Q        .         .         .         .
  2.10      0.8545      5.31  .Q        .         .         .         .
  2.27      0.9319      5.34  .Q        .         .         .         .
  2.45      1.0099      5.39  .Q        .         .         .         .
  2.62      1.0885      5.41  .Q        .         .         .         .
  2.80      1.1676      5.47  .Q        .         .         .         .
  2.98      1.2473      5.49  .Q        .         .         .         .
  3.15      1.3276      5.55  .Q        .         .         .         .
  3.33      1.4085      5.58  .Q        .         .         .         .
  3.50      1.4900      5.63  .Q        .         .         .         .
  3.68      1.5722      5.66  .Q        .         .         .         .
```

3.86	1.6550	5.72	.Q . . . .
4.03	1.7384	5.75	.Q . . . .
4.21	1.8226	5.82	.Q . . . .
4.38	1.9074	5.85	.Q . . . .
4.56	1.9930	5.91	.Q . . . .
4.74	2.0792	5.95	.Q . . . .
4.91	2.1662	6.02	.Q . . . .
5.09	2.2540	6.05	.Q . . . .
5.26	2.3426	6.12	.Q . . . .
5.44	2.4319	6.16	.Q . . . .
5.62	2.5221	6.24	.Q . . . .
5.79	2.6131	6.28	.Q . . . .
5.97	2.7050	6.36	.Q . . . .
6.14	2.7978	6.40	.Q . . . .
6.32	2.8915	6.48	.Q . . . .
6.50	2.9861	6.53	.Q . . . .
6.67	3.0816	6.62	.Q . . . .
6.85	3.1782	6.66	.Q . . . .
7.02	3.2758	6.76	.Q . . . .
7.20	3.3745	6.81	.Q . . . .
7.38	3.4742	6.91	.Q . . . .
7.55	3.5750	6.96	.Q . . . .
7.73	3.6771	7.07	.Q . . . .
7.90	3.7803	7.12	.Q . . . .
8.08	3.8847	7.24	.Q . . . .
8.26	3.9904	7.30	.Q . . . .
8.43	4.0974	7.42	.Q . . . .
8.61	4.2058	7.48	.Q . . . .
8.78	4.3156	7.62	.Q . . . .
8.96	4.4269	7.68	.Q . . . .
9.14	4.5397	7.83	.Q . . . .
9.31	4.6541	7.90	.Q . . . .
9.49	4.7701	8.06	. Q . . . .
9.66	4.8879	8.14	. Q . . . .
9.84	5.0075	8.30	. Q . . . .
10.02	5.1289	8.39	. Q . . . .
10.19	5.2523	8.57	. Q . . . .
10.37	5.3777	8.67	. Q . . . .
10.54	5.5053	8.87	. Q . . . .
10.72	5.6351	8.98	. Q . . . .
10.90	5.7672	9.20	. Q . . . .
11.07	5.9019	9.32	. Q . . . .
11.25	6.0392	9.56	. Q . . . .
11.42	6.1792	9.69	. Q . . . .
11.60	6.3222	9.97	. Q . . . .
11.78	6.4683	10.12	. Q . . . .
11.95	6.6178	10.43	. Q . . . .
12.13	6.7715	10.70	. Q . . . .
12.30	6.9373	12.11	. Q . . . .
12.48	7.1148	12.30	. Q . . . .
12.66	7.2968	12.72	. Q . . . .
12.83	7.4834	12.94	. Q . . . .
13.01	7.6752	13.43	. Q . . . .
13.18	7.8724	13.69	. Q . . . .
13.36	8.0758	14.27	. Q . . . .
13.54	8.2858	14.59	. Q . . . .
13.71	8.5032	15.30	. Q . . . .
13.89	8.7286	15.69	. Q . . . .
14.06	8.9630	16.53	. Q . . . .
14.24	9.1998	16.03	. Q . . . .
14.42	9.4414	17.18	. Q . . . .
14.59	9.6962	17.86	. Q . . . .
14.77	9.9677	19.47	. Q . . . .
14.94	10.2581	20.45	. Q . . . .
15.12	10.5736	22.93	. Q . . . .
15.30	10.9187	24.53	. Q . . . .
15.47	11.3317	32.25	. Q . . . .
15.65	11.8404	37.70	. Q. . . .
15.82	12.4827	50.62	. . Q . . .

```
  16.00     13.3310     66.04  .         .     Q   .         .         .
  16.18     14.9328    154.21  .         .         .         .       Q .
  16.35     16.3667     42.95  .         Q         .         .         .
  16.53     16.8718     26.50  .     Q   .         .         .         .
  16.70     17.2215     21.59  .    Q    .         .         .         .
  16.88     17.5140     18.62  .   Q     .         .         .         .
  17.06     17.7699     16.58  .   Q     .         .         .         .
  17.23     18.0077     16.12  .   Q     .         .         .         .
  17.41     18.2336     14.93  .  Q      .         .         .         .
  17.58     18.4438     13.98  .  Q      .         .         .         .
  17.76     18.6413     13.18  .  Q      .         .         .         .
  17.94     18.8281     12.50  .  Q      .         .         .         .
  18.11     19.0057     11.92  . Q       .         .         .         .
  18.29     19.1671     10.27  . Q       .         .         .         .
  18.46     19.3133      9.83  . Q       .         .         .         .
  18.64     19.4534      9.44  . Q       .         .         .         .
  18.82     19.5881      9.09  . Q       .         .         .         .
  18.99     19.7180      8.77  . Q       .         .         .         .
  19.17     19.8434      8.48  . Q       .         .         .         .
  19.34     19.9649      8.22  . Q       .         .         .         .
  19.52     20.0827      7.98  .Q        .         .         .         .
  19.70     20.1971      7.75  .Q        .         .         .         .
  19.87     20.3084      7.55  .Q        .         .         .         .
  20.05     20.4168      7.36  .Q        .         .         .         .
  20.22     20.5225      7.18  .Q        .         .         .         .
  20.40     20.6257      7.01  .Q        .         .         .         .
  20.58     20.7266      6.86  .Q        .         .         .         .
  20.75     20.8253      6.71  .Q        .         .         .         .
  20.93     20.9218      6.57  .Q        .         .         .         .
  21.10     21.0165      6.44  .Q        .         .         .         .
  21.28     21.1092      6.32  .Q        .         .         .         .
  21.46     21.2003      6.20  .Q        .         .         .         .
  21.63     21.2896      6.09  .Q        .         .         .         .
  21.81     21.3774      5.98  .Q        .         .         .         .
  21.98     21.4637      5.88  .Q        .         .         .         .
  22.16     21.5485      5.78  .Q        .         .         .         .
  22.34     21.6320      5.69  .Q        .         .         .         .
  22.51     21.7142      5.60  .Q        .         .         .         .
  22.69     21.7951      5.52  .Q        .         .         .         .
  22.86     21.8748      5.44  .Q        .         .         .         .
  23.04     21.9533      5.36  .Q        .         .         .         .
  23.22     22.0308      5.29  .Q        .         .         .         .
  23.39     22.1072      5.22  .Q        .         .         .         .
  23.57     22.1825      5.15  .Q        .         .         .         .
  23.74     22.2569      5.08  .Q        .         .         .         .
  23.92     22.3303      5.02  .Q        .         .         .         .
  24.10     22.4028      4.95  .Q        .         .         .         .
  24.27     22.4388      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               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
              0%                          1446.7
             10%                           211.2
             20%                            63.4
             30%                            31.7
             40%                            21.1
             50%                            10.6
             60%                            10.6
             70%                            10.6
             80%                            10.6
             90%                            10.6
```

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

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                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A4
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   95.01
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 24.47
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    35.78
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    10.38

******************************************************************************
  TIME     VOLUME       Q    0.       40.0      80.0     120.0     160.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.09      0.0000      0.00  Q         .         .         .         .
  0.50      0.1342      7.96  .Q        .         .         .         .
  0.91      0.4052      8.11  . Q       .         .         .         .
  1.32      0.6801      8.20  . Q       .         .         .         .
  1.73      0.9591      8.36  . Q       .         .         .         .
  2.13      1.2426      8.45  . Q       .         .         .         .
  2.54      1.5306      8.64  . Q       .         .         .         .
  2.95      1.8233      8.73  . Q       .         .         .         .
  3.36      2.1211      8.94  . Q       .         .         .         .
  3.77      2.4241      9.04  . Q       .         .         .         .
  4.17      2.7326      9.27  . Q       .         .         .         .
  4.58      3.0469      9.38  . Q       .         .         .         .
  4.99      3.3674      9.63  . Q       .         .         .         .
  5.40      3.6943      9.76  . Q       .         .         .         .
  5.80      4.0281     10.04  . Q       .         .         .         .
  6.21      4.3691     10.19  . Q       .         .         .         .
  6.62      4.7179     10.51  . Q       .         .         .         .
  7.03      5.0749     10.67  . Q       .         .         .         .
  7.44      5.4407     11.04  . Q       .         .         .         .
  7.84      5.8159     11.23  . Q       .         .         .         .
  8.25      6.2014     11.65  . Q       .         .         .         .
```

```
 8.66     6.5978    11.87  . Q       .         .         .         .
 9.07     7.0061    12.36  .  Q      .         .         .         .
 9.47     7.4273    12.63  .  Q      .         .         .         .
 9.88     7.8628    13.22  .  Q      .         .         .         .
10.29     8.3137    13.54  .  Q      .         .         .         .
10.70     8.7821    14.26  .  Q      .         .         .         .
11.11     9.2695    14.66  .  Q      .         .         .         .
11.51     9.7789    15.57  .  Q      .         .         .         .
11.92    10.3124    16.09  .   Q     .         .         .         .
12.33    10.8970    18.60  .   Q     .         .         .         .
12.74    11.5449    19.84  .   Q     .         .         .         .
13.15    12.2420    21.53  .    Q    .         .         .         .
13.55    12.9847    22.55  .    Q    .         .         .         .
13.96    13.7878    25.11  .     Q   .         .         .         .
14.37    14.6516    26.15  .     Q   .         .         .         .
14.78    15.5918    29.64  .      Q  .         .         .         .
15.18    16.6481    33.04  .       Q .         .         .         .
15.59    18.0291    48.91  .         . Q       .         .         .
16.00    19.9918    67.56  .         .     Q   .         .         .
16.41    23.8236   159.82  .         .         .         .        Q.
16.82    27.1553    37.88  .        Q.         .         .         .
17.22    28.2499    27.08  .     Q   .         .         .         .
17.63    29.1060    23.72  .    Q    .         .         .         .
18.04    29.8535    20.63  .    Q    .         .         .         .
18.45    30.4819    16.66  .   Q     .         .         .         .
18.85    31.0171    15.10  .  Q      .         .         .         .
19.26    31.5055    13.89  .  Q      .         .         .         .
19.67    31.9571    12.91  .  Q      .         .         .         .
20.08    32.3788    12.11  .  Q      .         .         .         .
20.49    32.7755    11.43  . Q       .         .         .         .
20.89    33.1510    10.85  . Q       .         .         .         .
21.30    33.5082    10.35  . Q       .         .         .         .
21.71    33.8494     9.90  . Q       .         .         .         .
22.12    34.1765     9.51  . Q       .         .         .         .
22.53    34.4909     9.15  . Q       .         .         .         .
22.93    34.7940     8.83  . Q       .         .         .         .
23.34    35.0869     8.54  . Q       .         .         .         .
23.75    35.3704     8.28  . Q       .         .         .         .
24.16    35.6453     8.04  . Q       .         .         .         .
24.56    35.7807     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               Duration
       Peak Flow Rate                    (minutes)
   ======================              =========
             0%                          1443.7
            10%                           416.0
            20%                           122.3
            30%                            73.4
            40%                            48.9
            50%                            24.5
            60%                            24.5
            70%                            24.5
            80%                            24.5
            90%                            24.5
```

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
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 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA B
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   68.96
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 15.21
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    25.99
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     7.51

******************************************************************************
  TIME     VOLUME       Q    0.       37.5      75.0     112.5     150.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.03      0.0000      0.00  Q         .         .         .         .
  0.28      0.0604      5.77  .Q        .         .         .         .
  0.54      0.1820      5.83  .Q        .         .         .         .
  0.79      0.3045      5.87  .Q        .         .         .         .
  1.04      0.4282      5.94  .Q        .         .         .         .
  1.30      0.5531      5.98  .Q        .         .         .         .
  1.55      0.6791      6.05  .Q        .         .         .         .
  1.80      0.8063      6.09  .Q        .         .         .         .
  2.06      0.9349      6.17  .Q        .         .         .         .
  2.31      1.0646      6.22  .Q        .         .         .         .
  2.56      1.1957      6.30  .Q        .         .         .         .
  2.82      1.3282      6.34  .Q        .         .         .         .
  3.07      1.4621      6.44  .Q        .         .         .         .
  3.33      1.5974      6.48  .Q        .         .         .         .
  3.58      1.7342      6.58  .Q        .         .         .         .
  3.83      1.8725      6.63  .Q        .         .         .         .
  4.09      2.0125      6.73  .Q        .         .         .         .
  4.34      2.1540      6.78  .Q        .         .         .         .
  4.59      2.2973      6.89  .Q        .         .         .         .
  4.85      2.4423      6.95  .Q        .         .         .         .
  5.10      2.5891      7.07  .Q        .         .         .         .
```

5.35	2.7378	7.13	.Q . . . .
5.61	2.8884	7.25	.Q . . . .
5.86	3.0410	7.32	.Q . . . .
6.11	3.1958	7.45	.Q . . . .
6.37	3.3527	7.52	. Q . . . .
6.62	3.5119	7.67	. Q . . . .
6.87	3.6734	7.75	. Q . . . .
7.13	3.8374	7.91	. Q . . . .
7.38	4.0039	7.99	. Q . . . .
7.63	4.1732	8.17	. Q . . . .
7.89	4.3452	8.26	. Q . . . .
8.14	4.5202	8.45	. Q . . . .
8.40	4.6983	8.55	. Q . . . .
8.65	4.8796	8.76	. Q . . . .
8.90	5.0643	8.87	. Q . . . .
9.16	5.2526	9.11	. Q . . . .
9.41	5.4447	9.23	. Q . . . .
9.66	5.6409	9.50	. Q . . . .
9.92	5.8413	9.64	. Q . . . .
10.17	6.0463	9.93	. Q . . . .
10.42	6.2560	10.09	. Q . . . .
10.68	6.4710	10.43	. Q . . . .
10.93	6.6915	10.62	. Q . . . .
11.18	6.9181	11.01	. Q . . . .
11.44	7.1510	11.22	. Q . . . .
11.69	7.3910	11.69	. Q . . . .
11.94	7.6384	11.94	. Q . . . .
12.20	7.9038	13.39	. Q . . . .
12.45	8.1922	14.14	. Q . . . .
12.70	8.4957	14.83	. Q . . . .
12.96	8.8103	15.21	. Q . . . .
13.21	9.1380	16.07	. Q . . . .
13.47	9.4798	16.56	. Q . . . .
13.72	9.8384	17.68	. Q . . . .
13.97	10.2157	18.34	. Q . . . .
14.23	10.6054	18.86	. Q . . . .
14.48	11.0083	19.60	. Q . . . .
14.73	11.4438	21.97	. Q . . . .
14.99	11.9201	23.50	. Q . . . .
15.24	12.4574	27.80	. Q . . . .
15.49	13.0732	30.99	. Q . . . .
15.75	13.9002	47.95	. . Q . . . .
16.00	15.0389	60.76	. . Q . . . .
16.25	17.2238	147.82	. . . . . Q.
16.51	19.1979	40.63	. Q . . . .
16.76	19.8895	25.39	. Q . . . .
17.01	20.3722	20.69	. Q . . . .
17.27	20.7887	19.07	. Q . . . .
17.52	21.1674	17.09	. Q . . . .
17.77	21.5101	15.62	. Q . . . .
18.03	21.8254	14.47	. Q . . . .
18.28	22.1049	12.21	. Q . . . .
18.53	22.3527	11.45	. Q . . . .
18.79	22.5858	10.81	. Q . . . .
19.04	22.8065	10.26	. Q . . . .
19.30	23.0164	9.78	. Q . . . .
19.55	23.2169	9.36	. Q . . . .
19.80	23.4091	8.99	. Q . . . .
20.06	23.5939	8.65	. Q . . . .
20.31	23.7721	8.35	. Q . . . .
20.56	23.9441	8.08	. Q . . . .
20.82	24.1107	7.83	. Q . . . .
21.07	24.2723	7.60	. Q . . . .
21.32	24.4293	7.39	.Q . . . .
21.58	24.5819	7.19	.Q . . . .
21.83	24.7306	7.01	.Q . . . .
22.08	24.8757	6.84	.Q . . . .
22.34	25.0173	6.68	.Q . . . .
22.59	25.1556	6.53	.Q . . . .

```
  22.84     25.2910      6.39  .Q        .         .         .         .
  23.10     25.4234      6.26  .Q        .         .         .         .
  23.35     25.5532      6.13  .Q        .         .         .         .
  23.61     25.6805      6.02  .Q        .         .         .         .
  23.86     25.8054      5.90  .Q        .         .         .         .
  24.11     25.9279      5.80  .Q        .         .         .         .
  24.37     25.9887      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1444.9
              10%                            319.4
              20%                             76.1
              30%                             45.6
              40%                             30.4
              50%                             15.2
              60%                             15.2
              70%                             15.2
              80%                             15.2
              90%                             15.2
```

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

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA C
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   10.48
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.180
    LOW LOSS FRACTION = 0.140
    TIME OF CONCENTRATION(MIN.) = 15.98
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     3.96
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.13

******************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.02      0.0000      0.00  Q         .         .         .         .
  0.29      0.0097      0.88  .Q        .         .         .         .
  0.55      0.0291      0.88  .Q        .         .         .         .
  0.82      0.0486      0.90  .Q        .         .         .         .
  1.09      0.0684      0.90  .Q        .         .         .         .
  1.35      0.0884      0.91  .Q        .         .         .         .
  1.62      0.1085      0.92  .Q        .         .         .         .
  1.88      0.1289      0.93  .Q        .         .         .         .
  2.15      0.1495      0.94  .Q        .         .         .         .
  2.42      0.1703      0.95  .Q        .         .         .         .
  2.68      0.1913      0.96  .Q        .         .         .         .
  2.95      0.2125      0.97  .Q        .         .         .         .
  3.22      0.2340      0.98  .Q        .         .         .         .
  3.48      0.2558      1.00  .Q        .         .         .         .
  3.75      0.2778      1.00  .Q        .         .         .         .
  4.02      0.3000      1.02  .Q        .         .         .         .
  4.28      0.3225      1.03  .Q        .         .         .         .
  4.55      0.3453      1.04  .Q        .         .         .         .
  4.81      0.3684      1.05  .Q        .         .         .         .
  5.08      0.3918      1.07  .Q        .         .         .         .
  5.35      0.4156      1.08  .Q        .         .         .         .
```

```
 5.61     0.4396     1.10  .Q       .        .        .        .
 5.88     0.4640     1.11  .Q       .        .        .        .
 6.15     0.4887     1.13  .Q       .        .        .        .
 6.41     0.5138     1.15  .Q       .        .        .        .
 6.68     0.5393     1.17  .Q       .        .        .        .
 6.94     0.5651     1.18  .Q       .        .        .        .
 7.21     0.5914     1.21  .Q       .        .        .        .
 7.48     0.6181     1.22  .Q       .        .        .        .
 7.74     0.6453     1.25  .Q       .        .        .        .
 8.01     0.6730     1.26  .Q       .        .        .        .
 8.28     0.7012     1.30  .Q       .        .        .        .
 8.54     0.7298     1.31  .Q       .        .        .        .
 8.81     0.7591     1.35  .Q       .        .        .        .
 9.08     0.7889     1.36  .Q       .        .        .        .
 9.34     0.8194     1.40  .Q       .        .        .        .
 9.61     0.8505     1.42  .Q       .        .        .        .
 9.87     0.8824     1.47  .Q       .        .        .        .
10.14     0.9150     1.49  .Q       .        .        .        .
10.41     0.9484     1.54  . Q      .        .        .        .
10.67     0.9826     1.57  . Q      .        .        .        .
10.94     1.0178     1.63  . Q      .        .        .        .
11.21     1.0540     1.66  . Q      .        .        .        .
11.47     1.0913     1.73  . Q      .        .        .        .
11.74     1.1297     1.77  . Q      .        .        .        .
12.01     1.1695     1.85  . Q      .        .        .        .
12.27     1.2118     2.00  . Q      .        .        .        .
12.54     1.2580     2.20  . Q      .        .        .        .
12.80     1.3070     2.25  .  Q     .        .        .        .
13.07     1.3580     2.38  .  Q     .        .        .        .
13.34     1.4113     2.45  .  Q     .        .        .        .
13.60     1.4671     2.62  .  Q     .        .        .        .
13.87     1.5258     2.72  .  Q     .        .        .        .
14.14     1.5877     2.90  .  Q     .        .        .        .
14.40     1.6515     2.90  .  Q     .        .        .        .
14.67     1.7192     3.25  .   Q    .        .        .        .
14.93     1.7932     3.48  .   Q    .        .        .        .
15.20     1.8768     4.11  .    Q   .        .        .        .
15.47     1.9725     4.59  .     Q  .        .        .        .
15.73     2.1014     7.12  .        Q.       .        .        .
16.00     2.2791     9.03  .         . Q     .        .        .
16.27     2.6197    21.91  .         .       .       Q.        .
16.53     2.9255     5.88  .      Q  .       .        .        .
16.80     3.0315     3.76  .    Q    .       .        .        .
17.07     3.1066     3.06  .   Q     .       .        .        .
17.33     3.1714     2.83  .  Q      .       .        .        .
17.60     3.2303     2.53  .  Q      .       .        .        .
17.86     3.2837     2.32  .  Q      .       .        .        .
18.13     3.3328     2.15  . Q       .       .        .        .
18.40     3.3763     1.81  . Q       .       .        .        .
18.66     3.4148     1.69  . Q       .       .        .        .
18.93     3.4510     1.60  . Q       .       .        .        .
19.20     3.4853     1.52  . Q       .       .        .        .
19.46     3.5179     1.45  .Q        .       .        .        .
19.73     3.5490     1.38  .Q        .       .        .        .
19.99     3.5789     1.33  .Q        .       .        .        .
20.26     3.6076     1.28  .Q        .       .        .        .
20.53     3.6352     1.23  .Q        .       .        .        .
20.79     3.6620     1.19  .Q        .       .        .        .
21.06     3.6879     1.16  .Q        .       .        .        .
21.33     3.7130     1.12  .Q        .       .        .        .
21.59     3.7373     1.09  .Q        .       .        .        .
21.86     3.7610     1.06  .Q        .       .        .        .
22.13     3.7841     1.04  .Q        .       .        .        .
22.39     3.8067     1.01  .Q        .       .        .        .
22.66     3.8287     0.99  .Q        .       .        .        .
22.92     3.8502     0.97  .Q        .       .        .        .
23.19     3.8712     0.94  .Q        .       .        .        .
23.46     3.8918     0.93  .Q        .       .        .        .
23.72     3.9119     0.91  .Q        .       .        .        .
```

```
  23.99      3.9317      0.89  .Q        .         .         .         .
  24.26      3.9511      0.88  .Q        .         .         .         .
  24.52      3.9608      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                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1454.2
              10%                            335.6
              20%                             79.9
              30%                             47.9
              40%                             32.0
              50%                             16.0
              60%                             16.0
              70%                             16.0
              80%                             16.0
              90%                             16.0
```

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

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  UNIT HYDROGRAPH
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA D
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   17.61
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.666
    LOW LOSS FRACTION = 0.927
    TIME OF CONCENTRATION(MIN.) = 15.41
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.32
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     7.23

******************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.08      0.0000      0.00  Q         .         .         .         .
  0.33      0.0013      0.13  Q         .         .         .         .
  0.59      0.0040      0.13  Q         .         .         .         .
  0.85      0.0067      0.13  Q         .         .         .         .
  1.10      0.0094      0.13  Q         .         .         .         .
  1.36      0.0122      0.13  Q         .         .         .         .
  1.62      0.0149      0.13  Q         .         .         .         .
  1.87      0.0177      0.13  Q         .         .         .         .
  2.13      0.0206      0.13  Q         .         .         .         .
  2.39      0.0234      0.14  Q         .         .         .         .
  2.64      0.0263      0.14  Q         .         .         .         .
  2.90      0.0292      0.14  Q         .         .         .         .
  3.16      0.0322      0.14  Q         .         .         .         .
  3.42      0.0352      0.14  Q         .         .         .         .
  3.67      0.0382      0.14  Q         .         .         .         .
  3.93      0.0412      0.14  Q         .         .         .         .
  4.19      0.0443      0.15  Q         .         .         .         .
  4.44      0.0475      0.15  Q         .         .         .         .
  4.70      0.0506      0.15  Q         .         .         .         .
  4.96      0.0538      0.15  Q         .         .         .         .
  5.21      0.0571      0.15  Q         .         .         .         .
```

5.47	0.0603	0.16	Q	.	.	.	.
5.73	0.0637	0.16	Q	.	.	.	.
5.98	0.0670	0.16	Q	.	.	.	.
6.24	0.0705	0.16	Q	.	.	.	.
6.50	0.0739	0.17	Q	.	.	.	.
6.75	0.0775	0.17	Q	.	.	.	.
7.01	0.0810	0.17	Q	.	.	.	.
7.27	0.0847	0.17	Q	.	.	.	.
7.52	0.0884	0.18	Q	.	.	.	.
7.78	0.0921	0.18	Q	.	.	.	.
8.04	0.0959	0.18	Q	.	.	.	.
8.30	0.0998	0.18	Q	.	.	.	.
8.55	0.1038	0.19	Q	.	.	.	.
8.81	0.1078	0.19	Q	.	.	.	.
9.07	0.1119	0.20	Q	.	.	.	.
9.32	0.1161	0.20	Q	.	.	.	.
9.58	0.1204	0.20	Q	.	.	.	.
9.84	0.1247	0.21	Q	.	.	.	.
10.09	0.1292	0.21	Q	.	.	.	.
10.35	0.1338	0.22	Q	.	.	.	.
10.61	0.1385	0.22	Q	.	.	.	.
10.86	0.1433	0.23	Q	.	.	.	.
11.12	0.1482	0.24	Q	.	.	.	.
11.38	0.1533	0.24	Q	.	.	.	.
11.63	0.1585	0.25	Q	.	.	.	.
11.89	0.1639	0.26	Q	.	.	.	.
12.15	0.1696	0.28	Q	.	.	.	.
12.40	0.1758	0.30	Q	.	.	.	.
12.66	0.1824	0.32	Q	.	.	.	.
12.92	0.1893	0.33	Q	.	.	.	.
13.17	0.1964	0.35	Q	.	.	.	.
13.43	0.2039	0.36	Q	.	.	.	.
13.69	0.2117	0.38	Q	.	.	.	.
13.95	0.2199	0.39	Q	.	.	.	.
14.20	0.2285	0.41	Q	.	.	.	.
14.46	0.2373	0.42	Q	.	.	.	.
14.72	0.2468	0.47	Q	.	.	.	.
14.97	0.2572	0.51	Q	.	.	.	.
15.23	0.2689	0.60	Q	.	.	.	.
15.49	0.2823	0.67	Q	.	.	.	.
15.74	0.3276	3.60	.	Q	.	.	.	.
16.00	0.4441	7.38	.	.	Q.	.	.	.
16.26	0.8387	29.80	.	.	.	.	.	Q.
16.51	1.1693	1.35	.Q	.	.	.	.	.
16.77	1.1894	0.55	Q	.	.	.	.	.
17.03	1.1999	0.45	Q	.	.	.	.	.
17.28	1.2090	0.41	Q	.	.	.	.	.
17.54	1.2173	0.37	Q	.	.	.	.	.
17.80	1.2248	0.34	Q	.	.	.	.	.
18.05	1.2316	0.31	Q	.	.	.	.	.
18.31	1.2377	0.26	Q	.	.	.	.	.
18.57	1.2431	0.25	Q	.	.	.	.	.
18.83	1.2482	0.23	Q	.	.	.	.	.
19.08	1.2530	0.22	Q	.	.	.	.	.
19.34	1.2576	0.21	Q	.	.	.	.	.
19.60	1.2620	0.20	Q	.	.	.	.	.
19.85	1.2662	0.19	Q	.	.	.	.	.
20.11	1.2702	0.19	Q	.	.	.	.	.
20.37	1.2741	0.18	Q	.	.	.	.	.
20.62	1.2778	0.17	Q	.	.	.	.	.
20.88	1.2815	0.17	Q	.	.	.	.	.
21.14	1.2850	0.16	Q	.	.	.	.	.
21.39	1.2884	0.16	Q	.	.	.	.	.
21.65	1.2917	0.15	Q	.	.	.	.	.
21.91	1.2950	0.15	Q	.	.	.	.	.
22.16	1.2982	0.15	Q	.	.	.	.	.
22.42	1.3012	0.14	Q	.	.	.	.	.
22.68	1.3043	0.14	Q	.	.	.	.	.
22.93	1.3072	0.14	Q	.	.	.	.	.

23.19	1.3101	0.13	Q	.	.	.	.
23.45	1.3129	0.13	Q	.	.	.	.
23.70	1.3157	0.13	Q	.	.	.	.
23.96	1.3184	0.13	Q	.	.	.	.
24.22	1.3211	0.12	Q	.	.	.	.
24.48	1.3224	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%	1448.5
10%	46.2
20%	30.8
30%	15.4
40%	15.4
50%	15.4
60%	15.4
70%	15.4
80%	15.4
90%	15.4

Appendix J

BMP Analysis

Appendix J.1

BMP Analysis
2-Year Storm

Pond Report

Pond No. 1 - DA A1 - Detention Basin #1

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
5.50	105.50	n/a	184,599	184,599
6.00	106.00	n/a	20,208	204,807
6.50	106.50	n/a	20,285	225,092
7.00	107.00	n/a	20,284	245,376
7.50	107.50	n/a	20,208	265,584
8.00	108.00	n/a	20,056	285,640
8.50	108.50	n/a	19,822	305,462
9.00	109.00	n/a	19,501	324,963
9.50	109.50	n/a	19,087	344,050
10.00	110.00	n/a	18,563	362,613
10.50	110.50	n/a	17,911	380,524
11.00	111.00	n/a	17,099	397,623
11.50	111.50	n/a	16,064	413,687
12.00	112.00	n/a	14,675	428,362
12.50	112.50	n/a	12,368	440,730
13.00	113.00	n/a	9,453	450,183

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	24.00	0.00	0.00
Span (in)	= 12.00	24.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 105.50	107.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

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

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
5.50	184,599	105.50	0.00	0.00	---	---	---	---	---	---	---	---	0.000
6.00	204,807	106.00	0.95 ic	0.00	---	---	---	---	---	---	---	---	0.947
6.50	225,092	106.50	2.67 ic	0.00	---	---	---	---	---	---	---	---	2.674
7.00	245,376	107.00	3.78 ic	0.00	---	---	---	---	---	---	---	---	3.781
7.50	265,584	107.50	4.63 ic	1.48 ic	---	---	---	---	---	---	---	---	6.112
8.00	285,640	108.00	5.35 ic	5.36 ic	---	---	---	---	---	---	---	---	10.71
8.50	305,462	108.50	5.98 ic	10.55 ic	---	---	---	---	---	---	---	---	16.52
9.00	324,963	109.00	6.55 ic	15.12 ic	---	---	---	---	---	---	---	---	21.67
9.50	344,050	109.50	7.07 ic	18.52 ic	---	---	---	---	---	---	---	---	25.60
10.00	362,613	110.00	7.56 ic	21.39 ic	---	---	---	---	---	---	---	---	28.95
10.50	380,524	110.50	8.02 ic	23.91 ic	---	---	---	---	---	---	---	---	31.94
11.00	397,623	111.00	8.46 ic	26.20 ic	---	---	---	---	---	---	---	---	34.65
11.50	413,687	111.50	8.87 ic	28.30 ic	---	---	---	---	---	---	---	---	37.16
12.00	428,362	112.00	9.26 ic	30.25 ic	---	---	---	---	---	---	---	---	39.51
12.50	440,730	112.50	9.64 ic	32.08 ic	---	---	---	---	---	---	---	---	41.72
13.00	450,183	113.00	10.00 ic	33.82 ic	---	---	---	---	---	---	---	---	43.82

CONTECH ENGINEERED SOLUTIONS

Date: 12/23/2022
Project Name: Underground Detention CMP #1

City / County:
State:

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	600.0	Backfill Porosity (%):	40%	System Diameter (in):	144
Out-to-out width (ft):	72.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	5.0	Width At Ends (ft):	3.0	System Invert (Elevation):	0
		Width At Sides (ft):	3.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	18,907.2
0.17	0.16	0.0	0.0	3,151.2	3,151.2	3,151.2	3,151.2	0.0%	18,907.2
0.33	0.33	0.0	0.0	3,151.2	6,302.4	3,151.2	6,302.4	0.0%	18,907.2
0.50	0.50	0.0	0.0	3,151.2	9,453.6	3,151.2	9,453.6	0.0%	18,907.2
0.67	0.66	942.6	942.6	2,774.1	12,227.7	3,716.8	13,170.4	7.2%	23,983.1
0.83	0.83	1,712.3	2,654.9	2,466.3	14,694.0	4,178.6	17,348.9	15.3%	26,034.9
1.00	1.00	2,201.7	4,856.6	2,270.5	16,964.5	4,472.2	21,821.2	22.3%	27,574.2
1.17	1.16	2,588.5	7,445.2	2,115.8	19,080.3	4,704.3	26,525.5	28.1%	28,842.2
1.33	1.33	2,914.6	10,359.8	1,985.3	21,065.7	4,900.0	31,425.5	33.0%	29,932.9
1.50	1.50	3,198.9	13,558.7	1,871.6	22,937.3	5,070.5	36,496.0	37.2%	30,894.8
1.67	1.66	3,451.7	17,010.4	1,770.5	24,707.9	5,222.2	41,718.2	40.8%	31,756.8
1.83	1.83	3,679.5	20,689.9	1,679.4	26,387.2	5,358.9	47,077.1	43.9%	32,538.0
2.00	2.00	3,886.9	24,576.8	1,596.5	27,983.7	5,483.3	52,560.5	46.8%	33,251.4
2.17	2.16	4,076.8	28,653.5	1,520.5	29,504.2	5,597.3	58,157.7	49.3%	33,906.8
2.33	2.33	4,251.7	32,905.2	1,450.5	30,954.7	5,702.2	63,859.9	51.5%	34,511.6
2.50	2.50	4,413.3	37,318.5	1,385.9	32,340.6	5,799.2	69,659.1	53.6%	35,071.3
2.67	2.66	4,563.0	41,881.5	1,326.0	33,666.6	5,889.0	75,548.1	55.4%	35,590.5
2.83	2.83	4,702.1	46,583.6	1,270.4	34,937.0	5,972.4	81,520.5	57.1%	36,073.0
3.00	3.00	4,831.3	51,414.9	1,218.7	36,155.6	6,050.0	87,570.5	58.7%	36,521.6
3.17	3.16	4,951.6	56,366.5	1,170.6	37,326.2	6,122.1	93,692.7	60.2%	36,939.0
3.33	3.33	5,063.4	61,429.9	1,125.8	38,452.1	6,189.2	99,881.9	61.5%	37,327.2
3.50	3.50	5,167.4	66,597.3	1,084.2	39,536.3	6,251.7	106,133.6	62.7%	37,688.2
3.67	3.66	5,264.1	71,861.4	1,045.6	40,581.9	6,309.6	112,443.2	63.9%	38,023.3
3.83	3.83	5,353.7	77,215.1	1,009.7	41,591.6	6,363.4	118,806.7	65.0%	38,334.0
4.00	4.00	5,436.8	82,651.9	976.5	42,568.0	6,413.3	125,219.9	66.0%	38,621.4
4.17	4.16	5,513.5	88,165.4	945.8	43,513.8	6,459.3	131,679.2	67.0%	38,886.5
4.33	4.33	5,584.2	93,749.5	917.5	44,431.4	6,501.7	138,180.9	67.8%	39,130.3
4.50	4.50	5,649.0	99,398.5	891.6	45,323.0	6,540.6	144,721.5	68.7%	39,353.3
4.67	4.66	5,708.1	105,106.6	867.9	46,190.9	6,576.1	151,297.6	69.5%	39,556.4
4.83	4.83	5,761.9	110,868.5	846.5	47,037.4	6,608.3	157,905.9	70.2%	39,740.1
5.00	5.00	5,810.3	116,678.8	827.1	47,864.5	6,637.4	164,543.3	70.9%	39,905.0
5.17	5.16	5,853.5	122,532.2	809.8	48,674.3	6,663.3	171,206.5	71.6%	40,051.4
5.33	5.33	5,891.6	128,423.8	794.6	49,468.9	6,686.2	177,892.7	72.2%	40,179.7

5.50	5.50	5,924.8	134,348.6	781.3	50,250.2	6,706.1	184,598.8	72.8%	40,290.3
5.67	5.66	5,953.1	140,301.7	770.0	51,020.1	6,723.0	191,321.8	73.3%	40,383.4
5.83	5.83	5,976.6	146,278.3	760.6	51,780.7	6,737.1	198,059.0	73.9%	40,459.3
6.00	6.00	5,995.3	152,273.5	753.1	52,533.8	6,748.4	204,807.3	74.3%	40,518.2
6.17	6.16	6,009.3	158,282.8	747.5	53,281.3	6,756.8	211,564.1	74.8%	40,560.1
6.33	6.33	6,018.6	164,301.4	743.8	54,025.1	6,762.3	218,326.4	75.3%	40,585.2
6.50	6.50	6,023.2	170,324.6	741.9	54,767.0	6,765.1	225,091.6	75.7%	40,593.6
6.67	6.66	6,023.2	176,347.8	741.9	55,508.9	6,765.1	231,856.7	76.1%	40,585.2
6.83	6.83	6,018.6	182,366.4	743.8	56,252.6	6,762.3	238,619.0	76.4%	40,560.1
7.00	7.00	6,009.3	188,375.6	747.5	57,000.1	6,756.8	245,375.8	76.8%	40,518.2
7.17	7.16	5,995.3	194,370.9	753.1	57,753.2	6,748.4	252,124.1	77.1%	40,459.3
7.33	7.33	5,976.6	200,347.5	760.6	58,513.8	6,737.1	258,861.3	77.4%	40,383.4
7.50	7.50	5,953.1	206,300.5	770.0	59,283.8	6,723.0	265,584.3	77.7%	40,290.3
7.67	7.66	5,924.8	212,225.3	781.3	60,065.1	6,706.1	272,290.4	77.9%	40,179.7
7.83	7.83	5,891.6	218,117.0	794.6	60,859.6	6,686.2	278,976.6	78.2%	40,051.4
8.00	8.00	5,853.5	223,970.4	809.8	61,669.4	6,663.3	285,639.9	78.4%	39,905.0
8.17	8.16	5,810.3	229,780.7	827.1	62,496.5	6,637.4	292,277.2	78.6%	39,740.1
8.33	8.33	5,761.9	235,542.5	846.5	63,343.0	6,608.3	298,885.5	78.8%	39,556.4
8.50	8.50	5,708.1	241,250.7	867.9	64,210.9	6,576.1	305,461.6	79.0%	39,353.3
8.67	8.66	5,649.0	246,899.6	891.6	65,102.5	6,540.6	312,002.2	79.1%	39,130.3
8.83	8.83	5,584.2	252,483.8	917.5	66,020.1	6,501.7	318,503.9	79.3%	38,886.5
9.00	9.00	5,513.5	257,997.3	945.8	66,965.9	6,459.3	324,963.2	79.4%	38,621.4
9.17	9.16	5,436.8	263,434.1	976.5	67,942.4	6,413.3	331,376.4	79.5%	38,334.0
9.33	9.33	5,353.7	268,787.8	1,009.7	68,952.1	6,363.4	337,739.9	79.6%	38,023.3
9.50	9.50	5,264.1	274,051.9	1,045.6	69,997.6	6,309.6	344,049.5	79.7%	37,688.2
9.67	9.66	5,167.4	279,219.3	1,084.2	71,081.9	6,251.7	350,301.2	79.7%	37,327.2
9.83	9.83	5,063.4	284,282.7	1,125.8	72,207.7	6,189.2	356,490.4	79.7%	36,939.0
10.00	10.00	4,951.6	289,234.3	1,170.6	73,378.3	6,122.1	362,612.6	79.8%	36,521.6
10.17	10.16	4,831.3	294,065.6	1,218.7	74,597.0	6,050.0	368,662.6	79.8%	36,073.0
10.33	10.33	4,702.1	298,767.7	1,270.4	75,867.3	5,972.4	374,635.0	79.7%	35,590.5
10.50	10.50	4,563.0	303,330.7	1,326.0	77,193.3	5,889.0	380,524.0	79.7%	35,071.3
10.67	10.66	4,413.3	307,744.0	1,385.9	78,579.2	5,799.2	386,323.2	79.7%	34,511.6
10.83	10.83	4,251.7	311,995.6	1,450.5	80,029.7	5,702.2	392,025.4	79.6%	33,906.8
11.00	11.00	4,076.8	316,072.4	1,520.5	81,550.2	5,597.3	397,622.7	79.5%	33,251.4
11.17	11.16	3,886.9	319,959.3	1,596.5	83,146.7	5,483.3	403,106.0	79.4%	32,538.0
11.33	11.33	3,679.5	323,638.8	1,679.4	84,826.1	5,358.9	408,464.9	79.2%	31,756.8
11.50	11.50	3,451.7	327,090.5	1,770.5	86,596.6	5,222.2	413,687.1	79.1%	30,894.8
11.67	11.66	3,198.9	330,289.4	1,871.6	88,468.2	5,070.5	418,757.6	78.9%	29,932.9
11.83	11.83	2,914.6	333,204.0	1,985.3	90,453.6	4,900.0	423,657.6	78.6%	28,842.2
12.00	12.00	2,588.5	335,792.5	2,115.8	92,569.4	4,704.3	428,361.9	78.4%	27,574.2
12.17	12.16	2,201.7	337,994.3	2,270.5	94,839.9	4,472.2	432,834.2	78.1%	26,034.9
12.33	12.33	1,712.3	339,706.5	2,466.3	97,306.2	4,178.6	437,012.7	77.7%	23,983.1
12.50	12.50	942.6	340,649.2	2,774.1	100,080.3	3,716.8	440,729.5	77.3%	18,907.2
12.67	12.66	0.0	340,649.2	3,151.2	103,231.5	3,151.2	443,880.7	76.7%	18,907.2
12.83	12.83	0.0	340,649.2	3,151.2	106,382.7	3,151.2	447,031.9	76.2%	18,907.2
13.00	13.00	0.0	340,649.2	3,151.2	109,533.9	3,151.2	450,183.1	75.7%	18,907.2

Hydrograph Report

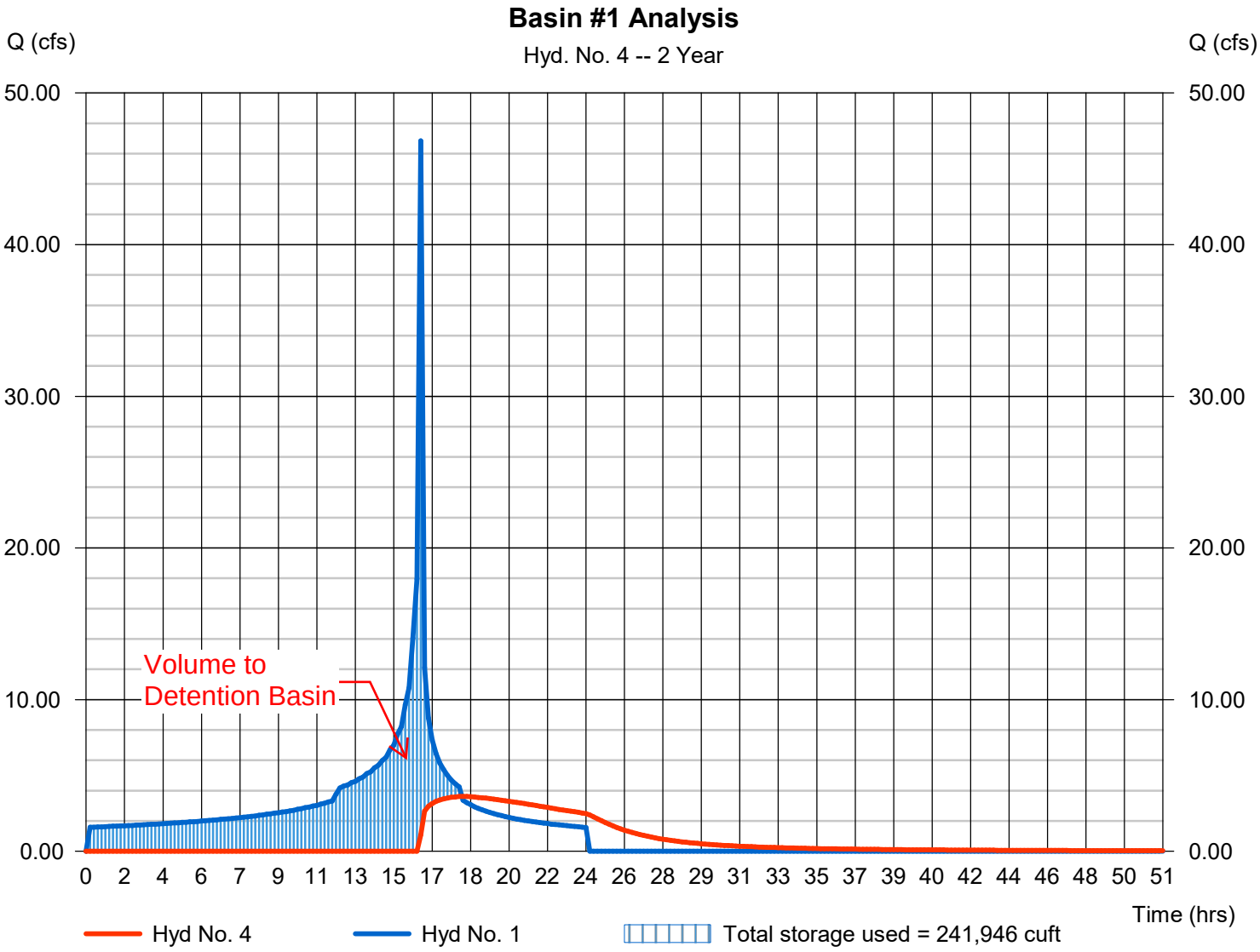
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Friday, 12 / 23 / 2022

Hyd. No. 4

Basin #1 Analysis

Hydrograph type	=	Reservoir	Peak discharge	=	3.618 cfs
Storm frequency	=	2 yrs	Time to peak	=	17.97 hrs
Time interval	=	11 min	Hyd. volume	=	127,230 cuft
Inflow hyd. No.	=	1 - Post A1	Max. Elevation	=	106.92 ft
Reservoir name	=	DA A1 - Detention Basin #1	Max. Storage	=	241,946 cuft

Storage Indication method used.



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**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
         (C) Copyright 1989-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                    Kimley-Horn and Associates, Inc.
                           765 The City Drive
                               Suite 200
                            Orange, CA 92868

**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  BASIN ANALYSIS
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A1
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   55.00
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.201
    LOW LOSS FRACTION = 0.287
    TIME OF CONCENTRATION(MIN.) = 11.08
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.21
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     3.97

**************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.12      0.0000      0.00  Q         .         .         .         .
  0.30      0.0121      1.58  .Q        .         .         .         .
```

0.49	0.0362	1.59	.Q	.	.	.	.
0.67	0.0606	1.60	.Q	.	.	.	.
0.86	0.0851	1.61	.Q	.	.	.	.
1.04	0.1097	1.62	.Q	.	.	.	.
1.23	0.1346	1.63	.Q	.	.	.	.
1.41	0.1596	1.65	.Q	.	.	.	.
1.60	0.1848	1.65	.Q	.	.	.	.
1.78	0.2102	1.67	.Q	.	.	.	.
1.97	0.2357	1.68	.Q	.	.	.	.
2.15	0.2614	1.69	.Q	.	.	.	.
2.33	0.2874	1.70	.Q	.	.	.	.
2.52	0.3135	1.72	.Q	.	.	.	.
2.70	0.3398	1.73	.Q	.	.	.	.
2.89	0.3664	1.75	.Q	.	.	.	.
3.07	0.3931	1.76	.Q	.	.	.	.
3.26	0.4201	1.78	.Q	.	.	.	.
3.44	0.4472	1.79	.Q	.	.	.	.
3.63	0.4746	1.80	.Q	.	.	.	.
3.81	0.5023	1.81	.Q	.	.	.	.
4.00	0.5301	1.84	.Q	.	.	.	.
4.18	0.5582	1.85	.Q	.	.	.	.
4.37	0.5865	1.87	.Q	.	.	.	.
4.55	0.6151	1.88	.Q	.	.	.	.
4.74	0.6440	1.90	.Q	.	.	.	.
4.92	0.6731	1.91	.Q	.	.	.	.
5.10	0.7025	1.94	.Q	.	.	.	.
5.29	0.7321	1.95	.Q	.	.	.	.
5.47	0.7621	1.97	.Q	.	.	.	.
5.66	0.7923	1.99	.Q	.	.	.	.
5.84	0.8228	2.01	.Q	.	.	.	.
6.03	0.8537	2.03	.Q	.	.	.	.
6.21	0.8849	2.06	.Q	.	.	.	.
6.40	0.9163	2.07	.Q	.	.	.	.
6.58	0.9482	2.10	.Q	.	.	.	.
6.77	0.9804	2.12	.Q	.	.	.	.
6.95	1.0129	2.15	.Q	.	.	.	.
7.14	1.0458	2.16	.Q	.	.	.	.
7.32	1.0791	2.20	.Q	.	.	.	.
7.51	1.1127	2.22	.Q	.	.	.	.
7.69	1.1468	2.25	.Q	.	.	.	.
7.87	1.1813	2.27	.Q	.	.	.	.
8.06	1.2163	2.31	.Q	.	.	.	.
8.24	1.2517	2.33	.Q	.	.	.	.
8.43	1.2875	2.37	.Q	.	.	.	.
8.61	1.3239	2.39	.Q	.	.	.	.
8.80	1.3607	2.44	.Q	.	.	.	.
8.98	1.3981	2.46	.Q	.	.	.	.
9.17	1.4360	2.51	. Q	.	.	.	.
9.35	1.4745	2.53	. Q	.	.	.	.
9.54	1.5136	2.59	. Q	.	.	.	.

9.72	1.5533	2.61	. Q	.	.	.	.	
9.91	1.5936	2.67	. Q	.	.	.	.	
10.09	1.6346	2.70	. Q	.	.	.	.	
10.28	1.6764	2.77	. Q	.	.	.	.	
10.46	1.7188	2.80	. Q	.	.	.	.	
10.64	1.7621	2.87	. Q	.	.	.	.	
10.83	1.8062	2.91	. Q	.	.	.	.	
11.01	1.8511	2.98	. Q	.	.	.	.	
11.20	1.8970	3.03	. Q	.	.	.	.	
11.38	1.9438	3.11	. Q	.	.	.	.	
11.57	1.9917	3.16	. Q	.	.	.	.	
11.75	2.0407	3.26	. Q	.	.	.	.	
11.94	2.0908	3.31	. Q	.	.	.	.	
12.12	2.1448	3.76	. Q	.	.	.	.	
12.31	2.2053	4.17	. Q	.	.	.	.	
12.49	2.2700	4.30	. Q	.	.	.	.	
12.68	2.3362	4.37	. Q	.	.	.	.	
12.86	2.4041	4.53	. Q	.	.	.	.	
13.05	2.4739	4.61	. Q	.	.	.	.	
13.23	2.5457	4.79	. Q	.	.	.	.	
13.41	2.6196	4.89	. Q	.	.	.	.	
13.60	2.6960	5.12	. Q	.	.	.	.	
13.78	2.7750	5.24	. Q	.	.	.	.	
13.97	2.8570	5.51	. Q	.	.	.	.	
14.15	2.9423	5.66	. Q	.	.	.	.	
14.34	3.0312	5.99	. Q	.	.	.	.	
14.52	3.1242	6.20	. Q	.	.	.	.	
14.71	3.2225	6.69	. Q	.	.	.	.	
14.89	3.3268	6.99	. Q	.	.	.	.	
15.08	3.4392	7.73	. Q	.	.	.	.	
15.26	3.5608	8.21	. Q	.	.	.	.	
15.45	3.6971	9.65	. Q	.	.	.	.	
15.63	3.8530	10.78	. Q	.	.	.	.	
15.82	4.0425	14.06	. Q	.	.	.	.	
16.00	4.2868	17.96	. Q	.	.	.	.	
16.18	4.7812	46.84	. Q	.	.	.	Q	.
16.37	5.2310	12.12	. Q	.	.	.	.	
16.55	5.3906	8.79	. Q	.	.	.	.	
16.74	5.5137	7.33	. Q	.	.	.	.	
16.92	5.6187	6.43	. Q	.	.	.	.	
17.11	5.7120	5.80	. Q	.	.	.	.	
17.29	5.7972	5.37	. Q	.	.	.	.	
17.48	5.8763	5.00	. Q	.	.	.	.	
17.66	5.9504	4.70	. Q	.	.	.	.	
17.85	6.0202	4.45	. Q	.	.	.	.	
18.03	6.0865	4.24	. Q	.	.	.	.	
18.22	6.1445	3.37	. Q	.	.	.	.	
18.40	6.1946	3.21	. Q	.	.	.	.	
18.59	6.2425	3.07	. Q	.	.	.	.	
18.77	6.2884	2.94	. Q	.	.	.	.	

18.95	6.3325	2.83	. Q	.	.	.	.
19.14	6.3750	2.73	. Q	.	.	.	.
19.32	6.4160	2.64	. Q	.	.	.	.
19.51	6.4557	2.56	. Q	.	.	.	.
19.69	6.4942	2.48	.Q	.	.	.	.
19.88	6.5316	2.41	.Q	.	.	.	.
20.06	6.5680	2.35	.Q	.	.	.	.
20.25	6.6034	2.29	.Q	.	.	.	.
20.43	6.6379	2.23	.Q	.	.	.	.
20.62	6.6716	2.18	.Q	.	.	.	.
20.80	6.7045	2.13	.Q	.	.	.	.
20.99	6.7366	2.09	.Q	.	.	.	.
21.17	6.7681	2.04	.Q	.	.	.	.
21.36	6.7990	2.00	.Q	.	.	.	.
21.54	6.8292	1.96	.Q	.	.	.	.
21.72	6.8589	1.93	.Q	.	.	.	.
21.91	6.8880	1.89	.Q	.	.	.	.
22.09	6.9166	1.86	.Q	.	.	.	.
22.28	6.9447	1.83	.Q	.	.	.	.
22.46	6.9723	1.79	.Q	.	.	.	.
22.65	6.9995	1.77	.Q	.	.	.	.
22.83	7.0262	1.74	.Q	.	.	.	.
23.02	7.0526	1.71	.Q	.	.	.	.
23.20	7.0785	1.69	.Q	.	.	.	.
23.39	7.1041	1.66	.Q	.	.	.	.
23.57	7.1292	1.64	.Q	.	.	.	.
23.76	7.1541	1.62	.Q	.	.	.	.
23.94	7.1786	1.59	.Q	.	.	.	.
24.13	7.2028	1.57	.Q	.	.	.	.
24.31	7.2148	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)

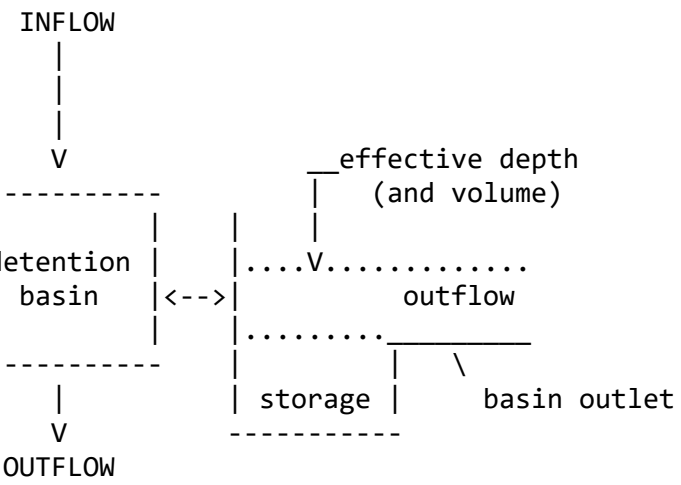
Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1440.4
10%	277.0
20%	66.5
30%	33.2
40%	11.1
50%	11.1
60%	11.1
70%	11.1
80%	11.1
90%	11.1

Problem Descriptions:
PACIFIC COMMERCE CENTER
BASIN ANALYSIS
POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A1

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 11.080
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 17

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS) **	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS) *
0.000	0.000	0.000**	5.500	4.238	0.000*
6.000	4.702	0.947**	6.500	5.167	2.674*
7.000	5.633	3.781**	7.500	6.097	6.112*
8.000	6.557	10.710**	8.500	7.012	16.520*
9.000	7.460	21.670**	9.500	7.898	25.600*
10.000	8.324	28.950**	10.500	8.736	31.940*
11.000	9.128	34.650**	11.500	9.497	37.160*
12.000	9.834	39.510**	12.500	10.118	41.720*
13.000	10.335	43.820**			

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)

1	0.00	0.00000	0.00000
2	5.50	4.23780	4.23780
3	6.00	4.69447	4.70893
4	6.50	5.14700	5.18780
5	7.00	5.60425	5.66195
6	7.50	6.05036	6.14364
7	8.00	6.47567	6.63913
8	8.50	6.88634	7.13846
9	9.00	7.29474	7.62546
10	9.50	7.70295	8.09365
11	10.00	8.10349	8.54531
12	10.50	8.49187	8.97933
13	11.00	8.86379	9.39261
14	11.50	9.21334	9.78046
15	12.00	9.53231	10.13529
16	12.50	9.79944	10.43616
17	13.00	10.00042	10.66918

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.119	0.000	0.00	0.00	0.00	0.000
0.303	0.000	1.58	0.03	0.00	0.024
0.488	0.000	1.59	0.06	0.00	0.048
0.673	0.000	1.60	0.09	0.00	0.073
0.857	0.000	1.61	0.13	0.00	0.097
1.042	0.000	1.62	0.16	0.00	0.122
1.227	0.000	1.63	0.19	0.00	0.147
1.411	0.000	1.65	0.22	0.00	0.172
1.596	0.000	1.65	0.26	0.00	0.197
1.781	0.000	1.67	0.29	0.00	0.223
1.965	0.000	1.68	0.32	0.00	0.249
2.150	0.000	1.69	0.36	0.00	0.274
2.335	0.000	1.70	0.39	0.00	0.300
2.519	0.000	1.72	0.42	0.00	0.327
2.704	0.000	1.73	0.46	0.00	0.353
2.889	0.000	1.75	0.49	0.00	0.380
3.073	0.000	1.76	0.53	0.00	0.407
3.258	0.000	1.78	0.56	0.00	0.434
3.443	0.000	1.79	0.60	0.00	0.461
3.627	0.000	1.80	0.63	0.00	0.488
3.812	0.000	1.81	0.67	0.00	0.516
3.997	0.000	1.84	0.71	0.00	0.544
4.181	0.000	1.85	0.74	0.00	0.572

4.366	0.000	1.87	0.78	0.00	0.601
4.551	0.000	1.88	0.82	0.00	0.629
4.735	0.000	1.90	0.85	0.00	0.658
4.920	0.000	1.91	0.89	0.00	0.688
5.105	0.000	1.94	0.93	0.00	0.717
5.289	0.000	1.95	0.97	0.00	0.747
5.474	0.000	1.97	1.01	0.00	0.777
5.659	0.000	1.99	1.05	0.00	0.807
5.843	0.000	2.01	1.09	0.00	0.838
6.028	0.000	2.03	1.13	0.00	0.869
6.213	0.000	2.06	1.17	0.00	0.901
6.397	0.000	2.07	1.21	0.00	0.932
6.582	0.000	2.10	1.25	0.00	0.964
6.767	0.000	2.12	1.29	0.00	0.996
6.951	0.000	2.15	1.34	0.00	1.029
7.136	0.000	2.16	1.38	0.00	1.062
7.321	0.000	2.20	1.42	0.00	1.096
7.505	0.000	2.22	1.47	0.00	1.130
7.690	0.000	2.25	1.51	0.00	1.164
7.875	0.000	2.27	1.56	0.00	1.199
8.059	0.000	2.31	1.60	0.00	1.234
8.244	0.000	2.33	1.65	0.00	1.269
8.429	0.000	2.37	1.69	0.00	1.306
8.613	0.000	2.39	1.74	0.00	1.342
8.798	0.000	2.44	1.79	0.00	1.379
8.983	0.000	2.46	1.84	0.00	1.417
9.167	0.000	2.51	1.89	0.00	1.455
9.352	0.000	2.53	1.94	0.00	1.494
9.537	0.000	2.59	1.99	0.00	1.533
9.721	0.000	2.61	2.04	0.00	1.573
9.906	0.000	2.67	2.09	0.00	1.614
10.091	0.000	2.70	2.15	0.00	1.655
10.275	0.000	2.77	2.20	0.00	1.697
10.460	0.000	2.80	2.26	0.00	1.740
10.645	0.000	2.87	2.32	0.00	1.784
10.829	0.000	2.91	2.37	0.00	1.828
11.014	0.000	2.98	2.43	0.00	1.874
11.199	0.000	3.03	2.49	0.00	1.920
11.383	0.000	3.11	2.55	0.00	1.968
11.568	0.000	3.16	2.62	0.00	2.016
11.753	0.000	3.26	2.68	0.00	2.066
11.937	0.000	3.31	2.75	0.00	2.116
12.122	0.000	3.76	2.82	0.00	2.173
12.307	0.000	4.17	2.90	0.00	2.237
12.491	0.000	4.30	2.99	0.00	2.303
12.676	0.000	4.37	3.08	0.00	2.370
12.861	0.000	4.53	3.17	0.00	2.439
13.045	0.000	4.61	3.26	0.00	2.509
13.230	0.000	4.79	3.35	0.00	2.582
13.415	0.000	4.89	3.45	0.00	2.657

13.599	0.000	5.12	3.55	0.00	2.735
13.784	0.000	5.24	3.65	0.00	2.815
13.969	0.000	5.51	3.76	0.00	2.899
14.153	0.000	5.66	3.87	0.00	2.986
14.338	0.000	5.99	3.99	0.00	3.077
14.523	0.000	6.20	4.12	0.00	3.171
14.707	0.000	6.69	4.25	0.00	3.274
14.892	0.000	6.99	4.39	0.00	3.380
15.077	0.000	7.73	4.54	0.00	3.498
15.261	0.000	8.21	4.70	0.00	3.623
15.446	0.000	9.65	4.89	0.00	3.771
15.631	0.000	10.78	5.11	0.00	3.935
15.815	0.000	14.06	5.39	0.00	4.150
16.000	0.000	17.96	5.70	0.19	4.421
16.185	0.000	46.84	6.44	1.42	5.114
16.369	0.000	12.12	6.60	2.68	5.258
16.554	0.000	8.79	6.69	2.99	5.346
16.739	0.000	7.33	6.76	3.18	5.410
16.923	0.000	6.43	6.81	3.31	5.458
17.108	0.000	5.80	6.85	3.41	5.494
17.293	0.000	5.37	6.88	3.48	5.523
17.477	0.000	5.00	6.91	3.55	5.545
17.662	0.000	4.70	6.92	3.59	5.562
17.847	0.000	4.45	6.94	3.63	5.575
18.031	0.000	4.24	6.95	3.65	5.583
18.216	0.000	3.37	6.94	3.66	5.579
18.401	0.000	3.21	6.93	3.64	5.572
18.585	0.000	3.07	6.93	3.63	5.564
18.770	0.000	2.94	6.91	3.60	5.554
18.955	0.000	2.83	6.90	3.58	5.542
19.139	0.000	2.73	6.89	3.55	5.530
19.324	0.000	2.64	6.87	3.52	5.517
19.509	0.000	2.56	6.86	3.49	5.502
19.693	0.000	2.48	6.84	3.45	5.488
19.878	0.000	2.41	6.83	3.42	5.472
20.063	0.000	2.35	6.81	3.38	5.457
20.247	0.000	2.29	6.79	3.34	5.441
20.432	0.000	2.23	6.78	3.30	5.424
20.617	0.000	2.18	6.76	3.26	5.408
20.801	0.000	2.13	6.74	3.23	5.391
20.986	0.000	2.09	6.72	3.19	5.374
21.171	0.000	2.04	6.70	3.15	5.357
21.355	0.000	2.00	6.69	3.11	5.340
21.540	0.000	1.96	6.67	3.07	5.324
21.725	0.000	1.93	6.65	3.03	5.307
21.909	0.000	1.89	6.63	2.99	5.290
22.094	0.000	1.86	6.61	2.95	5.273
22.279	0.000	1.83	6.60	2.91	5.257
22.463	0.000	1.79	6.58	2.87	5.241
22.648	0.000	1.77	6.56	2.83	5.224

22.833	0.000	1.74	6.54	2.79	5.208
23.017	0.000	1.71	6.53	2.75	5.192
23.202	0.000	1.69	6.51	2.71	5.177
23.387	0.000	1.66	6.49	2.67	5.161
23.571	0.000	1.64	6.48	2.62	5.146
23.756	0.000	1.62	6.46	2.57	5.132
23.941	0.000	1.59	6.45	2.52	5.118
24.125	0.000	1.57	6.43	2.46	5.104
24.310	0.000	0.00	6.39	2.37	5.068

Pond Report

Pond No. 2 - DA A2 - Detention Basin #2

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
5.00	105.00	n/a	50,434	50,434
5.50	105.50	n/a	6,127	56,561
6.00	106.00	n/a	6,172	62,733
6.50	106.50	n/a	6,196	68,929
7.00	107.00	n/a	6,195	75,124
7.50	107.50	n/a	6,173	81,297
8.00	108.00	n/a	6,126	87,423
8.50	108.50	n/a	6,057	93,480
9.00	109.00	n/a	5,960	99,440
9.50	109.50	n/a	5,835	105,275
10.00	110.00	n/a	5,677	110,952
10.50	110.50	n/a	5,482	116,434
11.00	111.00	n/a	5,237	121,671
11.50	111.50	n/a	4,926	126,597
12.00	112.00	n/a	4,509	131,106
12.50	112.50	n/a	3,814	134,920
13.00	113.00	n/a	2,937	137,857

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	12.00	0.00	0.00
Span (in)	= 6.00	12.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 105.00	106.50	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

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

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
5.00	50,434	105.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
5.50	56,561	105.50	0.47 ic	0.00	---	---	---	---	---	---	---	---	0.473
6.00	62,733	106.00	0.82 ic	0.00	---	---	---	---	---	---	---	---	0.819
6.50	68,929	106.50	1.06 ic	0.00	---	---	---	---	---	---	---	---	1.057
7.00	75,124	107.00	1.25 ic	0.95 ic	---	---	---	---	---	---	---	---	2.198
7.50	81,297	107.50	1.42 ic	2.67 ic	---	---	---	---	---	---	---	---	4.092
8.00	87,423	108.00	1.57 ic	3.78 ic	---	---	---	---	---	---	---	---	5.349
8.50	93,480	108.50	1.70 ic	4.63 ic	---	---	---	---	---	---	---	---	6.335
9.00	99,440	109.00	1.83 ic	5.35 ic	---	---	---	---	---	---	---	---	7.178
9.50	105,275	109.50	1.95 ic	5.98 ic	---	---	---	---	---	---	---	---	7.927
10.00	110,952	110.00	2.06 ic	6.55 ic	---	---	---	---	---	---	---	---	8.609
10.50	116,434	110.50	2.17 ic	7.07 ic	---	---	---	---	---	---	---	---	9.240
11.00	121,671	111.00	2.27 ic	7.56 ic	---	---	---	---	---	---	---	---	9.829
11.50	126,597	111.50	2.36 ic	8.02 ic	---	---	---	---	---	---	---	---	10.38
12.00	131,106	112.00	2.46 ic	8.46 ic	---	---	---	---	---	---	---	---	10.91
12.50	134,920	112.50	2.55 ic	8.87 ic	---	---	---	---	---	---	---	---	11.41
13.00	137,857	113.00	2.63 ic	9.26 ic	---	---	---	---	---	---	---	---	11.89

CONTECH ENGINEERED SOLUTIONS

Date: 12/23/2022
Project Name: Underground Detention CMP #2

City / County:
State:

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	300.0	Backfill Porosity (%):	40%	System Diameter (in):	144
Out-to-out width (ft):	42.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	3.0	Width At Ends (ft):	3.0	System Invert (Elevation):	0
		Width At Sides (ft):	3.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	5,875.2
0.17	0.16	0.0	0.0	979.2	979.2	979.2	979.2	0.0%	5,875.2
0.33	0.33	0.0	0.0	979.2	1,958.4	979.2	1,958.4	0.0%	5,875.2
0.50	0.50	0.0	0.0	979.2	2,937.6	979.2	2,937.6	0.0%	5,875.2
0.67	0.66	283.5	283.5	865.8	3,803.4	1,149.3	4,086.9	6.9%	7,402.0
0.83	0.83	515.0	798.6	773.2	4,576.6	1,288.2	5,375.2	14.9%	8,019.2
1.00	1.00	662.3	1,460.9	714.3	5,290.9	1,376.6	6,751.7	21.6%	8,482.2
1.17	1.16	778.6	2,239.5	667.8	5,958.6	1,446.4	8,198.1	27.3%	8,863.6
1.33	1.33	876.7	3,116.2	628.5	6,587.1	1,505.2	9,703.3	32.1%	9,191.7
1.50	1.50	962.2	4,078.4	594.3	7,181.4	1,556.5	11,259.8	36.2%	9,481.0
1.67	1.66	1,038.3	5,116.7	563.9	7,745.3	1,602.2	12,862.0	39.8%	9,740.3
1.83	1.83	1,106.8	6,223.5	536.5	8,281.8	1,643.3	14,505.3	42.9%	9,975.3
2.00	2.00	1,169.2	7,392.6	511.5	8,793.4	1,680.7	16,186.0	45.7%	10,189.9
2.17	2.16	1,226.3	8,618.9	488.7	9,282.0	1,715.0	17,900.9	48.1%	10,387.0
2.33	2.33	1,278.9	9,897.8	467.6	9,749.7	1,746.5	19,647.5	50.4%	10,568.9
2.50	2.50	1,327.5	11,225.3	448.2	10,197.9	1,775.7	21,423.2	52.4%	10,737.3
2.67	2.66	1,372.5	12,597.8	430.2	10,628.1	1,802.7	23,225.9	54.2%	10,893.5
2.83	2.83	1,414.4	14,012.2	413.5	11,041.5	1,827.8	25,053.7	55.9%	11,038.6
3.00	3.00	1,453.2	15,465.4	397.9	11,439.4	1,851.1	26,904.9	57.5%	11,173.6
3.17	3.16	1,489.4	16,954.9	383.4	11,822.9	1,872.8	28,777.7	58.9%	11,299.1
3.33	3.33	1,523.1	18,477.9	370.0	12,192.8	1,893.0	30,670.7	60.2%	11,415.9
3.50	3.50	1,554.3	20,032.3	357.5	12,550.3	1,911.8	32,582.6	61.5%	11,524.5
3.67	3.66	1,583.4	21,615.7	345.8	12,896.1	1,929.2	34,511.8	62.6%	11,625.3
3.83	3.83	1,610.4	23,226.1	335.0	13,231.2	1,945.4	36,457.2	63.7%	11,718.7
4.00	4.00	1,635.4	24,861.4	325.1	13,556.2	1,960.4	38,417.7	64.7%	11,805.2
4.17	4.16	1,658.4	26,519.9	315.8	13,872.1	1,974.3	40,391.9	65.7%	11,884.9
4.33	4.33	1,679.7	28,199.6	307.3	14,179.4	1,987.0	42,378.9	66.5%	11,958.2
4.50	4.50	1,699.2	29,898.8	299.5	14,478.9	1,998.7	44,377.7	67.4%	12,025.3
4.67	4.66	1,717.0	31,615.7	292.4	14,771.3	2,009.4	46,387.0	68.2%	12,086.4
4.83	4.83	1,733.1	33,348.9	285.9	15,057.2	2,019.1	48,406.1	68.9%	12,141.7
5.00	5.00	1,747.7	35,096.6	280.1	15,337.4	2,027.8	50,434.0	69.6%	12,191.3
5.17	5.16	1,760.7	36,857.3	274.9	15,612.3	2,035.6	52,469.6	70.2%	12,235.3
5.33	5.33	1,772.2	38,629.5	270.3	15,882.6	2,042.5	54,512.1	70.9%	12,273.9

5.50	5.50	1,782.2	40,411.6	266.3	16,148.9	2,048.5	56,560.6	71.4%	12,307.2
5.67	5.66	1,790.7	42,202.3	262.9	16,411.9	2,053.6	58,614.2	72.0%	12,335.2
5.83	5.83	1,797.7	44,000.0	260.1	16,672.0	2,057.8	60,672.0	72.5%	12,358.0
6.00	6.00	1,803.4	45,803.4	257.9	16,929.8	2,061.2	62,733.2	73.0%	12,375.7
6.17	6.16	1,807.6	47,611.0	256.2	17,186.0	2,063.7	64,797.0	73.5%	12,388.3
6.33	6.33	1,810.4	49,421.3	255.1	17,441.1	2,065.4	66,862.4	73.9%	12,395.9
6.50	6.50	1,811.8	51,233.1	254.5	17,695.6	2,066.3	68,928.7	74.3%	12,398.4
6.67	6.66	1,811.8	53,044.9	254.5	17,950.1	2,066.3	70,994.9	74.7%	12,395.9
6.83	6.83	1,810.4	54,855.2	255.1	18,205.1	2,065.4	73,060.3	75.1%	12,388.3
7.00	7.00	1,807.6	56,662.8	256.2	18,461.3	2,063.7	75,124.1	75.4%	12,375.7
7.17	7.16	1,803.4	58,466.2	257.9	18,719.1	2,061.2	77,185.3	75.7%	12,358.0
7.33	7.33	1,797.7	60,263.9	260.1	18,979.2	2,057.8	79,243.1	76.0%	12,335.2
7.50	7.50	1,790.7	62,054.5	262.9	19,242.2	2,053.6	81,296.7	76.3%	12,307.2
7.67	7.66	1,782.2	63,836.7	266.3	19,508.5	2,048.5	83,345.2	76.6%	12,273.9
7.83	7.83	1,772.2	65,608.9	270.3	19,778.8	2,042.5	85,387.7	76.8%	12,235.3
8.00	8.00	1,760.7	67,369.6	274.9	20,053.8	2,035.6	87,423.4	77.1%	12,191.3
8.17	8.16	1,747.7	69,117.3	280.1	20,333.9	2,027.8	89,451.2	77.3%	12,141.7
8.33	8.33	1,733.1	70,850.4	285.9	20,619.8	2,019.1	91,470.3	77.5%	12,086.4
8.50	8.50	1,717.0	72,567.4	292.4	20,912.2	2,009.4	93,479.7	77.6%	12,025.3
8.67	8.66	1,699.2	74,266.6	299.5	21,211.7	1,998.7	95,478.4	77.8%	11,958.2
8.83	8.83	1,679.7	75,946.3	307.3	21,519.1	1,987.0	97,465.4	77.9%	11,884.9
9.00	9.00	1,658.4	77,604.8	315.8	21,834.9	1,974.3	99,439.7	78.0%	11,805.2
9.17	9.16	1,635.4	79,240.1	325.1	22,159.9	1,960.4	101,400.1	78.1%	11,718.7
9.33	9.33	1,610.4	80,850.5	335.0	22,495.0	1,945.4	103,345.5	78.2%	11,625.3
9.50	9.50	1,583.4	82,433.9	345.8	22,840.8	1,929.2	105,274.8	78.3%	11,524.5
9.67	9.66	1,554.3	83,988.3	357.5	23,198.3	1,911.8	107,186.6	78.4%	11,415.9
9.83	9.83	1,523.1	85,511.3	370.0	23,568.3	1,893.0	109,079.6	78.4%	11,299.1
10.00	10.00	1,489.4	87,000.7	383.4	23,951.7	1,872.8	110,952.4	78.4%	11,173.6
10.17	10.16	1,453.2	88,454.0	397.9	24,349.6	1,851.1	112,803.6	78.4%	11,038.6
10.33	10.33	1,414.4	89,868.4	413.5	24,763.1	1,827.8	114,631.4	78.4%	10,893.5
10.50	10.50	1,372.5	91,240.9	430.2	25,193.2	1,802.7	116,434.1	78.4%	10,737.3
10.67	10.66	1,327.5	92,568.4	448.2	25,641.4	1,775.7	118,209.8	78.3%	10,568.9
10.83	10.83	1,278.9	93,847.3	467.6	26,109.1	1,746.5	119,956.4	78.2%	10,387.0
11.00	11.00	1,226.3	95,073.6	488.7	26,597.8	1,715.0	121,671.3	78.1%	10,189.9
11.17	11.16	1,169.2	96,242.7	511.5	27,109.3	1,680.7	123,352.0	78.0%	9,975.3
11.33	11.33	1,106.8	97,349.5	536.5	27,645.8	1,643.3	124,995.3	77.9%	9,740.3
11.50	11.50	1,038.3	98,387.8	563.9	28,209.7	1,602.2	126,597.5	77.7%	9,481.0
11.67	11.66	962.2	99,350.0	594.3	28,804.0	1,556.5	128,154.0	77.5%	9,191.7
11.83	11.83	876.7	100,226.7	628.5	29,432.5	1,505.2	129,659.2	77.3%	8,863.6
12.00	12.00	778.6	101,005.3	667.8	30,100.3	1,446.4	131,105.6	77.0%	8,482.2
12.17	12.16	662.3	101,667.6	714.3	30,814.6	1,376.6	132,482.2	76.7%	8,019.2
12.33	12.33	515.0	102,182.6	773.2	31,587.7	1,288.2	133,770.4	76.4%	7,402.0
12.50	12.50	283.5	102,466.2	865.8	32,453.5	1,149.3	134,919.7	75.9%	5,875.2
12.67	12.66	0.0	102,466.2	979.2	33,432.7	979.2	135,898.9	75.4%	5,875.2
12.83	12.83	0.0	102,466.2	979.2	34,411.9	979.2	136,878.1	74.9%	5,875.2
13.00	13.00	0.0	102,466.2	979.2	35,391.1	979.2	137,857.3	74.3%	5,875.2

Hydrograph Report

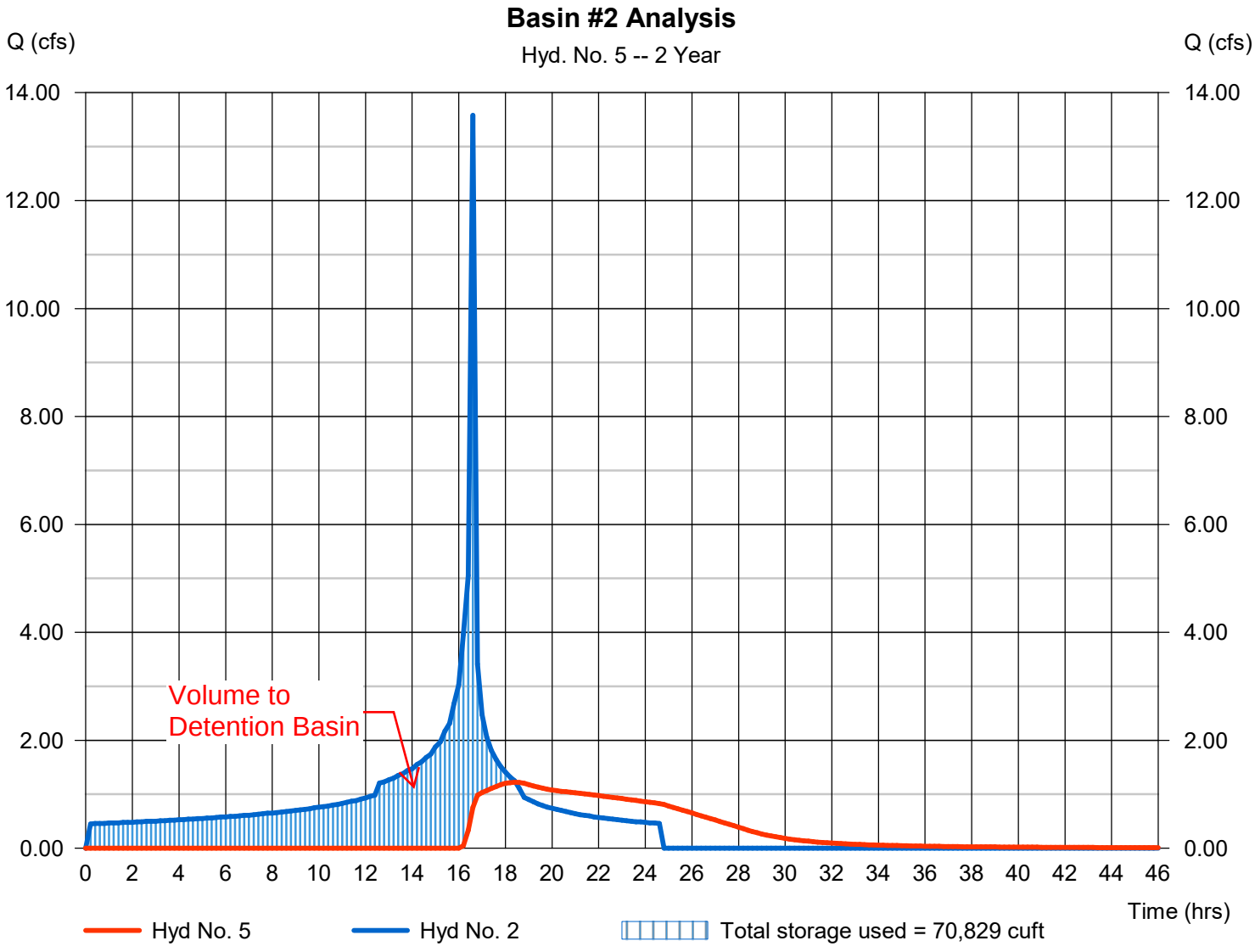
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Friday, 12 / 23 / 2022

Hyd. No. 5

Basin #2 Analysis

Hydrograph type	=	Reservoir	Peak discharge	=	1.223 cfs
Storm frequency	=	2 yrs	Time to peak	=	18.40 hrs
Time interval	=	12 min	Hyd. volume	=	42,763 cuft
Inflow hyd. No.	=	2 - Post A2	Max. Elevation	=	106.65 ft
Reservoir name	=	DA A2 - Detention Basin #2	Max. Storage	=	70,829 cuft

Storage Indication method used.



```
**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
         (C) Copyright 1989-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                    Kimley-Horn and Associates, Inc.
                           765 The City Drive
                               Suite 200
                            Orange, CA 92868

**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  BASIN ANALYSIS
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A2
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   18.95
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.319
    LOW LOSS FRACTION = 0.401
    TIME OF CONCENTRATION(MIN.) = 11.77
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     2.10
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.75

**************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.11      0.0021      0.45  Q         .         .         .         .
  0.31      0.0095      0.46  Q         .         .         .         .
```

0.50	0.0169	0.46	Q	.	.	.	.
0.70	0.0244	0.46	Q	.	.	.	.
0.90	0.0319	0.47	Q	.	.	.	.
1.09	0.0395	0.47	Q	.	.	.	.
1.29	0.0472	0.47	Q	.	.	.	.
1.48	0.0549	0.48	Q	.	.	.	.
1.68	0.0626	0.48	Q	.	.	.	.
1.88	0.0705	0.48	Q	.	.	.	.
2.07	0.0784	0.49	Q	.	.	.	.
2.27	0.0863	0.49	Q	.	.	.	.
2.46	0.0943	0.50	Q	.	.	.	.
2.66	0.1024	0.50	Q	.	.	.	.
2.86	0.1105	0.50	.Q	.	.	.	.
3.05	0.1187	0.51	.Q	.	.	.	.
3.25	0.1270	0.51	.Q	.	.	.	.
3.45	0.1354	0.52	.Q	.	.	.	.
3.64	0.1438	0.52	.Q	.	.	.	.
3.84	0.1523	0.53	.Q	.	.	.	.
4.03	0.1609	0.53	.Q	.	.	.	.
4.23	0.1695	0.54	.Q	.	.	.	.
4.43	0.1783	0.54	.Q	.	.	.	.
4.62	0.1871	0.55	.Q	.	.	.	.
4.82	0.1960	0.55	.Q	.	.	.	.
5.01	0.2050	0.56	.Q	.	.	.	.
5.21	0.2140	0.56	.Q	.	.	.	.
5.41	0.2232	0.57	.Q	.	.	.	.
5.60	0.2325	0.58	.Q	.	.	.	.
5.80	0.2418	0.58	.Q	.	.	.	.
6.00	0.2513	0.59	.Q	.	.	.	.
6.19	0.2608	0.59	.Q	.	.	.	.
6.39	0.2705	0.60	.Q	.	.	.	.
6.58	0.2803	0.61	.Q	.	.	.	.
6.78	0.2902	0.61	.Q	.	.	.	.
6.98	0.3002	0.62	.Q	.	.	.	.
7.17	0.3103	0.63	.Q	.	.	.	.
7.37	0.3206	0.64	.Q	.	.	.	.
7.56	0.3310	0.65	.Q	.	.	.	.
7.76	0.3415	0.65	.Q	.	.	.	.
7.96	0.3521	0.66	.Q	.	.	.	.
8.15	0.3629	0.67	.Q	.	.	.	.
8.35	0.3739	0.68	.Q	.	.	.	.
8.55	0.3850	0.69	.Q	.	.	.	.
8.74	0.3963	0.70	.Q	.	.	.	.
8.94	0.4077	0.71	.Q	.	.	.	.
9.13	0.4193	0.72	.Q	.	.	.	.
9.33	0.4311	0.73	.Q	.	.	.	.
9.53	0.4431	0.75	.Q	.	.	.	.
9.72	0.4553	0.76	.Q	.	.	.	.
9.92	0.4677	0.77	.Q	.	.	.	.
10.11	0.4803	0.78	.Q	.	.	.	.

10.31	0.4932	0.80	.Q	.	.	.	.
10.51	0.5063	0.81	.Q	.	.	.	.
10.70	0.5196	0.83	.Q	.	.	.	.
10.90	0.5333	0.85	.Q	.	.	.	.
11.10	0.5472	0.87	.Q	.	.	.	.
11.29	0.5614	0.88	.Q	.	.	.	.
11.49	0.5760	0.91	.Q	.	.	.	.
11.68	0.5909	0.93	.Q	.	.	.	.
11.88	0.6062	0.96	.Q	.	.	.	.
12.08	0.6218	0.98	.Q	.	.	.	.
12.27	0.6395	1.21	. Q	.	.	.	.
12.47	0.6593	1.23	. Q	.	.	.	.
12.67	0.6796	1.27	. Q	.	.	.	.
12.86	0.7005	1.30	. Q	.	.	.	.
13.06	0.7219	1.35	. Q	.	.	.	.
13.25	0.7440	1.38	. Q	.	.	.	.
13.45	0.7668	1.44	. Q	.	.	.	.
13.65	0.7904	1.47	. Q	.	.	.	.
13.84	0.8150	1.55	. Q	.	.	.	.
14.04	0.8405	1.60	. Q	.	.	.	.
14.23	0.8670	1.68	. Q	.	.	.	.
14.43	0.8948	1.74	. Q	.	.	.	.
14.63	0.9242	1.88	. Q	.	.	.	.
14.82	0.9553	1.97	. Q	.	.	.	.
15.02	0.9889	2.17	. Q	.	.	.	.
15.22	1.0252	2.31	. Q	.	.	.	.
15.41	1.0657	2.69	. Q	.	.	.	.
15.61	1.1121	3.03	. Q	.	.	.	.
15.80	1.1688	3.96	. Q	.	.	.	.
16.00	1.2419	5.05	. Q	.	.	.	.
16.20	1.3929	13.58	.	.	.	Q	.	.
16.39	1.5306	3.41	. Q	.	.	.	.
16.59	1.5783	2.47	. Q	.	.	.	.
16.78	1.6151	2.06	. Q	.	.	.	.
16.98	1.6464	1.81	. Q	.	.	.	.
17.18	1.6744	1.64	. Q	.	.	.	.
17.37	1.6999	1.51	. Q	.	.	.	.
17.57	1.7236	1.41	. Q	.	.	.	.
17.77	1.7457	1.32	. Q	.	.	.	.
17.96	1.7666	1.25	. Q	.	.	.	.
18.16	1.7857	1.11	. Q	.	.	.	.
18.35	1.8023	0.94	.Q	.	.	.	.
18.55	1.8172	0.90	.Q	.	.	.	.
18.75	1.8315	0.86	.Q	.	.	.	.
18.94	1.8451	0.82	.Q	.	.	.	.
19.14	1.8582	0.79	.Q	.	.	.	.
19.33	1.8708	0.76	.Q	.	.	.	.
19.53	1.8830	0.74	.Q	.	.	.	.
19.73	1.8948	0.72	.Q	.	.	.	.
19.92	1.9063	0.70	.Q	.	.	.	.

```
 20.12      1.9174      0.68  .Q        .         .         .         .
 20.32      1.9282      0.66  .Q        .         .         .         .
 20.51      1.9387      0.64  .Q        .         .         .         .
 20.71      1.9490      0.62  .Q        .         .         .         .
 20.90      1.9590      0.61  .Q        .         .         .         .
 21.10      1.9688      0.60  .Q        .         .         .         .
 21.30      1.9783      0.58  .Q        .         .         .         .
 21.49      1.9877      0.57  .Q        .         .         .         .
 21.69      1.9969      0.56  .Q        .         .         .         .
 21.89      2.0058      0.55  .Q        .         .         .         .
 22.08      2.0147      0.54  .Q        .         .         .         .
 22.28      2.0233      0.53  .Q        .         .         .         .
 22.47      2.0318      0.52  .Q        .         .         .         .
 22.67      2.0402      0.51  .Q        .         .         .         .
 22.87      2.0484      0.50  .Q        .         .         .         .
 23.06      2.0564      0.49  Q         .         .         .         .
 23.26      2.0644      0.49  Q         .         .         .         .
 23.45      2.0722      0.48  Q         .         .         .         .
 23.65      2.0799      0.47  Q         .         .         .         .
 23.85      2.0875      0.47  Q         .         .         .         .
 24.04      2.0950      0.46  Q         .         .         .         .
 24.24      2.0987      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              Duration
        Peak Flow Rate                   (minutes)
    ======================               =========
               0%                         1447.7
              10%                          270.7
              20%                           58.9
              30%                           23.5
              40%                           11.8
              50%                           11.8
              60%                           11.8
              70%                           11.8
              80%                           11.8
              90%                           11.8

  Problem Descriptions:
   PACIFIC COMMERCE CENTER
   BASIN ANALYSIS
   POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A2



============================================================================
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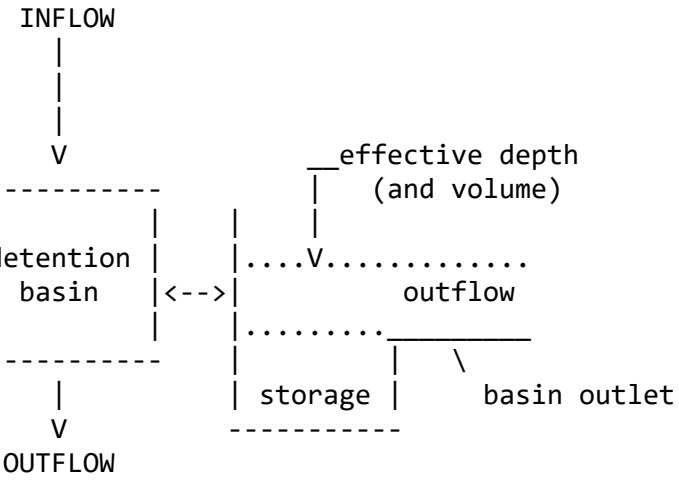
FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 11.770
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 18

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000	**	5.000	1.158	0.000	*
5.500	1.298	0.473	**	6.000	1.440	0.819	*
6.500	1.582	1.057	**	7.000	1.725	2.198	*
7.500	1.866	4.092	**	8.000	2.007	5.349	*
8.500	2.146	6.335	**	9.000	2.283	7.178	*
9.500	2.417	7.927	**	10.000	2.547	8.609	*
10.500	2.673	9.240	**	11.000	2.793	9.829	*
11.500	2.906	10.380	**	12.000	3.010	10.910	*
12.500	3.097	11.410	**	13.000	3.165	11.890	*

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	5.00	1.15780	1.15780
3	5.50	1.29467	1.30233
4	6.00	1.43356	1.44684
5	6.50	1.57383	1.59097
6	7.00	1.70678	1.74242
7	7.50	1.83313	1.89947
8	8.00	1.96364	2.05036

9	8.50	2.09465	2.19735
10	9.00	2.22461	2.34099
11	9.50	2.35254	2.48106
12	10.00	2.47731	2.61689
13	10.50	2.59810	2.74790
14	11.00	2.71353	2.87287
15	11.50	2.82216	2.99044
16	12.00	2.92136	3.09824
17	12.50	3.00481	3.18979
18	13.00	3.06842	3.26118

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.110	0.000	0.45	0.03	0.00	0.007
0.307	0.000	0.46	0.06	0.00	0.015
0.503	0.000	0.46	0.10	0.00	0.022
0.699	0.000	0.46	0.13	0.00	0.030
0.895	0.000	0.47	0.16	0.00	0.037
1.091	0.000	0.47	0.19	0.00	0.045
1.287	0.000	0.47	0.23	0.00	0.053
1.484	0.000	0.48	0.26	0.00	0.060
1.680	0.000	0.48	0.29	0.00	0.068
1.876	0.000	0.48	0.33	0.00	0.076
2.072	0.000	0.49	0.36	0.00	0.084
2.268	0.000	0.49	0.40	0.00	0.092
2.464	0.000	0.50	0.43	0.00	0.100
2.661	0.000	0.50	0.47	0.00	0.108
2.857	0.000	0.50	0.50	0.00	0.116
3.053	0.000	0.51	0.54	0.00	0.124
3.249	0.000	0.51	0.57	0.00	0.133
3.445	0.000	0.52	0.61	0.00	0.141
3.641	0.000	0.52	0.65	0.00	0.150
3.838	0.000	0.53	0.68	0.00	0.158
4.034	0.000	0.53	0.72	0.00	0.167
4.230	0.000	0.54	0.76	0.00	0.175
4.426	0.000	0.54	0.80	0.00	0.184
4.622	0.000	0.55	0.83	0.00	0.193
4.818	0.000	0.55	0.87	0.00	0.202
5.015	0.000	0.56	0.91	0.00	0.211
5.211	0.000	0.56	0.95	0.00	0.220
5.407	0.000	0.57	0.99	0.00	0.229
5.603	0.000	0.58	1.03	0.00	0.239
5.799	0.000	0.58	1.07	0.00	0.248

5.995	0.000	0.59	1.11	0.00	0.258
6.192	0.000	0.59	1.15	0.00	0.267
6.388	0.000	0.60	1.20	0.00	0.277
6.584	0.000	0.61	1.24	0.00	0.287
6.780	0.000	0.61	1.28	0.00	0.297
6.976	0.000	0.62	1.33	0.00	0.307
7.172	0.000	0.63	1.37	0.00	0.317
7.369	0.000	0.64	1.41	0.00	0.327
7.565	0.000	0.65	1.46	0.00	0.338
7.761	0.000	0.65	1.50	0.00	0.348
7.957	0.000	0.66	1.55	0.00	0.359
8.153	0.000	0.67	1.60	0.00	0.370
8.349	0.000	0.68	1.65	0.00	0.381
8.546	0.000	0.69	1.69	0.00	0.392
8.742	0.000	0.70	1.74	0.00	0.404
8.938	0.000	0.71	1.79	0.00	0.415
9.134	0.000	0.72	1.84	0.00	0.427
9.330	0.000	0.73	1.89	0.00	0.439
9.526	0.000	0.75	1.95	0.00	0.451
9.723	0.000	0.76	2.00	0.00	0.463
9.919	0.000	0.77	2.05	0.00	0.476
10.115	0.000	0.78	2.11	0.00	0.488
10.311	0.000	0.80	2.16	0.00	0.501
10.507	0.000	0.81	2.22	0.00	0.514
10.703	0.000	0.83	2.28	0.00	0.528
10.900	0.000	0.85	2.34	0.00	0.542
11.096	0.000	0.87	2.40	0.00	0.556
11.292	0.000	0.88	2.46	0.00	0.570
11.488	0.000	0.91	2.53	0.00	0.585
11.684	0.000	0.93	2.59	0.00	0.600
11.880	0.000	0.96	2.66	0.00	0.616
12.077	0.000	0.98	2.73	0.00	0.631
12.273	0.000	1.21	2.81	0.00	0.651
12.469	0.000	1.23	2.90	0.00	0.671
12.665	0.000	1.27	2.99	0.00	0.692
12.861	0.000	1.30	3.08	0.00	0.713
13.057	0.000	1.35	3.17	0.00	0.734
13.254	0.000	1.38	3.27	0.00	0.757
13.450	0.000	1.44	3.37	0.00	0.780
13.646	0.000	1.47	3.47	0.00	0.804
13.842	0.000	1.55	3.58	0.00	0.829
14.038	0.000	1.60	3.69	0.00	0.855
14.234	0.000	1.68	3.81	0.00	0.882
14.431	0.000	1.74	3.93	0.00	0.911
14.627	0.000	1.88	4.06	0.00	0.941
14.823	0.000	1.97	4.20	0.00	0.973
15.019	0.000	2.17	4.35	0.00	1.008
15.215	0.000	2.31	4.52	0.00	1.046
15.411	0.000	2.69	4.70	0.00	1.089
15.608	0.000	3.03	4.92	0.00	1.138

15.804	0.000	3.96	5.15	0.07	1.201
16.000	0.000	5.05	5.43	0.28	1.279
16.196	0.000	13.58	6.17	0.65	1.488
16.392	0.000	3.41	6.31	0.93	1.529
16.588	0.000	2.47	6.40	0.99	1.553
16.785	0.000	2.06	6.45	1.02	1.569
16.981	0.000	1.81	6.50	1.05	1.582
17.177	0.000	1.64	6.53	1.09	1.591
17.373	0.000	1.51	6.55	1.15	1.597
17.569	0.000	1.41	6.56	1.19	1.600
17.766	0.000	1.32	6.57	1.21	1.602
17.962	0.000	1.25	6.57	1.22	1.603
18.158	0.000	1.11	6.57	1.21	1.601
18.354	0.000	0.94	6.55	1.19	1.597
18.550	0.000	0.90	6.54	1.16	1.593
18.746	0.000	0.86	6.52	1.12	1.588
18.943	0.000	0.82	6.51	1.09	1.584
19.139	0.000	0.79	6.49	1.06	1.580
19.335	0.000	0.76	6.47	1.05	1.575
19.531	0.000	0.74	6.46	1.04	1.570
19.727	0.000	0.72	6.44	1.03	1.565
19.923	0.000	0.70	6.42	1.02	1.560
20.120	0.000	0.68	6.40	1.01	1.554
20.316	0.000	0.66	6.38	1.01	1.549
20.512	0.000	0.64	6.36	1.00	1.543
20.708	0.000	0.62	6.34	0.99	1.537
20.904	0.000	0.61	6.32	0.98	1.531
21.100	0.000	0.60	6.30	0.97	1.525
21.297	0.000	0.58	6.28	0.96	1.519
21.493	0.000	0.57	6.26	0.95	1.513
21.689	0.000	0.56	6.23	0.94	1.507
21.885	0.000	0.55	6.21	0.93	1.501
22.081	0.000	0.54	6.19	0.92	1.495
22.277	0.000	0.53	6.17	0.91	1.489
22.474	0.000	0.52	6.15	0.89	1.483
22.670	0.000	0.51	6.13	0.88	1.476
22.866	0.000	0.50	6.11	0.87	1.470
23.062	0.000	0.49	6.09	0.86	1.464
23.258	0.000	0.49	6.06	0.85	1.458
23.454	0.000	0.48	6.04	0.84	1.453
23.651	0.000	0.47	6.02	0.83	1.447
23.847	0.000	0.47	6.00	0.82	1.441
24.043	0.000	0.46	5.98	0.81	1.435
24.239	0.000	0.00	5.94	0.79	1.422

Pond Report

Pond No. 3 - DA A3 - Detention Basin #3

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
5.00	105.00	n/a	196,739	196,739
5.50	105.50	n/a	23,996	220,735
6.00	106.00	n/a	24,179	244,914
6.50	106.50	n/a	24,271	269,185
7.00	107.00	n/a	24,270	293,455
7.50	107.50	n/a	24,180	317,635
8.00	108.00	n/a	23,996	341,631
8.50	108.50	n/a	23,716	365,347
9.00	109.00	n/a	23,331	388,678
9.50	109.50	n/a	22,833	411,511
10.00	110.00	n/a	22,204	433,715
10.50	110.50	n/a	21,423	455,138
11.00	111.00	n/a	20,447	475,585
11.50	111.50	n/a	19,206	494,791
12.00	112.00	n/a	17,538	512,329
12.50	112.50	n/a	14,769	527,098
13.00	113.00	n/a	11,272	538,370

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	24.00	0.00	0.00
Span (in)	= 12.00	24.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 105.00	107.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

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

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
5.00	196,739	105.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
5.50	220,735	105.50	0.95 ic	0.00	---	---	---	---	---	---	---	---	0.947
6.00	244,914	106.00	2.67 ic	0.00	---	---	---	---	---	---	---	---	2.674
6.50	269,185	106.50	3.78 ic	0.00	---	---	---	---	---	---	---	---	3.781
7.00	293,455	107.00	4.63 ic	0.00	---	---	---	---	---	---	---	---	4.631
7.50	317,635	107.50	5.35 ic	1.48 ic	---	---	---	---	---	---	---	---	6.828
8.00	341,631	108.00	5.98 ic	5.36 ic	---	---	---	---	---	---	---	---	11.34
8.50	365,347	108.50	6.55 ic	10.55 ic	---	---	---	---	---	---	---	---	17.09
9.00	388,678	109.00	7.07 ic	15.12 ic	---	---	---	---	---	---	---	---	22.20
9.50	411,511	109.50	7.56 ic	18.52 ic	---	---	---	---	---	---	---	---	26.09
10.00	433,715	110.00	8.02 ic	21.39 ic	---	---	---	---	---	---	---	---	29.41
10.50	455,138	110.50	8.46 ic	23.91 ic	---	---	---	---	---	---	---	---	32.37
11.00	475,585	111.00	8.87 ic	26.20 ic	---	---	---	---	---	---	---	---	35.06
11.50	494,791	111.50	9.26 ic	28.30 ic	---	---	---	---	---	---	---	---	37.56
12.00	512,329	112.00	9.64 ic	30.25 ic	---	---	---	---	---	---	---	---	39.89
12.50	527,098	112.50	10.00 ic	32.08 ic	---	---	---	---	---	---	---	---	42.09
13.00	538,370	113.00	10.36 ic	33.82 ic	---	---	---	---	---	---	---	---	44.18

CONTECH ENGINEERED SOLUTIONS

Date: 12/23/2022
Project Name: Underground Detention CMP #3

City / County:
State:

Designed By:
Company:
Telephone:

CMP: Underground Detention System
Storage Volume Estimation

=Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are subject to verification of the Engineer of Record. **This tool is only applicable for rectangular shaped systems.**

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	600.0	Backfill Porosity (%):	40%	System Diameter (in):	144
Out-to-out width (ft):	87.0	Depth Above Pipe (in):	6.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	6.0	Incremental Analysis (in):	2
Number of Barrels (ea):	6.0	Width At Ends (ft):	3.0	System Invert (Elevation):	0
		Width At Sides (ft):	3.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	22,543.2
0.17	0.16	0.0	0.0	3,757.2	3,757.2	3,757.2	3,757.2	0.0%	22,543.2
0.33	0.33	0.0	0.0	3,757.2	7,514.4	3,757.2	7,514.4	0.0%	22,543.2
0.50	0.50	0.0	0.0	3,757.2	11,271.6	3,757.2	11,271.6	0.0%	22,543.2
0.67	0.66	1,131.3	1,131.3	3,304.7	14,576.3	4,436.0	15,707.6	7.2%	28,635.3
0.83	0.83	2,055.1	3,186.4	2,935.2	17,511.4	4,990.2	20,697.9	15.4%	31,097.9
1.00	1.00	2,642.5	5,828.9	2,700.2	20,211.6	5,342.7	26,040.6	22.4%	32,945.4
1.17	1.16	3,106.7	8,935.7	2,514.5	22,726.1	5,621.2	31,661.8	28.2%	34,467.2
1.33	1.33	3,498.2	12,433.8	2,357.9	25,084.1	5,856.1	37,517.9	33.1%	35,776.3
1.50	1.50	3,839.3	16,273.1	2,221.5	27,305.6	6,060.8	43,578.7	37.3%	36,930.7
1.67	1.66	4,142.7	20,415.8	2,100.1	29,405.7	6,242.8	49,821.5	41.0%	37,965.3
1.83	1.83	4,416.2	24,832.0	1,990.7	31,396.4	6,406.9	56,228.4	44.2%	38,902.8
2.00	2.00	4,665.0	29,497.0	1,891.2	33,287.6	6,556.2	62,784.6	47.0%	39,759.1
2.17	2.16	4,893.0	34,389.9	1,800.0	35,087.6	6,693.0	69,477.6	49.5%	40,545.8
2.33	2.33	5,102.8	39,492.8	1,716.1	36,803.7	6,818.9	76,296.5	51.8%	41,271.6
2.50	2.50	5,296.8	44,789.6	1,638.5	38,442.2	6,935.3	83,231.8	53.8%	41,943.3
2.67	2.66	5,476.5	50,266.1	1,566.6	40,008.7	7,043.1	90,274.9	55.7%	42,566.5
2.83	2.83	5,643.4	55,909.6	1,499.8	41,508.6	7,143.3	97,418.1	57.4%	43,145.5
3.00	3.00	5,798.6	61,708.1	1,437.8	42,946.4	7,236.3	104,654.5	59.0%	43,684.0
3.17	3.16	5,942.9	67,651.0	1,380.1	44,326.4	7,322.9	111,977.4	60.4%	44,184.9
3.33	3.33	6,077.1	73,728.1	1,326.4	45,652.8	7,403.5	119,380.8	61.8%	44,650.9
3.50	3.50	6,201.9	79,930.0	1,276.4	46,929.2	7,478.4	126,859.2	63.0%	45,084.1
3.67	3.66	6,317.9	86,247.9	1,230.0	48,159.2	7,548.0	134,407.2	64.2%	45,486.3
3.83	3.83	6,425.6	92,673.5	1,187.0	49,346.2	7,612.5	142,019.7	65.3%	45,859.2
4.00	4.00	6,525.2	99,198.7	1,147.1	50,493.3	7,672.3	149,692.0	66.3%	46,204.2
4.17	4.16	6,617.3	105,816.0	1,110.3	51,603.6	7,727.6	157,419.6	67.2%	46,522.4
4.33	4.33	6,702.1	112,518.1	1,076.4	52,680.0	7,778.5	165,198.1	68.1%	46,814.9
4.50	4.50	6,779.9	119,298.0	1,045.2	53,725.2	7,825.1	173,023.2	68.9%	47,082.6
4.67	4.66	6,850.9	126,148.9	1,016.8	54,742.0	7,867.7	180,890.9	69.7%	47,326.4
4.83	4.83	6,915.4	133,064.3	991.1	55,733.1	7,906.4	188,797.4	70.5%	47,546.9
5.00	5.00	6,973.5	140,037.7	967.8	56,700.9	7,941.3	196,738.6	71.2%	47,744.7
5.17	5.16	7,025.3	147,063.1	947.1	57,648.0	7,972.4	204,711.0	71.8%	47,920.4
5.33	5.33	7,071.1	154,134.2	928.8	58,576.7	7,999.9	212,710.9	72.5%	48,074.4

5.50	5.50	7,110.9	161,245.1	912.8	59,489.6	8,023.8	220,734.7	73.0%	48,207.2
5.67	5.66	7,144.9	168,390.0	899.2	60,388.8	8,044.1	228,778.8	73.6%	48,318.9
5.83	5.83	7,173.1	175,563.1	888.0	61,276.8	8,061.0	236,839.8	74.1%	48,410.0
6.00	6.00	7,195.5	182,758.6	879.0	62,155.8	8,074.5	244,914.3	74.6%	48,480.7
6.17	6.16	7,212.3	189,970.9	872.3	63,028.0	8,084.6	252,998.9	75.1%	48,531.0
6.33	6.33	7,223.5	197,194.4	867.8	63,895.9	8,091.3	261,090.2	75.5%	48,561.2
6.50	6.50	7,229.1	204,423.4	865.6	64,761.4	8,094.6	269,184.9	75.9%	48,571.2
6.67	6.66	7,229.1	211,652.5	865.6	65,627.0	8,094.6	277,279.5	76.3%	48,561.2
6.83	6.83	7,223.5	218,876.0	867.8	66,494.8	8,091.3	285,370.8	76.7%	48,531.0
7.00	7.00	7,212.3	226,088.3	872.3	67,367.1	8,084.6	293,455.4	77.0%	48,480.7
7.17	7.16	7,195.5	233,283.8	879.0	68,246.1	8,074.5	301,529.9	77.4%	48,410.0
7.33	7.33	7,173.1	240,456.9	888.0	69,134.1	8,061.0	309,590.9	77.7%	48,318.9
7.50	7.50	7,144.9	247,601.8	899.2	70,033.3	8,044.1	317,635.1	78.0%	48,207.2
7.67	7.66	7,110.9	254,712.7	912.8	70,946.1	8,023.8	325,658.8	78.2%	48,074.4
7.83	7.83	7,071.1	261,783.8	928.8	71,874.9	7,999.9	333,658.7	78.5%	47,920.4
8.00	8.00	7,025.3	268,809.1	947.1	72,822.0	7,972.4	341,631.1	78.7%	47,744.7
8.17	8.16	6,973.5	275,782.6	967.8	73,789.8	7,941.3	349,572.3	78.9%	47,546.9
8.33	8.33	6,915.4	282,698.0	991.1	74,780.8	7,906.4	357,478.8	79.1%	47,326.4
8.50	8.50	6,850.9	289,548.9	1,016.8	75,797.7	7,867.7	365,346.5	79.3%	47,082.6
8.67	8.66	6,779.9	296,328.8	1,045.2	76,842.9	7,825.1	373,171.7	79.4%	46,814.9
8.83	8.83	6,702.1	303,030.9	1,076.4	77,919.3	7,778.5	380,950.1	79.5%	46,522.4
9.00	9.00	6,617.3	309,648.2	1,110.3	79,029.5	7,727.6	388,677.7	79.7%	46,204.2
9.17	9.16	6,525.2	316,173.4	1,147.1	80,176.7	7,672.3	396,350.0	79.8%	45,859.2
9.33	9.33	6,425.6	322,598.9	1,187.0	81,363.6	7,612.5	403,962.6	79.9%	45,486.3
9.50	9.50	6,317.9	328,916.9	1,230.0	82,593.7	7,548.0	411,510.5	79.9%	45,084.1
9.67	9.66	6,201.9	335,118.8	1,276.4	83,870.1	7,478.4	418,988.9	80.0%	44,650.9
9.83	9.83	6,077.1	341,195.9	1,326.4	85,196.4	7,403.5	426,392.3	80.0%	44,184.9
10.00	10.00	5,942.9	347,138.7	1,380.1	86,576.5	7,322.9	433,715.2	80.0%	43,684.0
10.17	10.16	5,798.6	352,937.3	1,437.8	88,014.3	7,236.3	440,951.6	80.0%	43,145.5
10.33	10.33	5,643.4	358,580.7	1,499.8	89,514.1	7,143.3	448,094.8	80.0%	42,566.5
10.50	10.50	5,476.5	364,057.3	1,566.6	91,080.7	7,043.1	455,138.0	80.0%	41,943.3
10.67	10.66	5,296.8	369,354.1	1,638.5	92,719.2	6,935.3	462,073.2	79.9%	41,271.6
10.83	10.83	5,102.8	374,456.9	1,716.1	94,435.2	6,818.9	468,892.2	79.9%	40,545.8
11.00	11.00	4,893.0	379,349.9	1,800.0	96,235.3	6,693.0	475,585.1	79.8%	39,759.1
11.17	11.16	4,665.0	384,014.9	1,891.2	98,126.5	6,556.2	482,141.3	79.6%	38,902.8
11.33	11.33	4,416.2	388,431.0	1,990.7	100,117.2	6,406.9	488,548.2	79.5%	37,965.3
11.50	11.50	4,142.7	392,573.7	2,100.1	102,217.3	6,242.8	494,791.0	79.3%	36,930.7
11.67	11.66	3,839.3	396,413.0	2,221.5	104,438.8	6,060.8	500,851.8	79.1%	35,776.3
11.83	11.83	3,498.2	399,911.2	2,357.9	106,796.7	5,856.1	506,707.9	78.9%	34,467.2
12.00	12.00	3,106.7	403,017.9	2,514.5	109,311.2	5,621.2	512,329.2	78.7%	32,945.4
12.17	12.16	2,642.5	405,660.4	2,700.2	112,011.4	5,342.7	517,671.9	78.4%	31,097.9
12.33	12.33	2,055.1	407,715.5	2,935.2	114,946.6	4,990.2	522,662.1	78.0%	28,635.3
12.50	12.50	1,131.3	408,846.9	3,304.7	118,251.3	4,436.0	527,098.1	77.6%	22,543.2
12.67	12.66	0.0	408,846.9	3,757.2	122,008.5	3,757.2	530,855.3	77.0%	22,543.2
12.83	12.83	0.0	408,846.9	3,757.2	125,765.7	3,757.2	534,612.5	76.5%	22,543.2
13.00	13.00	0.0	408,846.9	3,757.2	129,522.9	3,757.2	538,369.7	75.9%	22,543.2

Hydrograph Report

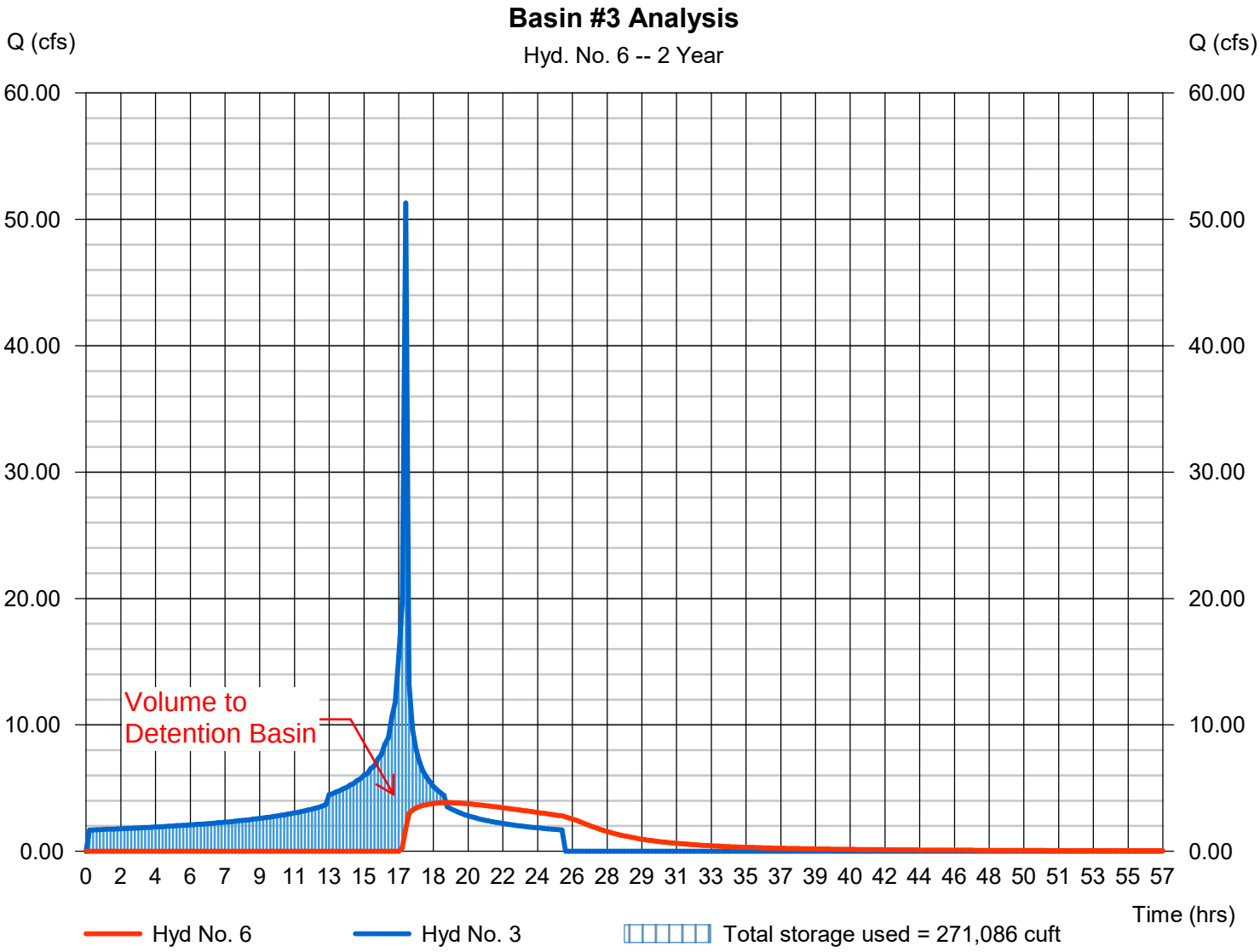
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Friday, 12 / 23 / 2022

Hyd. No. 6

Basin #3 Analysis

Hydrograph type	=	Reservoir	Peak discharge	=	3.854 cfs
Storm frequency	=	2 yrs	Time to peak	=	19.07 hrs
Time interval	=	11 min	Hyd. volume	=	153,535 cuft
Inflow hyd. No.	=	3 - Post A3	Max. Elevation	=	106.54 ft
Reservoir name	=	DA A3 - Detention Basin #3	Max. Storage	=	271,086 cuft

Storage Indication method used.



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**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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                          Analysis prepared by:

                    Kimley-Horn and Associates, Inc.
                           765 The City Drive
                               Suite 200
                            Orange, CA 92868

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

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  BASIN ANALYSIS
  POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A3
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   57.97
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.190
    LOW LOSS FRACTION = 0.277
    TIME OF CONCENTRATION(MIN.) = 10.56
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.52
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.92
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.33
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.44

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.72
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     4.06

**************************************************************************
  TIME     VOLUME       Q    0.       15.0      30.0      45.0      60.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.16      0.0122      1.68  .Q        .         .         .         .
  0.34      0.0367      1.69  .Q        .         .         .         .
```

0.51	0.0614	1.70	.Q	.	.	.	.
0.69	0.0862	1.71	.Q	.	.	.	.
0.86	0.1112	1.72	.Q	.	.	.	.
1.04	0.1363	1.74	.Q	.	.	.	.
1.22	0.1616	1.74	.Q	.	.	.	.
1.39	0.1871	1.76	.Q	.	.	.	.
1.57	0.2127	1.77	.Q	.	.	.	.
1.74	0.2386	1.78	.Q	.	.	.	.
1.92	0.2646	1.79	.Q	.	.	.	.
2.10	0.2907	1.81	.Q	.	.	.	.
2.27	0.3171	1.82	.Q	.	.	.	.
2.45	0.3436	1.83	.Q	.	.	.	.
2.62	0.3704	1.84	.Q	.	.	.	.
2.80	0.3973	1.86	.Q	.	.	.	.
2.98	0.4245	1.87	.Q	.	.	.	.
3.15	0.4518	1.89	.Q	.	.	.	.
3.33	0.4794	1.90	.Q	.	.	.	.
3.50	0.5071	1.92	.Q	.	.	.	.
3.68	0.5351	1.93	.Q	.	.	.	.
3.86	0.5633	1.95	.Q	.	.	.	.
4.03	0.5918	1.96	.Q	.	.	.	.
4.21	0.6204	1.98	.Q	.	.	.	.
4.38	0.6493	1.99	.Q	.	.	.	.
4.56	0.6785	2.02	.Q	.	.	.	.
4.74	0.7079	2.03	.Q	.	.	.	.
4.91	0.7375	2.05	.Q	.	.	.	.
5.09	0.7675	2.06	.Q	.	.	.	.
5.26	0.7977	2.09	.Q	.	.	.	.
5.44	0.8281	2.10	.Q	.	.	.	.
5.62	0.8589	2.13	.Q	.	.	.	.
5.79	0.8899	2.14	.Q	.	.	.	.
5.97	0.9212	2.17	.Q	.	.	.	.
6.14	0.9529	2.18	.Q	.	.	.	.
6.32	0.9848	2.21	.Q	.	.	.	.
6.50	1.0171	2.23	.Q	.	.	.	.
6.67	1.0497	2.26	.Q	.	.	.	.
6.85	1.0827	2.27	.Q	.	.	.	.
7.02	1.1160	2.31	.Q	.	.	.	.
7.20	1.1497	2.32	.Q	.	.	.	.
7.38	1.1837	2.36	.Q	.	.	.	.
7.55	1.2182	2.38	.Q	.	.	.	.
7.73	1.2530	2.41	.Q	.	.	.	.
7.90	1.2882	2.43	.Q	.	.	.	.
8.08	1.3239	2.47	.Q	.	.	.	.
8.26	1.3600	2.49	.Q	.	.	.	.
8.43	1.3966	2.54	.Q	.	.	.	.
8.61	1.4336	2.56	.Q	.	.	.	.
8.78	1.4712	2.60	.Q	.	.	.	.
8.96	1.5092	2.63	.Q	.	.	.	.
9.14	1.5478	2.68	.Q	.	.	.	.

9.31	1.5869	2.70	.Q . . . .
9.49	1.6265	2.76	.Q . . . .
9.66	1.6668	2.78	.Q . . . .
9.84	1.7077	2.84	.Q . . . .
10.02	1.7493	2.87	.Q . . . .
10.19	1.7915	2.93	.Q . . . .
10.37	1.8344	2.97	.Q . . . .
10.54	1.8781	3.04	. Q . . . .
10.72	1.9225	3.07	. Q . . . .
10.90	1.9678	3.15	. Q . . . .
11.07	2.0139	3.19	. Q . . . .
11.25	2.0610	3.28	. Q . . . .
11.42	2.1090	3.32	. Q . . . .
11.60	2.1580	3.42	. Q . . . .
11.78	2.2081	3.47	. Q . . . .
11.95	2.2593	3.58	. Q . . . .
12.13	2.3123	3.70	. Q . . . .
12.30	2.3719	4.49	. Q . . . .
12.48	2.4378	4.56	. Q . . . .
12.66	2.5052	4.71	. Q . . . .
12.83	2.5742	4.78	. Q . . . .
13.01	2.6450	4.95	. Q . . . .
13.18	2.7177	5.04	. Q . . . .
13.36	2.7925	5.24	. Q . . . .
13.54	2.8695	5.35	. Q . . . .
13.71	2.9491	5.59	. Q . . . .
13.89	3.0314	5.73	. Q . . . .
14.06	3.1169	6.03	. Q . . . .
14.24	3.2055	6.15	. Q . . . .
14.42	3.2979	6.55	. Q . . . .
14.59	3.3948	6.78	. Q . . . .
14.77	3.4973	7.32	. Q . . . .
14.94	3.6061	7.64	. Q . . . .
15.12	3.7232	8.46	. Q . . . .
15.30	3.8500	8.98	. Q . . . .
15.47	3.9926	10.63	. Q . . . .
15.65	4.1556	11.78	. Q . . . .
15.82	4.3528	15.34	. Q . . .
16.00	4.6071	19.63	. . Q . . .
16.18	5.1230	51.31	. . . . Q .
16.35	5.5924	13.24	. Q . . . .
16.53	5.7587	9.62	. Q . . . .
16.70	5.8870	8.02	. Q . . . .
16.88	5.9964	7.03	. Q . . . .
17.06	6.0936	6.34	. Q . . . .
17.23	6.1825	5.87	. Q . . . .
17.41	6.2650	5.47	. Q . . . .
17.58	6.3421	5.14	. Q . . . .
17.76	6.4149	4.87	. Q . . . .
17.94	6.4839	4.63	. Q . . . .

18.11	6.5498	4.43	. Q	.	.	.	.
18.29	6.6077	3.52	. Q	.	.	.	.
18.46	6.6578	3.37	. Q	.	.	.	.
18.64	6.7058	3.23	. Q	.	.	.	.
18.82	6.7520	3.11	. Q	.	.	.	.
18.99	6.7964	3.00	. Q	.	.	.	.
19.17	6.8394	2.90	.Q	.	.	.	.
19.34	6.8809	2.81	.Q	.	.	.	.
19.52	6.9212	2.73	.Q	.	.	.	.
19.70	6.9603	2.65	.Q	.	.	.	.
19.87	6.9984	2.58	.Q	.	.	.	.
20.05	7.0354	2.51	.Q	.	.	.	.
20.22	7.0715	2.45	.Q	.	.	.	.
20.40	7.1068	2.39	.Q	.	.	.	.
20.58	7.1412	2.34	.Q	.	.	.	.
20.75	7.1749	2.29	.Q	.	.	.	.
20.93	7.2079	2.24	.Q	.	.	.	.
21.10	7.2401	2.20	.Q	.	.	.	.
21.28	7.2718	2.15	.Q	.	.	.	.
21.46	7.3028	2.11	.Q	.	.	.	.
21.63	7.3333	2.08	.Q	.	.	.	.
21.81	7.3632	2.04	.Q	.	.	.	.
21.98	7.3926	2.00	.Q	.	.	.	.
22.16	7.4215	1.97	.Q	.	.	.	.
22.34	7.4500	1.94	.Q	.	.	.	.
22.51	7.4780	1.91	.Q	.	.	.	.
22.69	7.5055	1.88	.Q	.	.	.	.
22.86	7.5327	1.85	.Q	.	.	.	.
23.04	7.5594	1.83	.Q	.	.	.	.
23.22	7.5858	1.80	.Q	.	.	.	.
23.39	7.6118	1.77	.Q	.	.	.	.
23.57	7.6374	1.75	.Q	.	.	.	.
23.74	7.6627	1.73	.Q	.	.	.	.
23.92	7.6877	1.71	.Q	.	.	.	.
24.10	7.7123	1.68	.Q	.	.	.	.
24.27	7.7246	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%	1446.7
10%	264.0
20%	63.4
30%	21.1
40%	10.6

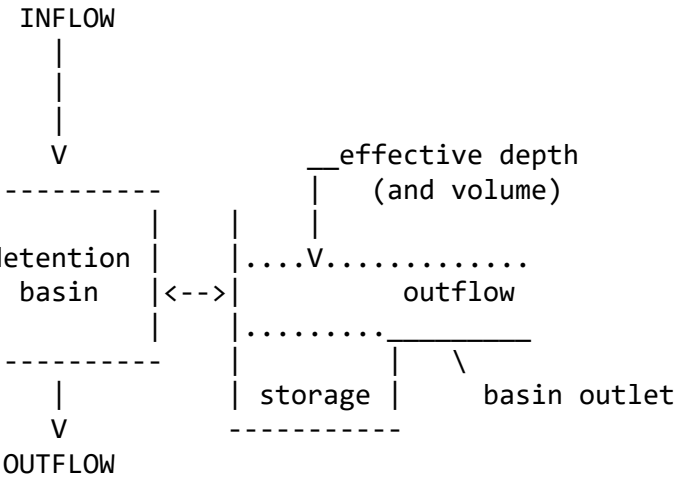
50%	10.6
60%	10.6
70%	10.6
80%	10.6
90%	10.6

Problem Descriptions:
PACIFIC COMMERCE CENTER
BASIN ANALYSIS
POST-DEVELOPMENT, 2-YEAR STORM EVENT, DA A3

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 10.560
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 18

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS) **	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS) *
0.000	0.000	0.000**	5.000	4.516	0.000*
5.500	5.067	0.947**	6.000	5.622	2.670*
6.500	6.180	3.781**	7.000	6.737	4.631*
7.500	7.292	6.828**	8.000	7.843	11.340*
8.500	8.387	17.090**	9.000	8.923	22.200*
9.500	9.447	26.090**	10.000	9.957	29.410*
10.500	10.448	32.370**	11.000	10.918	35.060*

```
     *     11.500     11.359     37.560**     12.000     11.762     39.890*
     *     12.500     12.101     42.090**     13.000     12.359     44.180*
-------------------------------------------------------------------------------
     BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:
      INTERVAL   DEPTH   {S-O*DT/2}   {S+O*DT/2}
       NUMBER   (FEET)   (ACRE-FEET)  (ACRE-FEET)
           1     0.00       0.00000      0.00000
           2     5.00       4.51650      4.51650
           3     5.50       5.06051      5.07429
           4     6.00       5.60308      5.64192
           5     6.50       6.15210      6.20710
           6     7.00       6.70312      6.77048
           7     7.50       7.24224      7.34156
           8     8.00       7.76033      7.92527
           9     8.50       8.26291      8.51149
          10     9.00       8.76135      9.08425
          11     9.50       9.25725      9.63675
          12    10.00       9.74281     10.17059
          13    10.50      10.21308     10.68392
          14    11.00      10.66292     11.17288
          15    11.50      11.08564     11.63196
          16    12.00      11.47139     12.05161
          17    12.50      11.79439     12.40661
          18    13.00      12.03799     12.68061
     WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)
-------------------------------------------------------------------------------
     DETENTION BASIN ROUTING RESULTS:
     NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES
           OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE
           AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

        TIME  DEAD-STORAGE  INFLOW  EFFECTIVE  OUTFLOW  EFFECTIVE
       (HRS)   FILLED(AF)    (CFS)  DEPTH(FT)   (CFS)   VOLUME(AF)
-------------------------------------------------------------------------------
       0.160        0.000     1.68      0.03     0.00      0.024
       0.336        0.000     1.69      0.05     0.00      0.049
       0.512        0.000     1.70      0.08     0.00      0.074
       0.688        0.000     1.71      0.11     0.00      0.099
       0.864        0.000     1.72      0.14     0.00      0.124
       1.040        0.000     1.74      0.16     0.00      0.149
       1.216        0.000     1.74      0.19     0.00      0.174
       1.392        0.000     1.76      0.22     0.00      0.200
       1.568        0.000     1.77      0.25     0.00      0.226
       1.744        0.000     1.78      0.28     0.00      0.252
       1.920        0.000     1.79      0.31     0.00      0.278
       2.096        0.000     1.81      0.34     0.00      0.304
       2.272        0.000     1.82      0.37     0.00      0.330
       2.448        0.000     1.83      0.40     0.00      0.357
       2.624        0.000     1.84      0.42     0.00      0.384
       2.800        0.000     1.86      0.45     0.00      0.411
```

2.976	0.000	1.87	0.48	0.00	0.438
3.152	0.000	1.89	0.52	0.00	0.466
3.328	0.000	1.90	0.55	0.00	0.493
3.504	0.000	1.92	0.58	0.00	0.521
3.680	0.000	1.93	0.61	0.00	0.549
3.856	0.000	1.95	0.64	0.00	0.577
4.032	0.000	1.96	0.67	0.00	0.606
4.208	0.000	1.98	0.70	0.00	0.635
4.384	0.000	1.99	0.73	0.00	0.664
4.560	0.000	2.02	0.77	0.00	0.693
4.736	0.000	2.03	0.80	0.00	0.723
4.912	0.000	2.05	0.83	0.00	0.752
5.088	0.000	2.06	0.87	0.00	0.782
5.264	0.000	2.09	0.90	0.00	0.813
5.440	0.000	2.10	0.93	0.00	0.843
5.616	0.000	2.13	0.97	0.00	0.874
5.792	0.000	2.14	1.00	0.00	0.905
5.968	0.000	2.17	1.04	0.00	0.937
6.144	0.000	2.18	1.07	0.00	0.969
6.320	0.000	2.21	1.11	0.00	1.001
6.496	0.000	2.23	1.14	0.00	1.033
6.672	0.000	2.26	1.18	0.00	1.066
6.848	0.000	2.27	1.22	0.00	1.099
7.024	0.000	2.31	1.25	0.00	1.133
7.200	0.000	2.32	1.29	0.00	1.167
7.376	0.000	2.36	1.33	0.00	1.201
7.552	0.000	2.38	1.37	0.00	1.235
7.728	0.000	2.41	1.41	0.00	1.271
7.904	0.000	2.43	1.45	0.00	1.306
8.080	0.000	2.47	1.49	0.00	1.342
8.256	0.000	2.49	1.53	0.00	1.378
8.432	0.000	2.54	1.57	0.00	1.415
8.608	0.000	2.56	1.61	0.00	1.452
8.784	0.000	2.60	1.65	0.00	1.490
8.960	0.000	2.63	1.69	0.00	1.528
9.136	0.000	2.68	1.73	0.00	1.567
9.312	0.000	2.70	1.78	0.00	1.607
9.488	0.000	2.76	1.82	0.00	1.647
9.664	0.000	2.78	1.87	0.00	1.687
9.840	0.000	2.84	1.91	0.00	1.728
10.016	0.000	2.87	1.96	0.00	1.770
10.192	0.000	2.93	2.01	0.00	1.813
10.368	0.000	2.97	2.05	0.00	1.856
10.544	0.000	3.04	2.10	0.00	1.900
10.720	0.000	3.07	2.15	0.00	1.945
10.896	0.000	3.15	2.20	0.00	1.991
11.072	0.000	3.19	2.26	0.00	2.037
11.248	0.000	3.28	2.31	0.00	2.085
11.424	0.000	3.32	2.36	0.00	2.133
11.600	0.000	3.42	2.42	0.00	2.183

11.776	0.000	3.47	2.47	0.00	2.233
11.952	0.000	3.58	2.53	0.00	2.285
12.128	0.000	3.70	2.59	0.00	2.339
12.304	0.000	4.49	2.66	0.00	2.405
12.480	0.000	4.56	2.74	0.00	2.471
12.656	0.000	4.71	2.81	0.00	2.539
12.832	0.000	4.78	2.89	0.00	2.609
13.008	0.000	4.95	2.97	0.00	2.681
13.184	0.000	5.04	3.05	0.00	2.754
13.360	0.000	5.24	3.13	0.00	2.831
13.536	0.000	5.35	3.22	0.00	2.908
13.712	0.000	5.59	3.31	0.00	2.990
13.888	0.000	5.73	3.40	0.00	3.073
14.064	0.000	6.03	3.50	0.00	3.161
14.240	0.000	6.15	3.60	0.00	3.250
14.416	0.000	6.55	3.70	0.00	3.346
14.592	0.000	6.78	3.81	0.00	3.444
14.768	0.000	7.32	3.93	0.00	3.551
14.944	0.000	7.64	4.05	0.00	3.662
15.120	0.000	8.46	4.19	0.00	3.785
15.296	0.000	8.98	4.33	0.00	3.915
15.472	0.000	10.63	4.51	0.00	4.070
15.648	0.000	11.78	4.70	0.00	4.241
15.824	0.000	15.34	4.94	0.00	4.464
16.000	0.000	19.63	5.21	0.20	4.747
16.176	0.000	51.31	5.87	1.30	5.474
16.352	0.000	13.24	6.01	2.45	5.631
16.528	0.000	9.62	6.10	2.79	5.731
16.704	0.000	8.02	6.16	2.96	5.804
16.880	0.000	7.03	6.21	3.09	5.862
17.056	0.000	6.34	6.26	3.19	5.907
17.232	0.000	5.87	6.29	3.28	5.945
17.408	0.000	5.47	6.32	3.34	5.976
17.584	0.000	5.14	6.34	3.40	6.001
17.760	0.000	4.87	6.36	3.45	6.022
17.936	0.000	4.63	6.37	3.48	6.039
18.112	0.000	4.43	6.39	3.51	6.052
18.288	0.000	3.52	6.39	3.53	6.052
18.464	0.000	3.37	6.38	3.52	6.050
18.640	0.000	3.23	6.38	3.52	6.046
18.816	0.000	3.11	6.37	3.51	6.040
18.992	0.000	3.00	6.37	3.50	6.033
19.168	0.000	2.90	6.36	3.48	6.024
19.344	0.000	2.81	6.35	3.46	6.015
19.520	0.000	2.73	6.34	3.44	6.004
19.696	0.000	2.65	6.33	3.42	5.993
19.872	0.000	2.58	6.32	3.40	5.981
20.048	0.000	2.51	6.31	3.37	5.969
20.224	0.000	2.45	6.30	3.35	5.956
20.400	0.000	2.39	6.29	3.32	5.942

20.576	0.000	2.34	6.27	3.29	5.928
20.752	0.000	2.29	6.26	3.27	5.914
20.928	0.000	2.24	6.25	3.24	5.900
21.104	0.000	2.20	6.24	3.21	5.885
21.280	0.000	2.15	6.22	3.18	5.870
21.456	0.000	2.11	6.21	3.15	5.855
21.632	0.000	2.08	6.20	3.12	5.840
21.808	0.000	2.04	6.18	3.09	5.825
21.984	0.000	2.00	6.17	3.06	5.809
22.160	0.000	1.97	6.15	3.03	5.794
22.336	0.000	1.94	6.14	3.00	5.779
22.512	0.000	1.91	6.13	2.97	5.763
22.688	0.000	1.88	6.11	2.94	5.748
22.864	0.000	1.85	6.10	2.90	5.733
23.040	0.000	1.83	6.09	2.87	5.717
23.216	0.000	1.80	6.07	2.84	5.702
23.392	0.000	1.77	6.06	2.81	5.687
23.568	0.000	1.75	6.04	2.78	5.672
23.744	0.000	1.73	6.03	2.75	5.657
23.920	0.000	1.71	6.02	2.72	5.642
24.096	0.000	1.68	6.00	2.69	5.628
24.272	0.000	0.00	5.97	2.62	5.589

Appendix J.II

BMP Analysis
100-Year Storm

Hydrograph Report

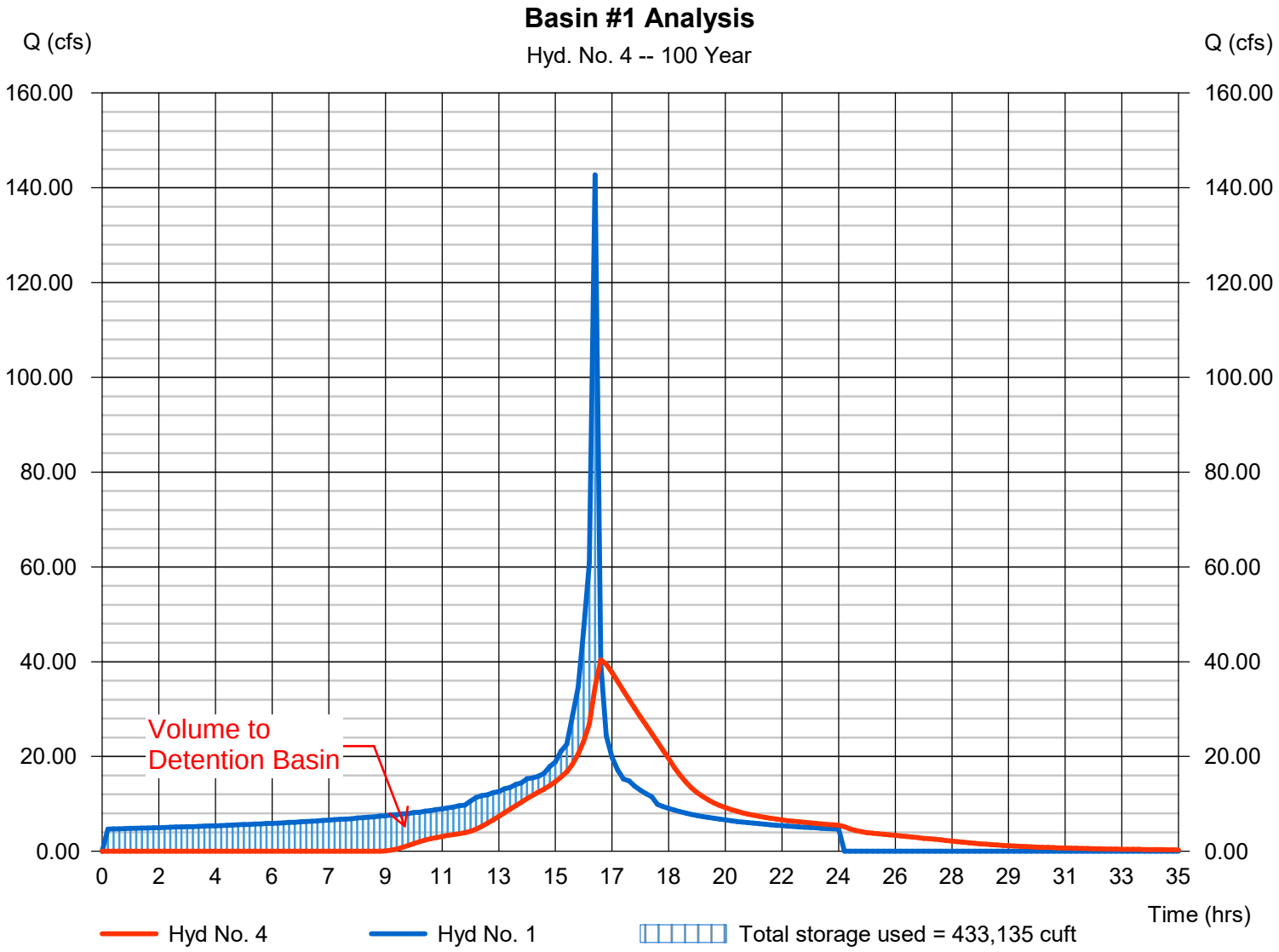
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Friday, 12 / 23 / 2022

Hyd. No. 4

Basin #1 Analysis

Hydrograph type	= Reservoir	Peak discharge	= 40.38 cfs
Storm frequency	= 100 yrs	Time to peak	= 16.13 hrs
Time interval	= 11 min	Hyd. volume	= 730,114 cuft
Inflow hyd. No.	= 1 - Post A1	Max. Elevation	= 112.19 ft
Reservoir name	= DA A1 - Detention Basin #1	Max. Storage	= 433,135 cuft

Storage Indication method used.



```
**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
         (C) Copyright 1989-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                    Kimley-Horn and Associates, Inc.
                           765 The City Drive
                               Suite 200
                            Orange, CA 92868

**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  BASIN ANALYSIS
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A1
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   55.00
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.090
    LOW LOSS FRACTION = 0.127
    TIME OF CONCENTRATION(MIN.) = 11.08
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    21.16
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     5.57

**************************************************************************
  TIME     VOLUME       Q    0.       37.5      75.0     112.5     150.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.12      0.0000      0.00  Q         .         .         .         .
  0.30      0.0358      4.69  .Q        .         .         .         .
```

0.49	0.1075	4.71	.Q	.	.	.	.
0.67	0.1798	4.75	.Q	.	.	.	.
0.86	0.2525	4.77	.Q	.	.	.	.
1.04	0.3257	4.82	.Q	.	.	.	.
1.23	0.3993	4.84	.Q	.	.	.	.
1.41	0.4735	4.88	.Q	.	.	.	.
1.60	0.5483	4.91	.Q	.	.	.	.
1.78	0.6235	4.95	.Q	.	.	.	.
1.97	0.6993	4.98	.Q	.	.	.	.
2.15	0.7756	5.03	.Q	.	.	.	.
2.33	0.8525	5.05	.Q	.	.	.	.
2.52	0.9300	5.10	.Q	.	.	.	.
2.70	1.0080	5.13	.Q	.	.	.	.
2.89	1.0867	5.18	.Q	.	.	.	.
3.07	1.1660	5.21	.Q	.	.	.	.
3.26	1.2459	5.26	.Q	.	.	.	.
3.44	1.3264	5.29	.Q	.	.	.	.
3.63	1.4076	5.35	.Q	.	.	.	.
3.81	1.4894	5.38	.Q	.	.	.	.
4.00	1.5720	5.44	.Q	.	.	.	.
4.18	1.6552	5.47	.Q	.	.	.	.
4.37	1.7391	5.53	.Q	.	.	.	.
4.55	1.8238	5.56	.Q	.	.	.	.
4.74	1.9093	5.63	.Q	.	.	.	.
4.92	1.9955	5.67	.Q	.	.	.	.
5.10	2.0825	5.74	.Q	.	.	.	.
5.29	2.1703	5.77	.Q	.	.	.	.
5.47	2.2589	5.85	.Q	.	.	.	.
5.66	2.3484	5.88	.Q	.	.	.	.
5.84	2.4388	5.96	.Q	.	.	.	.
6.03	2.5301	6.00	.Q	.	.	.	.
6.21	2.6223	6.08	.Q	.	.	.	.
6.40	2.7155	6.13	.Q	.	.	.	.
6.58	2.8097	6.21	.Q	.	.	.	.
6.77	2.9049	6.26	.Q	.	.	.	.
6.95	3.0011	6.35	.Q	.	.	.	.
7.14	3.0984	6.40	.Q	.	.	.	.
7.32	3.1968	6.50	.Q	.	.	.	.
7.51	3.2964	6.55	.Q	.	.	.	.
7.69	3.3971	6.66	.Q	.	.	.	.
7.87	3.4991	6.71	.Q	.	.	.	.
8.06	3.6024	6.82	.Q	.	.	.	.
8.24	3.7070	6.88	.Q	.	.	.	.
8.43	3.8129	7.00	.Q	.	.	.	.
8.61	3.9203	7.07	.Q	.	.	.	.
8.80	4.0291	7.20	.Q	.	.	.	.
8.98	4.1395	7.27	.Q	.	.	.	.
9.17	4.2514	7.41	.Q	.	.	.	.
9.35	4.3650	7.48	.Q	.	.	.	.
9.54	4.4804	7.64	. Q	.	.	.	.

9.72	4.5975	7.72	. Q	.	.	.	.	
9.91	4.7166	7.88	. Q	.	.	.	.	
10.09	4.8376	7.97	. Q	.	.	.	.	
10.28	4.9607	8.16	. Q	.	.	.	.	
10.46	5.0859	8.25	. Q	.	.	.	.	
10.64	5.2134	8.46	. Q	.	.	.	.	
10.83	5.3433	8.57	. Q	.	.	.	.	
11.01	5.4758	8.79	. Q	.	.	.	.	
11.20	5.6109	8.91	. Q	.	.	.	.	
11.38	5.7489	9.17	. Q	.	.	.	.	
11.57	5.8899	9.30	. Q	.	.	.	.	
11.75	6.0340	9.59	. Q	.	.	.	.	
11.94	6.1816	9.74	. Q	.	.	.	.	
12.12	6.3369	10.61	. Q	.	.	.	.	
12.31	6.5043	11.34	. Q	.	.	.	.	
12.49	6.6803	11.72	. Q	.	.	.	.	
12.68	6.8607	11.93	. Q	.	.	.	.	
12.86	7.0462	12.38	. Q	.	.	.	.	
13.05	7.2369	12.62	. Q	.	.	.	.	
13.23	7.4336	13.16	. Q	.	.	.	.	
13.41	7.6367	13.45	. Q	.	.	.	.	
13.60	7.8469	14.10	. Q	.	.	.	.	
13.78	8.0649	14.47	. Q	.	.	.	.	
13.97	8.2919	15.28	. Q	.	.	.	.	
14.15	8.5268	15.50	. Q	.	.	.	.	
14.34	8.7658	15.81	. Q	.	.	.	.	
14.52	9.0119	16.44	. Q	.	.	.	.	
14.71	9.2741	17.92	. Q	.	.	.	.	
14.89	9.5545	18.82	. Q	.	.	.	.	
15.08	9.8591	21.10	. Q	.	.	.	.	
15.26	10.1923	22.57	. Q	.	.	.	.	
15.45	10.5822	28.52	. Q	.	.	.	.	
15.63	11.0641	34.64	. Q	.	.	.	.	
15.82	11.6846	46.68	. Q	.	.	.	.	
16.00	12.5057	60.91	. Q	.	.	.	.	
16.18	14.0594	142.70	. Q	.	.	.	Q	.
16.37	15.4499	39.51	. Q	.	.	.	.	
16.55	15.9375	24.39	. Q	.	.	.	.	
16.74	16.2752	19.87	. Q	.	.	.	.	
16.92	16.5575	17.13	. Q	.	.	.	.	
17.11	16.8047	15.26	. Q	.	.	.	.	
17.29	17.0345	14.86	. Q	.	.	.	.	
17.48	17.2529	13.76	. Q	.	.	.	.	
17.66	17.4562	12.88	. Q	.	.	.	.	
17.85	17.6472	12.15	. Q	.	.	.	.	
18.03	17.8278	11.52	. Q	.	.	.	.	
18.22	17.9913	9.91	. Q	.	.	.	.	
18.40	18.1390	9.44	. Q	.	.	.	.	
18.59	18.2800	9.04	. Q	.	.	.	.	
18.77	18.4152	8.68	. Q	.	.	.	.	

18.95	18.5452	8.35	. Q	.	.	.	.
19.14	18.6704	8.06	. Q	.	.	.	.
19.32	18.7915	7.80	. Q	.	.	.	.
19.51	18.9087	7.56	. Q	.	.	.	.
19.69	19.0223	7.34	.Q	.	.	.	.
19.88	19.1327	7.13	.Q	.	.	.	.
20.06	19.2401	6.94	.Q	.	.	.	.
20.25	19.3447	6.77	.Q	.	.	.	.
20.43	19.4467	6.60	.Q	.	.	.	.
20.62	19.5463	6.45	.Q	.	.	.	.
20.80	19.6436	6.30	.Q	.	.	.	.
20.99	19.7388	6.17	.Q	.	.	.	.
21.17	19.8320	6.04	.Q	.	.	.	.
21.36	19.9233	5.92	.Q	.	.	.	.
21.54	20.0128	5.81	.Q	.	.	.	.
21.72	20.1006	5.70	.Q	.	.	.	.
21.91	20.1868	5.60	.Q	.	.	.	.
22.09	20.2715	5.50	.Q	.	.	.	.
22.28	20.3547	5.41	.Q	.	.	.	.
22.46	20.4366	5.32	.Q	.	.	.	.
22.65	20.5171	5.23	.Q	.	.	.	.
22.83	20.5964	5.15	.Q	.	.	.	.
23.02	20.6745	5.08	.Q	.	.	.	.
23.20	20.7514	5.00	.Q	.	.	.	.
23.39	20.8272	4.93	.Q	.	.	.	.
23.57	20.9019	4.86	.Q	.	.	.	.
23.76	20.9756	4.80	.Q	.	.	.	.
23.94	21.0483	4.73	.Q	.	.	.	.
24.13	21.1200	4.67	.Q	.	.	.	.
24.31	21.1557	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)

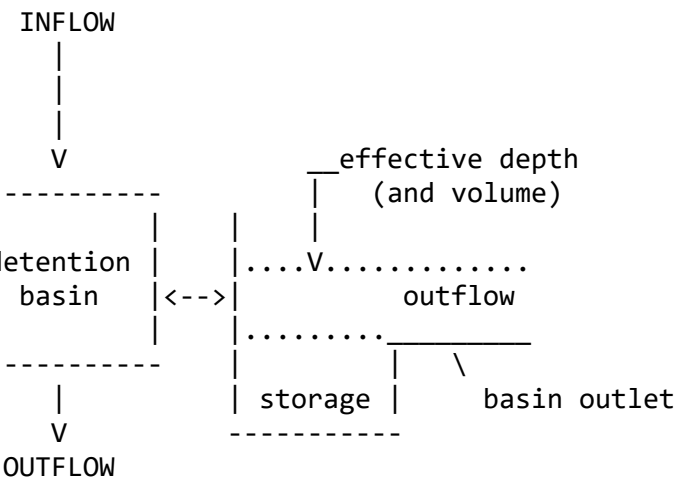
Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1440.4
10%	221.6
20%	55.4
30%	33.2
40%	22.2
50%	11.1
60%	11.1
70%	11.1
80%	11.1
90%	11.1

Problem Descriptions:
PACIFIC COMMERCE CENTER
BASIN ANALYSIS
POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A1

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 11.080
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 17

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000	**	5.500	4.238	0.000	*
6.000	4.702	0.947	**	6.500	5.167	2.674	*
7.000	5.633	3.781	**	7.500	6.097	6.112	*
8.000	6.557	10.710	**	8.500	7.012	16.520	*
9.000	7.460	21.670	**	9.500	7.898	25.600	*
10.000	8.324	28.950	**	10.500	8.736	31.940	*
11.000	9.128	34.650	**	11.500	9.497	37.160	*
12.000	9.834	39.510	**	12.500	10.118	41.720	*
13.000	10.335	43.820	**				

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)

1	0.00	0.00000	0.00000
2	5.50	4.23780	4.23780
3	6.00	4.69447	4.70893
4	6.50	5.14700	5.18780
5	7.00	5.60425	5.66195
6	7.50	6.05036	6.14364
7	8.00	6.47567	6.63913
8	8.50	6.88634	7.13846
9	9.00	7.29474	7.62546
10	9.50	7.70295	8.09365
11	10.00	8.10349	8.54531
12	10.50	8.49187	8.97933
13	11.00	8.86379	9.39261
14	11.50	9.21334	9.78046
15	12.00	9.53231	10.13529
16	12.50	9.79944	10.43616
17	13.00	10.00042	10.66918

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.119	0.000	0.00	0.00	0.00	0.000
0.303	0.000	4.69	0.09	0.00	0.072
0.488	0.000	4.71	0.19	0.00	0.143
0.673	0.000	4.75	0.28	0.00	0.216
0.857	0.000	4.77	0.37	0.00	0.289
1.042	0.000	4.82	0.47	0.00	0.362
1.227	0.000	4.84	0.57	0.00	0.436
1.411	0.000	4.88	0.66	0.00	0.511
1.596	0.000	4.91	0.76	0.00	0.586
1.781	0.000	4.95	0.86	0.00	0.661
1.965	0.000	4.98	0.96	0.00	0.737
2.150	0.000	5.03	1.06	0.00	0.814
2.335	0.000	5.05	1.16	0.00	0.891
2.519	0.000	5.10	1.26	0.00	0.969
2.704	0.000	5.13	1.36	0.00	1.047
2.889	0.000	5.18	1.46	0.00	1.126
3.073	0.000	5.21	1.56	0.00	1.206
3.258	0.000	5.26	1.67	0.00	1.286
3.443	0.000	5.29	1.77	0.00	1.367
3.627	0.000	5.35	1.88	0.00	1.448
3.812	0.000	5.38	1.99	0.00	1.530
3.997	0.000	5.44	2.09	0.00	1.613
4.181	0.000	5.47	2.20	0.00	1.697

4.366	0.000	5.53	2.31	0.00	1.781
4.551	0.000	5.56	2.42	0.00	1.866
4.735	0.000	5.63	2.53	0.00	1.952
4.920	0.000	5.67	2.65	0.00	2.039
5.105	0.000	5.74	2.76	0.00	2.126
5.289	0.000	5.77	2.87	0.00	2.214
5.474	0.000	5.85	2.99	0.00	2.304
5.659	0.000	5.88	3.11	0.00	2.393
5.843	0.000	5.96	3.22	0.00	2.484
6.028	0.000	6.00	3.34	0.00	2.576
6.213	0.000	6.08	3.46	0.00	2.669
6.397	0.000	6.13	3.58	0.00	2.762
6.582	0.000	6.21	3.71	0.00	2.857
6.767	0.000	6.26	3.83	0.00	2.953
6.951	0.000	6.35	3.96	0.00	3.050
7.136	0.000	6.40	4.08	0.00	3.147
7.321	0.000	6.50	4.21	0.00	3.246
7.505	0.000	6.55	4.34	0.00	3.346
7.690	0.000	6.66	4.47	0.00	3.448
7.875	0.000	6.71	4.61	0.00	3.550
8.059	0.000	6.82	4.74	0.00	3.654
8.244	0.000	6.88	4.88	0.00	3.759
8.429	0.000	7.00	5.02	0.00	3.866
8.613	0.000	7.07	5.16	0.00	3.974
8.798	0.000	7.20	5.30	0.00	4.084
8.983	0.000	7.27	5.44	0.00	4.195
9.167	0.000	7.41	5.57	0.07	4.307
9.352	0.000	7.48	5.69	0.25	4.417
9.537	0.000	7.64	5.81	0.48	4.526
9.721	0.000	7.72	5.93	0.70	4.634
9.906	0.000	7.88	6.04	0.95	4.739
10.091	0.000	7.97	6.15	1.28	4.842
10.275	0.000	8.16	6.26	1.65	4.941
10.460	0.000	8.25	6.36	2.01	5.036
10.645	0.000	8.46	6.46	2.36	5.129
10.829	0.000	8.57	6.56	2.67	5.219
11.014	0.000	8.79	6.65	2.90	5.309
11.199	0.000	8.91	6.75	3.12	5.398
11.383	0.000	9.17	6.84	3.33	5.487
11.568	0.000	9.30	6.94	3.54	5.575
11.753	0.000	9.59	7.03	3.79	5.663
11.937	0.000	9.74	7.12	4.15	5.749
12.122	0.000	10.61	7.22	4.59	5.841
12.307	0.000	11.34	7.33	5.06	5.936
12.491	0.000	11.72	7.43	5.54	6.031
12.676	0.000	11.93	7.53	6.06	6.120
12.861	0.000	12.38	7.62	6.77	6.206
13.045	0.000	12.62	7.70	7.58	6.283
13.230	0.000	13.16	7.78	8.33	6.356
13.415	0.000	13.45	7.85	9.04	6.424

13.599	0.000	14.10	7.93	9.71	6.491
13.784	0.000	14.47	8.00	10.36	6.553
13.969	0.000	15.28	8.07	11.07	6.618
14.153	0.000	15.50	8.13	11.84	6.674
14.338	0.000	15.81	8.18	12.51	6.724
14.523	0.000	16.44	8.24	13.16	6.774
14.707	0.000	17.92	8.31	13.87	6.836
14.892	0.000	18.82	8.38	14.67	6.899
15.077	0.000	21.10	8.47	15.61	6.983
15.261	0.000	22.57	8.57	16.68	7.073
15.446	0.000	28.52	8.74	18.13	7.231
15.631	0.000	34.64	8.99	20.30	7.450
15.815	0.000	46.68	9.40	23.18	7.809
16.000	0.000	60.91	10.00	26.89	8.328
16.185	0.000	142.70	12.25	34.79	9.975
16.369	0.000	39.51	12.22	40.55	9.959
16.554	0.000	24.39	11.84	39.62	9.727
16.739	0.000	19.87	11.44	37.81	9.453
16.923	0.000	17.13	11.05	35.89	9.167
17.108	0.000	15.26	10.69	33.93	8.882
17.293	0.000	14.86	10.36	32.02	8.620
17.477	0.000	13.76	10.05	30.19	8.369
17.662	0.000	12.88	9.78	28.36	8.133
17.847	0.000	12.15	9.52	26.58	7.913
18.031	0.000	11.52	9.28	24.81	7.710
18.216	0.000	9.91	9.06	23.01	7.510
18.401	0.000	9.44	8.86	21.15	7.331
18.585	0.000	9.04	8.68	19.29	7.175
18.770	0.000	8.68	8.53	17.60	7.038
18.955	0.000	8.35	8.40	16.08	6.921
19.139	0.000	8.06	8.29	14.70	6.819
19.324	0.000	7.80	8.19	13.50	6.732
19.509	0.000	7.56	8.11	12.46	6.657
19.693	0.000	7.34	8.04	11.57	6.593
19.878	0.000	7.13	7.98	10.83	6.536
20.063	0.000	6.94	7.92	10.25	6.486
20.247	0.000	6.77	7.87	9.77	6.440
20.432	0.000	6.60	7.83	9.33	6.398
20.617	0.000	6.45	7.79	8.93	6.360
20.801	0.000	6.30	7.75	8.57	6.326
20.986	0.000	6.17	7.71	8.24	6.294
21.171	0.000	6.04	7.68	7.94	6.265
21.355	0.000	5.92	7.65	7.66	6.239
21.540	0.000	5.81	7.63	7.41	6.214
21.725	0.000	5.70	7.60	7.17	6.192
21.909	0.000	5.60	7.58	6.96	6.171
22.094	0.000	5.50	7.56	6.76	6.152
22.279	0.000	5.41	7.54	6.57	6.134
22.463	0.000	5.32	7.52	6.40	6.118
22.648	0.000	5.23	7.51	6.24	6.102

22.833	0.000	5.15	7.49	6.12	6.088
23.017	0.000	5.08	7.47	6.03	6.073
23.202	0.000	5.00	7.46	5.96	6.059
23.387	0.000	4.93	7.44	5.88	6.044
23.571	0.000	4.86	7.43	5.81	6.030
23.756	0.000	4.80	7.41	5.74	6.015
23.941	0.000	4.73	7.40	5.67	6.001
24.125	0.000	4.67	7.38	5.59	5.987
24.310	0.000	0.00	7.29	5.35	5.905

Hydrograph Report

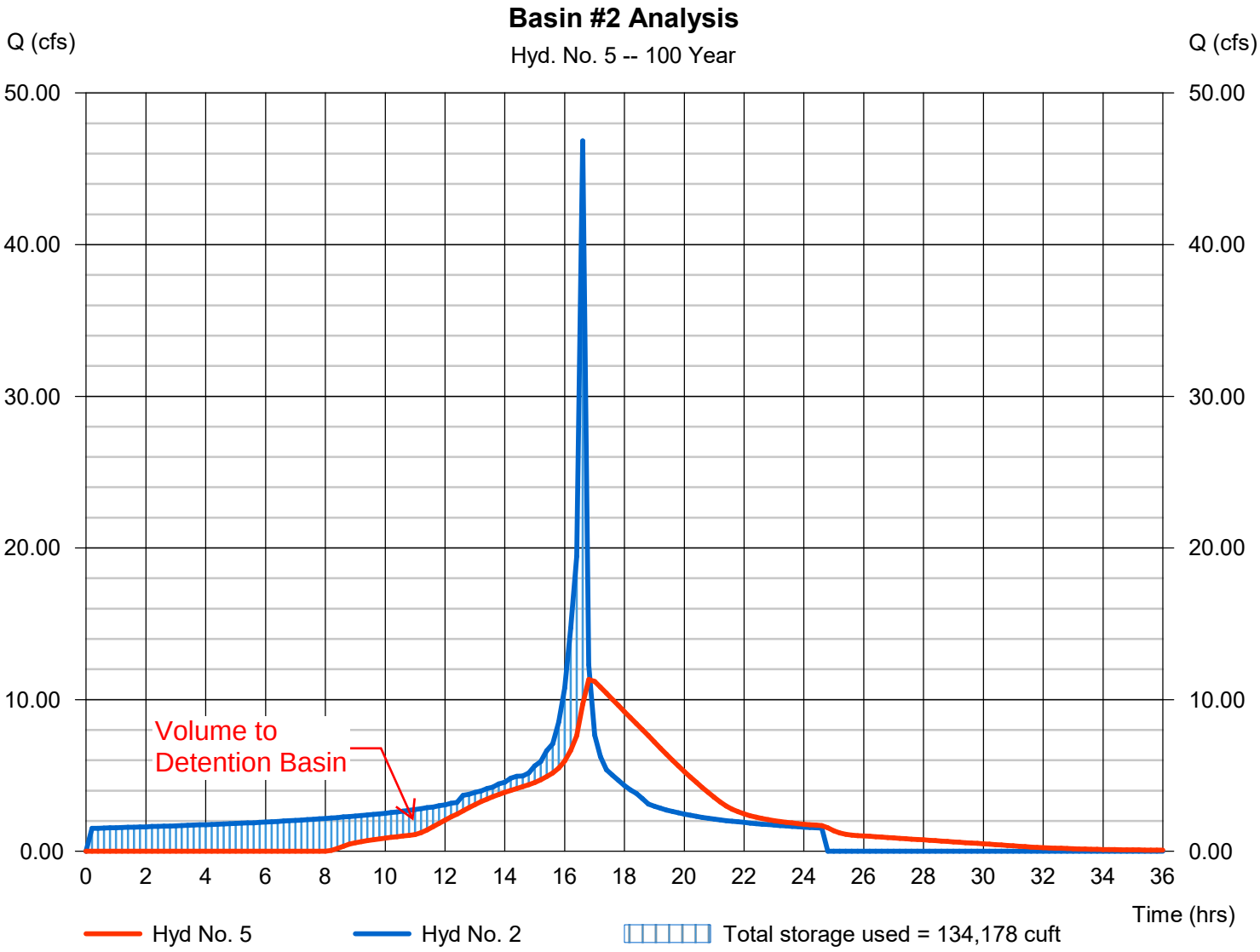
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Friday, 12 / 23 / 2022

Hyd. No. 5

Basin #2 Analysis

Hydrograph type	=	Reservoir	Peak discharge	=	11.32 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.80 hrs
Time interval	=	12 min	Hyd. volume	=	256,424 cuft
Inflow hyd. No.	=	2 - Post A2	Max. Elevation	=	112.40 ft
Reservoir name	=	DA A2 - Detention Basin #2	Max. Storage	=	134,178 cuft

Storage Indication method used.



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**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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                          Analysis prepared by:

                    Kimley-Horn and Associates, Inc.
                           765 The City Drive
                               Suite 200
                            Orange, CA 92868

**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  BASIN ANALYSIS
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A2
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   18.95
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.143
    LOW LOSS FRACTION = 0.178
    TIME OF CONCENTRATION(MIN.) = 11.77
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     6.90
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.30

**************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.11      0.0069      1.51  .Q        .         .         .         .
  0.31      0.0315      1.52  .Q        .         .         .         .
```

0.50	0.0562	1.53	.Q	.	.	.	.
0.70	0.0811	1.54	.Q	.	.	.	.
0.90	0.1062	1.55	.Q	.	.	.	.
1.09	0.1314	1.56	.Q	.	.	.	.
1.29	0.1569	1.58	.Q	.	.	.	.
1.48	0.1825	1.58	.Q	.	.	.	.
1.68	0.2083	1.60	.Q	.	.	.	.
1.88	0.2343	1.61	.Q	.	.	.	.
2.07	0.2605	1.63	.Q	.	.	.	.
2.27	0.2870	1.63	.Q	.	.	.	.
2.46	0.3136	1.65	.Q	.	.	.	.
2.66	0.3404	1.66	.Q	.	.	.	.
2.86	0.3675	1.68	.Q	.	.	.	.
3.05	0.3947	1.69	.Q	.	.	.	.
3.25	0.4222	1.71	.Q	.	.	.	.
3.45	0.4500	1.72	.Q	.	.	.	.
3.64	0.4780	1.74	.Q	.	.	.	.
3.84	0.5062	1.75	.Q	.	.	.	.
4.03	0.5347	1.77	.Q	.	.	.	.
4.23	0.5634	1.78	.Q	.	.	.	.
4.43	0.5924	1.80	.Q	.	.	.	.
4.62	0.6216	1.81	.Q	.	.	.	.
4.82	0.6512	1.83	.Q	.	.	.	.
5.01	0.6810	1.85	.Q	.	.	.	.
5.21	0.7111	1.87	.Q	.	.	.	.
5.41	0.7415	1.88	.Q	.	.	.	.
5.60	0.7723	1.91	.Q	.	.	.	.
5.80	0.8033	1.92	.Q	.	.	.	.
6.00	0.8347	1.95	.Q	.	.	.	.
6.19	0.8664	1.96	.Q	.	.	.	.
6.39	0.8985	1.99	.Q	.	.	.	.
6.58	0.9309	2.01	.Q	.	.	.	.
6.78	0.9637	2.04	.Q	.	.	.	.
6.98	0.9969	2.05	.Q	.	.	.	.
7.17	1.0305	2.09	.Q	.	.	.	.
7.37	1.0644	2.10	.Q	.	.	.	.
7.56	1.0989	2.14	.Q	.	.	.	.
7.76	1.1337	2.16	.Q	.	.	.	.
7.96	1.1690	2.20	.Q	.	.	.	.
8.15	1.2048	2.22	.Q	.	.	.	.
8.35	1.2411	2.26	.Q	.	.	.	.
8.55	1.2778	2.28	.Q	.	.	.	.
8.74	1.3152	2.32	.Q	.	.	.	.
8.94	1.3530	2.35	.Q	.	.	.	.
9.13	1.3915	2.40	.Q	.	.	.	.
9.33	1.4305	2.42	.Q	.	.	.	.
9.53	1.4702	2.47	.Q	.	.	.	.
9.72	1.5105	2.50	. Q	.	.	.	.
9.92	1.5515	2.56	. Q	.	.	.	.
10.11	1.5932	2.59	. Q	.	.	.	.

10.31	1.6357	2.65	. Q . . . .
10.51	1.6790	2.69	. Q . . . .
10.70	1.7232	2.76	. Q . . . .
10.90	1.7682	2.80	. Q . . . .
11.10	1.8142	2.88	. Q . . . .
11.29	1.8611	2.92	. Q . . . .
11.49	1.9092	3.01	. Q . . . .
11.68	1.9584	3.06	. Q . . . .
11.88	2.0087	3.16	. Q . . . .
12.08	2.0604	3.22	. Q . . . .
12.27	2.1164	3.69	. Q . . . .
12.47	2.1767	3.75	. Q . . . .
12.67	2.2387	3.89	. Q . . . .
12.86	2.3024	3.97	. Q . . . .
13.06	2.3682	4.14	. Q . . . .
13.25	2.4360	4.23	. Q . . . .
13.45	2.5063	4.44	. Q . . . .
13.65	2.5791	4.55	. Q . . . .
13.84	2.6550	4.81	. Q . . . .
14.04	2.7341	4.95	. Q . . . .
14.23	2.8145	4.97	. Q . . . .
14.43	2.8966	5.16	. Q . . . .
14.63	2.9841	5.63	. Q . . . .
14.82	3.0776	5.91	. Q . . . .
15.02	3.1792	6.63	. Q . . . .
15.22	3.2904	7.09	. Q . . . .
15.41	3.4169	8.52	. Q . . . .
15.61	3.5733	10.77	. Q . . . .
15.80	3.7799	14.72	. .Q . . .
16.00	4.0569	19.45	. . Q . . .
16.20	4.5943	46.84	. . . . Q .
16.39	5.0736	12.29	. Q. . . .
16.59	5.2353	7.66	. Q . . . .
16.78	5.3480	6.24	. Q . . . .
16.98	5.4422	5.38	. Q . . . .
17.18	5.5265	5.02	. Q . . . .
17.37	5.6051	4.67	. Q . . . .
17.57	5.6781	4.33	. Q . . . .
17.77	5.7460	4.05	. Q . . . .
17.96	5.8098	3.82	. Q . . . .
18.16	5.8690	3.48	. Q . . . .
18.35	5.9224	3.11	. Q . . . .
18.55	5.9716	2.96	. Q . . . .
18.75	6.0186	2.84	. Q . . . .
18.94	6.0637	2.72	. Q . . . .
19.14	6.1070	2.62	. Q . . . .
19.33	6.1487	2.53	. Q . . . .
19.53	6.1891	2.45	.Q . . . .
19.73	6.2281	2.37	.Q . . . .
19.92	6.2660	2.30	.Q . . . .

20.12	6.3028	2.24	.Q	.	.	.	.
20.32	6.3385	2.18	.Q	.	.	.	.
20.51	6.3734	2.12	.Q	.	.	.	.
20.71	6.4074	2.07	.Q	.	.	.	.
20.90	6.4406	2.02	.Q	.	.	.	.
21.10	6.4730	1.98	.Q	.	.	.	.
21.30	6.5047	1.94	.Q	.	.	.	.
21.49	6.5358	1.90	.Q	.	.	.	.
21.69	6.5662	1.86	.Q	.	.	.	.
21.89	6.5960	1.82	.Q	.	.	.	.
22.08	6.6253	1.79	.Q	.	.	.	.
22.28	6.6540	1.76	.Q	.	.	.	.
22.47	6.6823	1.73	.Q	.	.	.	.
22.67	6.7100	1.70	.Q	.	.	.	.
22.87	6.7373	1.67	.Q	.	.	.	.
23.06	6.7641	1.64	.Q	.	.	.	.
23.26	6.7905	1.62	.Q	.	.	.	.
23.45	6.8165	1.59	.Q	.	.	.	.
23.65	6.8422	1.57	.Q	.	.	.	.
23.85	6.8674	1.55	.Q	.	.	.	.
24.04	6.8923	1.53	.Q	.	.	.	.
24.24	6.9047	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)

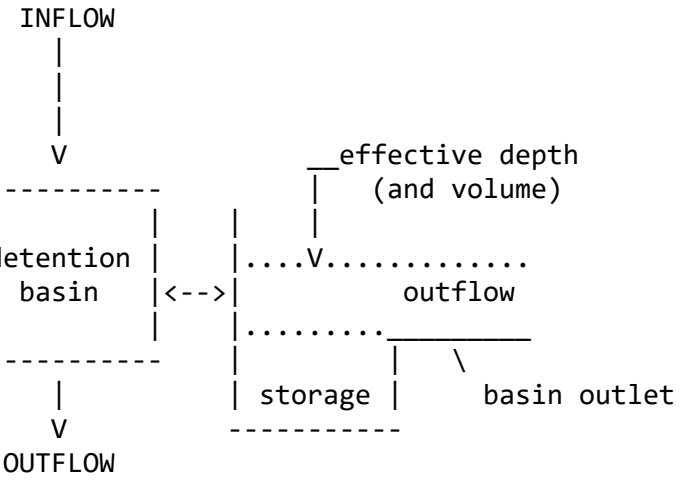
Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1447.7
10%	211.9
20%	58.9
30%	35.3
40%	23.5
50%	11.8
60%	11.8
70%	11.8
80%	11.8
90%	11.8

Problem Descriptions:
PACIFIC COMMERCE CENTER
BASIN ANALYSIS
POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A2

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 11.770
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 18

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000	**	5.000	1.158	0.000	*
5.500	1.298	0.473	**	6.000	1.440	0.819	*
6.500	1.582	1.057	**	7.000	1.725	2.198	*
7.500	1.866	4.092	**	8.000	2.007	5.349	*
8.500	2.146	6.335	**	9.000	2.283	7.178	*
9.500	2.417	7.927	**	10.000	2.547	8.609	*
10.500	2.673	9.240	**	11.000	2.793	9.829	*
11.500	2.906	10.380	**	12.000	3.010	10.910	*
12.500	3.097	11.410	**	13.000	3.165	11.890	*

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	5.00	1.15780	1.15780
3	5.50	1.29467	1.30233
4	6.00	1.43356	1.44684
5	6.50	1.57383	1.59097
6	7.00	1.70678	1.74242
7	7.50	1.83313	1.89947
8	8.00	1.96364	2.05036

9	8.50	2.09465	2.19735
10	9.00	2.22461	2.34099
11	9.50	2.35254	2.48106
12	10.00	2.47731	2.61689
13	10.50	2.59810	2.74790
14	11.00	2.71353	2.87287
15	11.50	2.82216	2.99044
16	12.00	2.92136	3.09824
17	12.50	3.00481	3.18979
18	13.00	3.06842	3.26118

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.110	0.000	1.51	0.11	0.00	0.025
0.307	0.000	1.52	0.21	0.00	0.049
0.503	0.000	1.53	0.32	0.00	0.074
0.699	0.000	1.54	0.43	0.00	0.099
0.895	0.000	1.55	0.54	0.00	0.124
1.091	0.000	1.56	0.65	0.00	0.149
1.287	0.000	1.58	0.76	0.00	0.175
1.484	0.000	1.58	0.87	0.00	0.201
1.680	0.000	1.60	0.98	0.00	0.227
1.876	0.000	1.61	1.09	0.00	0.253
2.072	0.000	1.63	1.21	0.00	0.279
2.268	0.000	1.63	1.32	0.00	0.306
2.464	0.000	1.65	1.44	0.00	0.332
2.661	0.000	1.66	1.55	0.00	0.359
2.857	0.000	1.68	1.67	0.00	0.386
3.053	0.000	1.69	1.79	0.00	0.414
3.249	0.000	1.71	1.91	0.00	0.441
3.445	0.000	1.72	2.03	0.00	0.469
3.641	0.000	1.74	2.15	0.00	0.497
3.838	0.000	1.75	2.27	0.00	0.526
4.034	0.000	1.77	2.39	0.00	0.554
4.230	0.000	1.78	2.52	0.00	0.583
4.426	0.000	1.80	2.64	0.00	0.612
4.622	0.000	1.81	2.77	0.00	0.642
4.818	0.000	1.83	2.90	0.00	0.671
5.015	0.000	1.85	3.03	0.00	0.701
5.211	0.000	1.87	3.16	0.00	0.732
5.407	0.000	1.88	3.29	0.00	0.762
5.603	0.000	1.91	3.43	0.00	0.793
5.799	0.000	1.92	3.56	0.00	0.824

5.995	0.000	1.95	3.70	0.00	0.856
6.192	0.000	1.96	3.83	0.00	0.888
6.388	0.000	1.99	3.97	0.00	0.920
6.584	0.000	2.01	4.11	0.00	0.953
6.780	0.000	2.04	4.26	0.00	0.986
6.976	0.000	2.05	4.40	0.00	1.019
7.172	0.000	2.09	4.55	0.00	1.053
7.369	0.000	2.10	4.69	0.00	1.087
7.565	0.000	2.14	4.84	0.00	1.122
7.761	0.000	2.16	4.99	0.00	1.157
7.957	0.000	2.20	5.12	0.06	1.191
8.153	0.000	2.22	5.24	0.17	1.224
8.349	0.000	2.26	5.35	0.28	1.257
8.546	0.000	2.28	5.46	0.38	1.287
8.742	0.000	2.32	5.57	0.48	1.317
8.938	0.000	2.35	5.67	0.55	1.346
9.134	0.000	2.40	5.77	0.62	1.375
9.330	0.000	2.42	5.87	0.69	1.403
9.526	0.000	2.47	5.97	0.76	1.431
9.723	0.000	2.50	6.06	0.82	1.458
9.919	0.000	2.56	6.16	0.87	1.485
10.115	0.000	2.59	6.25	0.92	1.512
10.311	0.000	2.65	6.35	0.96	1.540
10.507	0.000	2.69	6.45	1.01	1.567
10.703	0.000	2.76	6.54	1.09	1.594
10.900	0.000	2.80	6.63	1.25	1.619
11.096	0.000	2.88	6.71	1.44	1.642
11.292	0.000	2.92	6.78	1.62	1.663
11.488	0.000	3.01	6.85	1.79	1.683
11.684	0.000	3.06	6.92	1.94	1.701
11.880	0.000	3.16	6.98	2.08	1.719
12.077	0.000	3.22	7.04	2.24	1.735
12.273	0.000	3.69	7.11	2.46	1.754
12.469	0.000	3.75	7.16	2.71	1.771
12.665	0.000	3.89	7.22	2.93	1.787
12.861	0.000	3.97	7.27	3.12	1.801
13.057	0.000	4.14	7.32	3.31	1.814
13.254	0.000	4.23	7.36	3.48	1.826
13.450	0.000	4.44	7.40	3.65	1.839
13.646	0.000	4.55	7.45	3.81	1.851
13.842	0.000	4.81	7.49	3.98	1.865
14.038	0.000	4.95	7.54	4.13	1.878
14.234	0.000	4.97	7.58	4.25	1.890
14.431	0.000	5.16	7.63	4.36	1.903
14.627	0.000	5.63	7.69	4.50	1.921
14.823	0.000	5.91	7.77	4.67	1.941
15.019	0.000	6.63	7.87	4.89	1.969
15.215	0.000	7.09	7.98	5.15	2.001
15.411	0.000	8.52	8.15	5.47	2.050
15.608	0.000	10.77	8.44	5.93	2.128

15.804	0.000	14.72	8.92	6.62	2.260
16.000	0.000	19.45	9.64	7.57	2.452
16.196	0.000	46.84	12.26	9.64	3.055
16.392	0.000	12.29	12.36	11.22	3.073
16.588	0.000	7.66	12.04	11.11	3.017
16.785	0.000	6.24	11.68	10.76	2.944
16.981	0.000	5.38	11.31	10.37	2.863
17.177	0.000	5.02	10.95	9.97	2.782
17.373	0.000	4.67	10.62	9.58	2.703
17.569	0.000	4.33	10.31	9.19	2.624
17.766	0.000	4.05	10.00	8.80	2.547
17.962	0.000	3.82	9.71	8.41	2.473
18.158	0.000	3.48	9.43	8.02	2.399
18.354	0.000	3.11	9.16	7.62	2.326
18.550	0.000	2.96	8.90	7.22	2.257
18.746	0.000	2.84	8.67	6.82	2.192
18.943	0.000	2.72	8.45	6.43	2.132
19.139	0.000	2.62	8.25	6.04	2.077
19.335	0.000	2.53	8.07	5.66	2.026
19.531	0.000	2.45	7.90	5.29	1.980
19.727	0.000	2.37	7.76	4.92	1.938
19.923	0.000	2.30	7.63	4.57	1.902
20.120	0.000	2.24	7.51	4.26	1.869
20.316	0.000	2.18	7.41	3.93	1.840
20.512	0.000	2.12	7.32	3.59	1.817
20.708	0.000	2.07	7.25	3.30	1.797
20.904	0.000	2.02	7.20	3.05	1.780
21.100	0.000	1.98	7.15	2.85	1.766
21.297	0.000	1.94	7.10	2.67	1.754
21.493	0.000	1.90	7.07	2.52	1.744
21.689	0.000	1.86	7.04	2.40	1.735
21.885	0.000	1.82	7.01	2.29	1.728
22.081	0.000	1.79	6.99	2.20	1.721
22.277	0.000	1.76	6.96	2.14	1.715
22.474	0.000	1.73	6.94	2.09	1.709
22.670	0.000	1.70	6.92	2.05	1.703
22.866	0.000	1.67	6.90	2.00	1.698
23.062	0.000	1.64	6.89	1.96	1.692
23.258	0.000	1.62	6.87	1.92	1.687
23.454	0.000	1.59	6.85	1.88	1.683
23.651	0.000	1.57	6.84	1.84	1.678
23.847	0.000	1.55	6.82	1.81	1.674
24.043	0.000	1.53	6.81	1.78	1.670
24.239	0.000	0.00	6.71	1.65	1.643

Hydrograph Report

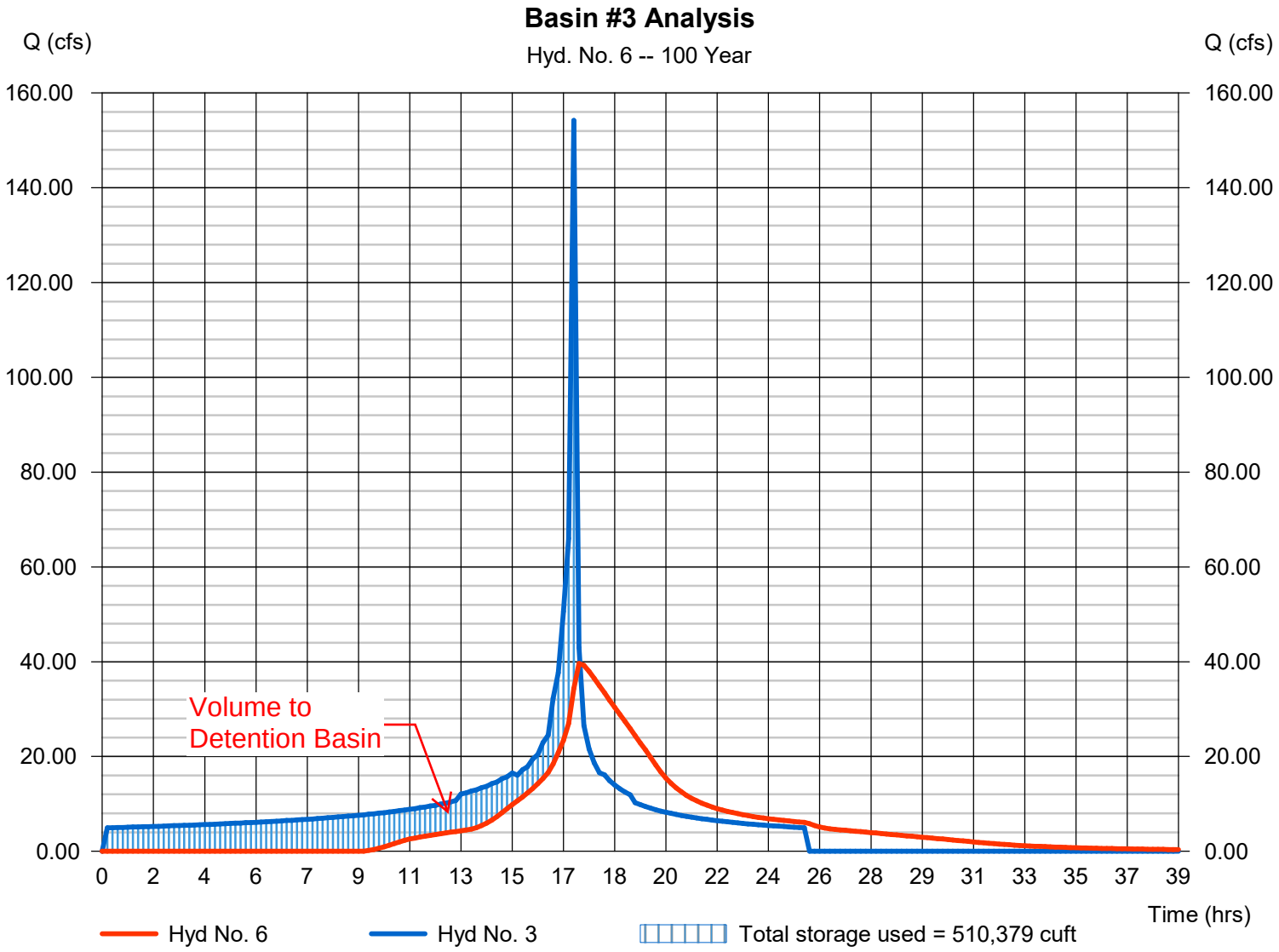
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Friday, 12 / 23 / 2022

Hyd. No. 6

Basin #3 Analysis

Hydrograph type	=	Reservoir	Peak discharge	=	39.64 cfs
Storm frequency	=	100 yrs	Time to peak	=	17.05 hrs
Time interval	=	11 min	Hyd. volume	=	821,225 cuft
Inflow hyd. No.	=	3 - Post A3	Max. Elevation	=	111.94 ft
Reservoir name	=	DA A3 - Detention Basin #3	Max. Storage	=	510,379 cuft

Storage Indication method used.



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**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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                          Analysis prepared by:

                    Kimley-Horn and Associates, Inc.
                           765 The City Drive
                               Suite 200
                            Orange, CA 92868

**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:
  PACIFIC COMMERCE CENTER
  BASIN ANALYSIS
  POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A3
--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   57.97
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.085
    LOW LOSS FRACTION = 0.123
    TIME OF CONCENTRATION(MIN.) = 10.56
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.36
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.93
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.35
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.24
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.15
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.83

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

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    22.44
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     5.72

**************************************************************************
  TIME     VOLUME       Q    0.       40.0      80.0     120.0     160.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.16      0.0359      4.94  .Q        .         .         .         .
  0.34      0.1080      4.97  .Q        .         .         .         .
```

0.51	0.1805	4.99	.Q	.	.	.	.
0.69	0.2535	5.04	.Q	.	.	.	.
0.86	0.3269	5.06	.Q	.	.	.	.
1.04	0.4008	5.10	.Q	.	.	.	.
1.22	0.4751	5.12	.Q	.	.	.	.
1.39	0.5500	5.17	.Q	.	.	.	.
1.57	0.6253	5.19	.Q	.	.	.	.
1.74	0.7012	5.24	.Q	.	.	.	.
1.92	0.7776	5.26	.Q	.	.	.	.
2.10	0.8545	5.31	.Q	.	.	.	.
2.27	0.9319	5.34	.Q	.	.	.	.
2.45	1.0099	5.39	.Q	.	.	.	.
2.62	1.0885	5.41	.Q	.	.	.	.
2.80	1.1676	5.47	.Q	.	.	.	.
2.98	1.2473	5.49	.Q	.	.	.	.
3.15	1.3276	5.55	.Q	.	.	.	.
3.33	1.4085	5.58	.Q	.	.	.	.
3.50	1.4900	5.63	.Q	.	.	.	.
3.68	1.5722	5.66	.Q	.	.	.	.
3.86	1.6550	5.72	.Q	.	.	.	.
4.03	1.7384	5.75	.Q	.	.	.	.
4.21	1.8226	5.82	.Q	.	.	.	.
4.38	1.9074	5.85	.Q	.	.	.	.
4.56	1.9930	5.91	.Q	.	.	.	.
4.74	2.0792	5.95	.Q	.	.	.	.
4.91	2.1662	6.02	.Q	.	.	.	.
5.09	2.2540	6.05	.Q	.	.	.	.
5.26	2.3426	6.12	.Q	.	.	.	.
5.44	2.4319	6.16	.Q	.	.	.	.
5.62	2.5221	6.24	.Q	.	.	.	.
5.79	2.6131	6.28	.Q	.	.	.	.
5.97	2.7050	6.36	.Q	.	.	.	.
6.14	2.7978	6.40	.Q	.	.	.	.
6.32	2.8915	6.48	.Q	.	.	.	.
6.50	2.9861	6.53	.Q	.	.	.	.
6.67	3.0816	6.62	.Q	.	.	.	.
6.85	3.1782	6.66	.Q	.	.	.	.
7.02	3.2758	6.76	.Q	.	.	.	.
7.20	3.3745	6.81	.Q	.	.	.	.
7.38	3.4742	6.91	.Q	.	.	.	.
7.55	3.5750	6.96	.Q	.	.	.	.
7.73	3.6771	7.07	.Q	.	.	.	.
7.90	3.7803	7.12	.Q	.	.	.	.
8.08	3.8847	7.24	.Q	.	.	.	.
8.26	3.9904	7.30	.Q	.	.	.	.
8.43	4.0974	7.42	.Q	.	.	.	.
8.61	4.2058	7.48	.Q	.	.	.	.
8.78	4.3156	7.62	.Q	.	.	.	.
8.96	4.4269	7.68	.Q	.	.	.	.
9.14	4.5397	7.83	.Q	.	.	.	.

9.31	4.6541	7.90	.Q . . . .
9.49	4.7701	8.06	. Q . . . .
9.66	4.8879	8.14	. Q . . . .
9.84	5.0075	8.30	. Q . . . .
10.02	5.1289	8.39	. Q . . . .
10.19	5.2523	8.57	. Q . . . .
10.37	5.3777	8.67	. Q . . . .
10.54	5.5053	8.87	. Q . . . .
10.72	5.6351	8.98	. Q . . . .
10.90	5.7672	9.20	. Q . . . .
11.07	5.9019	9.32	. Q . . . .
11.25	6.0392	9.56	. Q . . . .
11.42	6.1792	9.69	. Q . . . .
11.60	6.3222	9.97	. Q . . . .
11.78	6.4683	10.12	. Q . . . .
11.95	6.6178	10.43	. Q . . . .
12.13	6.7715	10.70	. Q . . . .
12.30	6.9373	12.11	. Q . . . .
12.48	7.1148	12.30	. Q . . . .
12.66	7.2968	12.72	. Q . . . .
12.83	7.4834	12.94	. Q . . . .
13.01	7.6752	13.43	. Q . . . .
13.18	7.8724	13.69	. Q . . . .
13.36	8.0758	14.27	. Q . . . .
13.54	8.2858	14.59	. Q . . . .
13.71	8.5032	15.30	. Q . . . .
13.89	8.7286	15.69	. Q . . . .
14.06	8.9630	16.53	. Q . . . .
14.24	9.1998	16.03	. Q . . . .
14.42	9.4414	17.18	. Q . . . .
14.59	9.6962	17.86	. Q . . . .
14.77	9.9677	19.47	. Q . . . .
14.94	10.2581	20.45	. Q . . . .
15.12	10.5736	22.93	. Q . . . .
15.30	10.9187	24.53	. Q . . . .
15.47	11.3317	32.25	. Q . . . .
15.65	11.8404	37.70	. Q. . . .
15.82	12.4827	50.62	. . Q . . .
16.00	13.3310	66.04	. . Q . . .
16.18	14.9328	154.21	. . . . Q .
16.35	16.3667	42.95	. Q . . . .
16.53	16.8718	26.50	. Q . . . .
16.70	17.2215	21.59	. Q . . . .
16.88	17.5140	18.62	. Q . . . .
17.06	17.7699	16.58	. Q . . . .
17.23	18.0077	16.12	. Q . . . .
17.41	18.2336	14.93	. Q . . . .
17.58	18.4438	13.98	. Q . . . .
17.76	18.6413	13.18	. Q . . . .
17.94	18.8281	12.50	. Q . . . .

18.11	19.0057	11.92	. Q	.	.	.	.
18.29	19.1671	10.27	. Q	.	.	.	.
18.46	19.3133	9.83	. Q	.	.	.	.
18.64	19.4534	9.44	. Q	.	.	.	.
18.82	19.5881	9.09	. Q	.	.	.	.
18.99	19.7180	8.77	. Q	.	.	.	.
19.17	19.8434	8.48	. Q	.	.	.	.
19.34	19.9649	8.22	. Q	.	.	.	.
19.52	20.0827	7.98	.Q	.	.	.	.
19.70	20.1971	7.75	.Q	.	.	.	.
19.87	20.3084	7.55	.Q	.	.	.	.
20.05	20.4168	7.36	.Q	.	.	.	.
20.22	20.5225	7.18	.Q	.	.	.	.
20.40	20.6257	7.01	.Q	.	.	.	.
20.58	20.7266	6.86	.Q	.	.	.	.
20.75	20.8253	6.71	.Q	.	.	.	.
20.93	20.9218	6.57	.Q	.	.	.	.
21.10	21.0165	6.44	.Q	.	.	.	.
21.28	21.1092	6.32	.Q	.	.	.	.
21.46	21.2003	6.20	.Q	.	.	.	.
21.63	21.2896	6.09	.Q	.	.	.	.
21.81	21.3774	5.98	.Q	.	.	.	.
21.98	21.4637	5.88	.Q	.	.	.	.
22.16	21.5485	5.78	.Q	.	.	.	.
22.34	21.6320	5.69	.Q	.	.	.	.
22.51	21.7142	5.60	.Q	.	.	.	.
22.69	21.7951	5.52	.Q	.	.	.	.
22.86	21.8748	5.44	.Q	.	.	.	.
23.04	21.9533	5.36	.Q	.	.	.	.
23.22	22.0308	5.29	.Q	.	.	.	.
23.39	22.1072	5.22	.Q	.	.	.	.
23.57	22.1825	5.15	.Q	.	.	.	.
23.74	22.2569	5.08	.Q	.	.	.	.
23.92	22.3303	5.02	.Q	.	.	.	.
24.10	22.4028	4.95	.Q	.	.	.	.
24.27	22.4388	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%	1446.7
10%	211.2
20%	63.4
30%	31.7
40%	21.1

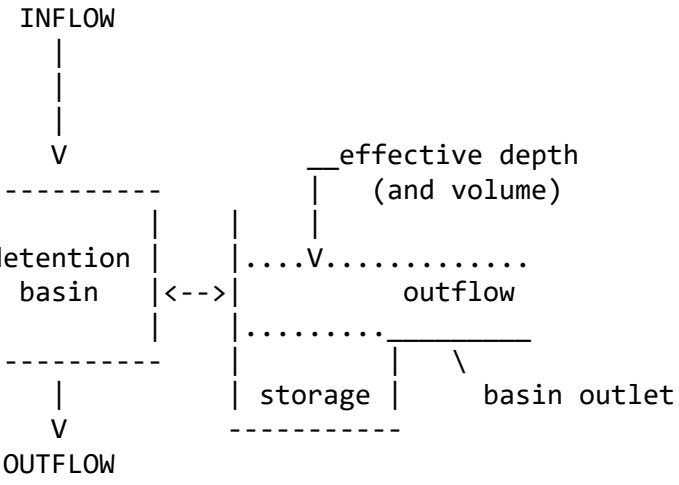
50%	10.6
60%	10.6
70%	10.6
80%	10.6
90%	10.6

Problem Descriptions:
PACIFIC COMMERCE CENTER
BASIN ANALYSIS
POST-DEVELOPMENT, 100-YEAR STORM EVENT, DA A3

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 10.560
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 18

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS) **	**BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS) *
0.000	0.000	0.000**	5.000	4.516	0.000*
5.500	5.067	0.947**	6.000	5.622	2.670*
6.500	6.180	3.781**	7.000	6.737	4.631*
7.500	7.292	6.828**	8.000	7.843	11.340*
8.500	8.387	17.090**	9.000	8.923	22.200*
9.500	9.447	26.090**	10.000	9.957	29.410*
10.500	10.448	32.370**	11.000	10.918	35.060*

```
     *     11.500     11.359     37.560**     12.000     11.762     39.890*
     *     12.500     12.101     42.090**     13.000     12.359     44.180*
-------------------------------------------------------------------------------
     BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:
      INTERVAL   DEPTH   {S-O*DT/2}   {S+O*DT/2}
       NUMBER   (FEET)   (ACRE-FEET)  (ACRE-FEET)
           1     0.00       0.00000      0.00000
           2     5.00       4.51650      4.51650
           3     5.50       5.06051      5.07429
           4     6.00       5.60308      5.64192
           5     6.50       6.15210      6.20710
           6     7.00       6.70312      6.77048
           7     7.50       7.24224      7.34156
           8     8.00       7.76033      7.92527
           9     8.50       8.26291      8.51149
          10     9.00       8.76135      9.08425
          11     9.50       9.25725      9.63675
          12    10.00       9.74281     10.17059
          13    10.50      10.21308     10.68392
          14    11.00      10.66292     11.17288
          15    11.50      11.08564     11.63196
          16    12.00      11.47139     12.05161
          17    12.50      11.79439     12.40661
          18    13.00      12.03799     12.68061
     WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)
-------------------------------------------------------------------------------
     DETENTION BASIN ROUTING RESULTS:
     NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES
           OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE
           AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

        TIME  DEAD-STORAGE  INFLOW  EFFECTIVE  OUTFLOW  EFFECTIVE
       (HRS)   FILLED(AF)    (CFS)  DEPTH(FT)   (CFS)   VOLUME(AF)
-------------------------------------------------------------------------------
       0.160        0.000     4.94      0.08     0.00      0.072
       0.336        0.000     4.97      0.16     0.00      0.144
       0.512        0.000     4.99      0.24     0.00      0.217
       0.688        0.000     5.04      0.32     0.00      0.290
       0.864        0.000     5.06      0.40     0.00      0.364
       1.040        0.000     5.10      0.48     0.00      0.438
       1.216        0.000     5.12      0.57     0.00      0.512
       1.392        0.000     5.17      0.65     0.00      0.588
       1.568        0.000     5.19      0.73     0.00      0.663
       1.744        0.000     5.24      0.82     0.00      0.739
       1.920        0.000     5.26      0.90     0.00      0.816
       2.096        0.000     5.31      0.99     0.00      0.893
       2.272        0.000     5.34      1.07     0.00      0.971
       2.448        0.000     5.39      1.16     0.00      1.049
       2.624        0.000     5.41      1.25     0.00      1.128
       2.800        0.000     5.47      1.34     0.00      1.207
```

2.976	0.000	5.49	1.43	0.00	1.287
3.152	0.000	5.55	1.51	0.00	1.368
3.328	0.000	5.58	1.60	0.00	1.449
3.504	0.000	5.63	1.69	0.00	1.531
3.680	0.000	5.66	1.79	0.00	1.613
3.856	0.000	5.72	1.88	0.00	1.697
4.032	0.000	5.75	1.97	0.00	1.780
4.208	0.000	5.82	2.06	0.00	1.865
4.384	0.000	5.85	2.16	0.00	1.950
4.560	0.000	5.91	2.25	0.00	2.036
4.736	0.000	5.95	2.35	0.00	2.122
4.912	0.000	6.02	2.45	0.00	2.210
5.088	0.000	6.05	2.54	0.00	2.298
5.264	0.000	6.12	2.64	0.00	2.387
5.440	0.000	6.16	2.74	0.00	2.477
5.616	0.000	6.24	2.84	0.00	2.567
5.792	0.000	6.28	2.94	0.00	2.659
5.968	0.000	6.36	3.05	0.00	2.751
6.144	0.000	6.40	3.15	0.00	2.844
6.320	0.000	6.48	3.25	0.00	2.939
6.496	0.000	6.53	3.36	0.00	3.034
6.672	0.000	6.62	3.46	0.00	3.130
6.848	0.000	6.66	3.57	0.00	3.227
7.024	0.000	6.76	3.68	0.00	3.325
7.200	0.000	6.81	3.79	0.00	3.424
7.376	0.000	6.91	3.90	0.00	3.524
7.552	0.000	6.96	4.01	0.00	3.626
7.728	0.000	7.07	4.13	0.00	3.728
7.904	0.000	7.12	4.24	0.00	3.832
8.080	0.000	7.24	4.36	0.00	3.937
8.256	0.000	7.30	4.48	0.00	4.043
8.432	0.000	7.42	4.60	0.00	4.151
8.608	0.000	7.48	4.72	0.00	4.260
8.784	0.000	7.62	4.84	0.00	4.371
8.960	0.000	7.68	4.96	0.00	4.483
9.136	0.000	7.83	5.07	0.07	4.596
9.312	0.000	7.90	5.17	0.23	4.707
9.488	0.000	8.06	5.27	0.42	4.818
9.664	0.000	8.14	5.37	0.61	4.928
9.840	0.000	8.30	5.47	0.80	5.037
10.016	0.000	8.39	5.57	1.04	5.144
10.192	0.000	8.57	5.66	1.35	5.249
10.368	0.000	8.67	5.76	1.67	5.351
10.544	0.000	8.87	5.85	1.98	5.451
10.720	0.000	8.98	5.93	2.29	5.548
10.896	0.000	9.20	6.02	2.58	5.645
11.072	0.000	9.32	6.10	2.81	5.739
11.248	0.000	9.56	6.19	3.00	5.835
11.424	0.000	9.69	6.28	3.19	5.929
11.600	0.000	9.97	6.36	3.38	6.025

11.776	0.000	10.12	6.45	3.57	6.120
11.952	0.000	10.43	6.53	3.75	6.218
12.128	0.000	10.70	6.62	3.91	6.316
12.304	0.000	12.11	6.73	4.08	6.433
12.480	0.000	12.30	6.83	4.26	6.550
12.656	0.000	12.72	6.94	4.44	6.670
12.832	0.000	12.94	7.05	4.69	6.791
13.008	0.000	13.43	7.16	5.08	6.912
13.184	0.000	13.69	7.26	5.56	7.030
13.360	0.000	14.27	7.37	6.03	7.150
13.536	0.000	14.59	7.48	6.50	7.268
13.712	0.000	15.30	7.59	7.17	7.386
13.888	0.000	15.69	7.69	8.06	7.497
14.064	0.000	16.53	7.79	8.96	7.607
14.240	0.000	16.03	7.87	9.78	7.698
14.416	0.000	17.18	7.96	10.55	7.795
14.592	0.000	17.86	8.04	11.39	7.889
14.768	0.000	19.47	8.14	12.37	7.992
14.944	0.000	20.45	8.23	13.46	8.094
15.120	0.000	22.93	8.34	14.63	8.215
15.296	0.000	24.53	8.46	15.93	8.340
15.472	0.000	32.25	8.65	17.63	8.552
15.648	0.000	37.70	8.90	19.90	8.811
15.824	0.000	50.62	9.28	22.76	9.217
16.000	0.000	66.04	9.84	26.36	9.794
16.176	0.000	154.21	11.74	33.50	11.549
16.352	0.000	42.95	11.81	38.84	11.609
16.528	0.000	26.50	11.59	38.50	11.435
16.704	0.000	21.59	11.33	37.34	11.205
16.880	0.000	18.62	11.04	35.97	10.953
17.056	0.000	16.58	10.76	34.51	10.692
17.232	0.000	16.12	10.50	33.06	10.446
17.408	0.000	14.93	10.25	31.62	10.203
17.584	0.000	13.98	10.01	30.18	9.967
17.760	0.000	13.18	9.79	28.74	9.741
17.936	0.000	12.50	9.58	27.30	9.526
18.112	0.000	11.92	9.38	25.88	9.322
18.288	0.000	10.27	9.19	24.40	9.117
18.464	0.000	9.83	9.00	22.93	8.926
18.640	0.000	9.44	8.84	21.40	8.752
18.816	0.000	9.09	8.69	19.83	8.596
18.992	0.000	8.77	8.56	18.41	8.456
19.168	0.000	8.48	8.45	17.12	8.330
19.344	0.000	8.22	8.35	15.90	8.218
19.520	0.000	7.98	8.25	14.79	8.119
19.696	0.000	7.75	8.17	13.80	8.032
19.872	0.000	7.55	8.10	12.92	7.953
20.048	0.000	7.36	8.04	12.14	7.884
20.224	0.000	7.18	7.98	11.47	7.821
20.400	0.000	7.01	7.93	10.93	7.764

20.576	0.000	6.86	7.88	10.48	7.712
20.752	0.000	6.71	7.84	10.07	7.663
20.928	0.000	6.57	7.80	9.68	7.618
21.104	0.000	6.44	7.76	9.32	7.576
21.280	0.000	6.32	7.72	8.99	7.537
21.456	0.000	6.20	7.69	8.69	7.501
21.632	0.000	6.09	7.66	8.40	7.467
21.808	0.000	5.98	7.63	8.13	7.436
21.984	0.000	5.88	7.60	7.89	7.407
22.160	0.000	5.78	7.58	7.66	7.379
22.336	0.000	5.69	7.56	7.44	7.354
22.512	0.000	5.60	7.53	7.24	7.330
22.688	0.000	5.52	7.51	7.05	7.308
22.864	0.000	5.44	7.50	6.88	7.287
23.040	0.000	5.36	7.48	6.77	7.266
23.216	0.000	5.29	7.46	6.69	7.246
23.392	0.000	5.22	7.44	6.61	7.226
23.568	0.000	5.15	7.42	6.53	7.206
23.744	0.000	5.08	7.40	6.45	7.186
23.920	0.000	5.02	7.39	6.37	7.166
24.096	0.000	4.95	7.37	6.29	7.147
24.272	0.000	0.00	7.29	6.08	7.058

Appendix K

Hydraulic Analysis
(To be prepared in Final Engineering)